



Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
7	1/8/1995	CSXT	CTC			Train PO8308	None	Richmond, VA	N
<p>Cause</p> <p>Narrative</p> <p>Scenario Reenacted, Unable to Duplicate, No Defects Found</p> <p>On January 8, 1995, Train PO 8308 reported he has a SLOW CLEAR indication from #4 Track to #3 Track at Hillard Road for southbound movement. This signal was not requested at this time; however, northbound signal for #3 Track was, and was indicating.</p> <p>Signal personnel investigated the incident making all required operational tests. The incident could not be duplicated. It was determined that signal system was functioning as intended, and signal system was restored to service.</p>									
449	1/11/1995	SP	CTC			01CICHX-10	Signal 50RA	Akela, New Mexico	N
<p>Failed Equipment or Device - Semaphore Signal</p> <p>On January 11, 1995 at approximately 11:10 PM Engineer operating train no. 01 CICHX-10 traveling east, reported that signal 50RA at West Akela was Green and the next signal 52RA was Red. Signal 50RA should have been Yellow.</p> <p>Under the direction of the Signal Maintainer, the signal system was immediately removed from service and thoroughly tested. It was found that the report made was true. Upon further investigation, it was found that a broken eyelet in the negative armature circuit in the eastbound signal 52RA caused that circuit to remain open and signal 52RA to remain Red regardless of the position of the controlling relays.</p> <p>The defect was corrected. The signal system was thoroughly tested and found to be working as intended. The system was restored to service on January 12, 1995 at 3:00 AM.</p>									

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21	1/12/1995	NS	CTC			8031	Track Circuit	Devon, WV	N
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Loss of Shunt - Possible Rust or Foreign Material on Rail

At approximately 8:00AM, train No. 946U1 was shoving a caboose and four (4) cars eastbound from #2 Storage Track onto the Buchanan Branch at Devon. The move was governed by dwarf signal 4L which displayed a SLOW APPROACH aspect. The move was stopped with three (3) cars past the 4L signal and inside the "OS" at Devon, in order to make a reverse movement. It was noticed by the train crew that 4L signal was still displaying SLOW APPROACH. Once the reverse movement started, 4L signal went to a STOP aspect.

Investigation by signal personnel showed that a 0.06 ohm shunt, when applied at the base of the rail in the "OS" track circuit would drop the "OS" track relay. However, when held to the top of the rail, the shunting was erratic. There were signs of rust on the wheels in this area. Further investigation led to the determination that rust on the top of the rail in #2 Storage Track had built up on the wheels of the cars being shoved, and that, along with the rust already on the "OS" rails, caused loss of shunt. A cut of cars was shoved back onto the "OS" to verify this finding. Intermittent shunting was evident on this cut, also. A car with brake applied was pulled over the affected tracks to clear the rust to the point where shunting was reliable.

Ground tests were performed and proper track relay current was verified. No other discrepancies were found, and the signal system was returned to service.

8	1/17/1995	CSXT	CTC			Train F767-17	Signal 269	Lilesville, NC	N
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Failed Equipment or Device - Relay

On January 17, 1995, Train F767-17 reported APPROACH MEDIUM signal at M.P. SF-269. This signal or route was not intended by CSXT due to the signal in advance being a control signal and at STOP.

Signal system was removed from service. Signal personnel, along with FRA personnel investigated the incident making all operational tests. The incident could not be duplicated. It was determined that the signal system was functioning as intended. Signal system is restored to service.

(Handwritten notes on bottom of form: "CD Relay failing - pitted contacts")

37	1/20/1995	UP	CTC			NLNP-18	None	Darr, Nebraska	N
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Loss of Shunt - Possible Rust or Foreign Material on Rail

On January 20, 1995, at 15:53 (CDT) westbound NLNP-18 on the Council Bluffs Subdivision was stopped on Track 1 at Control Point B233 with westbound LND-15 occupying Track 1 west of the control point. NLNP-18 reported signal 1W went from Red to Green about four times in 5-second durations.

An investigation could not duplicate the occurrence, and it was determined that loss of shunt by LND-15, a single 4-axle locomotive, had caused the signal display.

All applicable tests were performed.

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22	1/24/1995	NS	CTC			5158	Foreign Current	Corinth (Blanchet), KY	N
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Cause
Narrative

Train No. 388 was stopped on Track #2 at Blanchet waiting on Train No. 108 to clear the block ahead. Meanwhile, Train No. 108 was running northbound, Track #2, on an APPROACH indication waiting for two southbounds to clear the single track ahead. The dispatcher had requested the northward signal for No. 388 at Blanchet so that it would come in once No. 108 could get a signal and clear the block. The crew on No. 388 reported observing that the signal at Blanchet displayed an APPROACH indication for about six (6) seconds and then went back to a STOP. At this point in time the crew knew that No. 108 was still in the block ahead and reported the false proceed signal they had observed.

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

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

23	1/25/1995	NS	CTC			2540	Design	New Bohemia (Poe), VA	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

Train No. 821, traveling westbound on the Eastbound Main reported a CLEAR signal indication at Milepost N-73.5 and then encountered a RESTRICTED indication at Milepost N-75.7.

Signal personnel investigated and determined that the RESTRICTED signal was due to a line wire wrap at Milepost N-77.1 which shorted out the coils of the ZTPA relay at the N-75.7 signal. A design deficiency was responsible for fact that the singular failure of the ZTPA relay did not result in an HD pole change to the signal at Milepost N-73.5.

The problem was corrected by circuit changes and by correcting the line wrap condition.

450	1/26/1995	ATSF	CTC			N/A	Relay	Kansas City, KS	N
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Failed Equipment or Device - Relay

At approximately 8:45PM, January 26, 1995 dispatcher reported signal 2W at CP 148 had cleared without being requested. Signal Department investigated the reported incident and determined the 2WBHR relay failed to de-energize allowing signal 2W to reclear after the train passed 2W signal. The 2WBHR relay was removed from service and signal system tested to verify proper operation. Defective relay has been taken to Topeka for further testing to determine cause of failure.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
451	1/27/1995	CR	AB			Engine 3521	Signal 2082E	Winchester, Indiana	N	
			Failed Equipment or Device - Relay							
			Engineer on train NLP17 reported that signal 2082E displayed STOP AND PROCEED with train ML 460 ahead in the block. After ML460 cleared block of 2082E, signal displayed CLEAR aspect instead of APPROACH. Cause was found to be defective 2082EDHR relay, due to polar armature failing to move to the reverse position account frozen in normal position. Relay removed from service, signal system tested, and placed back in service.							
24	1/29/1995	NS	AB			8575	Track Circuit	Ford, VA	N	
			Loss of Shunt - Possible Rust or Foreign Material on Rail							
			Train No. 235 had lead unit 8575 fail with a wheel slip alarm. The train was stopped and the rest of the units were used to move the train to the adjacent track. Mechanical shop employees then attempted to move the stalled engine which was by that time alone in the block. The protecting signal was being observed by Trainmaster and the crew of No. 235, and they noticed that it was flopping between a STOP and CLEAR indication while the attempt was being made to move the engine.							
			Signal personnel were called to investigate, and by the time they arrived, engine 8575 had been moved to a spur track. It was found that the track relay, a 2 ohm, 4 point, DN-11, could be shunted with a 0.06 ohm shunt at either end and at the point where the engine was being operated at the time the false clear was observed. The track relay was tested and found to be in spec. The Mechanical forces were questioned about the operation and condition of engine 8575, and they said it had been leaking grease profusely to the rail. Due to this grease and the icy conditions, they had operated the sanders while attempting to move the engine. The condition was duplicated as closely as possible with the engine heavily sanding the rail and loss of shunt did occur. The cause was determined to be the grease/sand combination on the rails that resulted in the intermittent loss of shunt.							
			Once the rails were determined to be sufficiently clean of the grease, the signals were fully returned to service.							
452	2/5/1995	SP	CTC			BN 063	Signal 2H	Utah Jct., CO	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			On February 5, 1995 at approximately 10:56 PM, Engineer operating train no. BN 063 traveling east, reported that signal 2H at Utah Jct. was CLEAR when it should have been Red.							
			Under the direction of the Signal Supervisor, the signal system was immediately removed from service and thoroughly tested. All tests showed the signal system to be working as intended with no exceptions. The Digicon system showed that signal had not been requested by the dispatcher and was not CLEAR.							
			The signal system was restored to service on February 6, 1995 at 5:10 AM.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
9	2/6/1995	CSXT	AB				Signal 122.3	Social Circle, GA	N
<p>Cause</p> <p>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</p> <p>On February 6, 1995, Signal Maintainer was dispatched to signal trouble at M.P. YYG-122.3. Upon investigation, he determined that the home signal at M.P. YYG-120.1 displayed a CLEAR indication while the intermediate signal in advance (122.3) displayed a Red indication. Signal system was removed from service. Upon further investigation, it was discovered that the signal control wires were wrapped, causing improper polarity to be applied to control relay.</p> <p>Control wires were unwrapped, and situation corrected. Operational test was performed; and signal system was returned to service.</p>									
453	2/8/1995	SP	AB			1CHSXF-06 West	Signal 15329	Vaughn/Leoncito, NM	N
<p>Failed Equipment or Device - Semaphore Signal</p> <p>On February 8, 1995 at approximately 1:00 AM Engineer operating train 1CHSXF-06 traveling west, reported that signal 15329 was Green and the next signal 15319 was Red.</p> <p>Under the direction of the Signal Supervisor, the signal system was placed at STOP. Signal personnel inspected the signal system and found that the motor brushes and commutator at signal 15319 were covered with carbon thus preventing the proper operation of the semaphore blade.</p> <p>After the motor brushes and commutator were cleaned, the signal system was thoroughly tested and found to be working as intended with no exceptions.</p> <p>The signal system was restored to service on February 8, 1995 at 3:30 AM.</p>									
459	2/9/1995	CR	CTC			Train ML420, Engin	Signal 254S	Northlumberland, PA	N
<p>Human Error - Signal Circuit Design Error, Inadequate Service-Testing</p> <p>Engineer on train ML420 reported that signal 254S displayed APPROACH. The aspect then upgraded to APPROACH MEDIUM several times before passing the signal with 76L signal at Norry at STOP. Cause was due to contact bounce of the 76LBR relay. 76LBFR relay was removed from service, circuit design corrected, signal system tested and returned to service.</p>									
10	2/12/1995	CSXT	CTC			Train Q67611	None	Atlanta, GA	N
<p>Scenario Reenacted, Unable to Duplicate, No Defects Found</p> <p>On February 12, 1995, Train Q67611 alleged having Lunar over Red indication at signal 10 at top of slide, and then to Dark over Red, this route was not requested at this time. Signal system was removed from service.</p> <p>Signal person performed all required operational tests. It was determined that signal system was functioning as intended. Signal system is restored to service.</p>									

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			Cause						
			Narrative						

454 2/12/1995 NICD APB 2009 Track Circuit Porter, IN N

Foreign Current Induced in Track Circuit from Adjacent Power Lines

At 1:46 P.M., Sunday, February 12, 1995 a false proceed indication was displayed at eastbound home signal number 481, a head block signal at the east end of the Wilson passing track, milepost 47.46.

An APB system with continuously-lighted, three-aspect wayside colorlight signals is in place in the area in question. Trains operate by timetable and train order authority. The maximum authorized passenger train speed for this area is 79 mph. The maximum authorized freight train speed is 35 mph. A local speed restriction of 40 mph applies to the diverging route.

Extra train #2009 East, an eastbound freight train with two engines and 21 empty gondolas was in the clear awaiting a meet at the east end of the Wilson passing track per train order #21, dated 2/12/95. Scheduled passenger train #508, a two-car consist, was proceeding westward toward the meet location per train order #22, dated 2/12/95. See figure 1.

Train 2009 East observed absolute signal #481 display a STOP indication at the time it was expected that train 508 passed the opposing head block signal. Signal 481 continued to display a STOP indication as train 508 proceeded westward. As train 508 came into the view of train 2009 East, the indication of signal 481 changed from STOP to PROCEED and remained thus until train 508 proceeded through the turnout when signal 481 again displayed a STOP indication. Signal 481 then recleared as train 508 left the fouling circuit. The crew of train 508 did not report any unusual signal aspects. Train 2009 East, however, reported the false proceed aspect to the dispatcher.

The signal supervisor and a signal maintainer were immediately notified of the false proceed report. Upon inspection of the track circuit in the area in question, the north rail of the main track was found broken at approximately the same location where train 508 was observed when signal 481 was reported to have falsely cleared. When the track circuit was tested, it was discovered that the track relay would release when a 0.06-ohm test shunt was applied to the east of the rail break but that the track relay was unaffected by a test shunt applied west of the rail break. Track crews repaired the broken rail while signal department personnel continued to inspect the track circuit.

Because NITCD passenger trains are electrically propelled via a 1,500 VDC catenary system, AC vane relays and track transformers are employed as track devices for train detection. Since the track relay is located at the east end of the track circuit, it was determined that a foreign source of alternating current must have been energizing the track relay when shunts were placed west of the rail break. Initially, all adjacent track circuits were deenergized to determine if the problem was a result of insulated joint failure. Subsequently, the phase angle (instantaneous polarity) of all adjacent track circuits was tested to assure that adjacent circuits were 180 degrees out of phase and therefore could not falsely energize 472TR, the relay in question.

To determine if the foreign source of AC energy was from another NICTD AC supply, all NICTD controlled AC circuits were deenergized simultaneously from milepost 44.0 to milepost 52.8 by deenergizing the local 2,300 VAC primary system. Track relay 472, however, remained energized under these conditions. It was discovered, however, that the track relay would release when the impedance bond neutral tap was removed at the west end of track circuit 472.

The area surrounding track circuit 472 is primarily used by heavy industry with many sources of alternating current present. It is quite possible that the foreign source of alternating current is the result of differences in ground potential over several thousand feet. This can result in foreign current being developed on NITCD's running rails and can potentially develop voltage between the neutral tap and one rail connection of an impedance bond. This has the net effect of

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Cause									
Narrative									

developing an AC voltage parallel to the track relay. See figure 2.

As NITCD cannot possibly locate sources of AC grounds other than those on its own supply, it was found necessary to develop a means whereby the effects of foreign AC sources would be negated. To this end, a cut section was installed to shorten track circuit 472. This arrangement presents a higher impedance to a foreign source of energy than does a single, longer track circuit. Furthermore, an adjustment procedure was developed to raise the release value of track relay 472 and cut section track relay A472 to a value more than twice that of the foreign voltage.

Shunt tests and applicable block signal tests were performed upon completion of the modifications to track circuit 472.

25	2/12/1995	NS		Remote		4144	Signal	Chicago, IL	N
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Phantom Signal - Due to Sun Angle

At approximately 5:30PM, Train No. LC29 was prepared to head off the Pullman Branch eastbound through Pullman Junction. Signal 16RF was the governing signal for this move, and the crew reported they observed it displaying SLOW APPROACH (Yellow over Red for this dwarf signal). The engineer proceeded on this signal indication into the plant at Pullman Junction, but stopped the move when he and the conductor observed the power switches were lined against the move. The move was stopped short of any switch. After reporting the incident to the operator at Cummings, the train received permission to make a reverse movement on the Pullman Branch to where they cleared the "OS." The operator had stated that he had never lined the signal for LC29's move. Once they cleared the "OS," the crew still observed the same signal aspect displayed on 16RF. They got off the engine and shaded the signal and observed that the signal was displaying STOP (a single Red).

Signal personnel were called to investigate. On arrival, the signal was properly displaying a STOP indication, however the sun had begun to set and was not affecting the signal. Other operational tests were performed with no exceptions taken. The signal was taken out of service until the phantom signal situation could be investigated with proper sunlight conditions.

The following day a complete locking test was performed at Pullman Junction along with ground tests and applicable meggering and relay tests. Again, no exceptions were found. With sunny conditions available, sight tests were performed between 5:00 PM and 6:00 PM and the presence of a phantom aspect was confirmed. 16RF is a 2 position colorlight dwarf signal designed to display a STOP or RESTRICTING aspect (Yellow on top, Red on bottom). The sun was shining directly into the signal and made it appear to display Yellow over Red when only the red unit was energized. It took the installation of three (3) phankill devices to remove the phantom aspect. The signal was returned to service in that condition.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
455	2/15/1995	SP	CTC			1LAPCX1-14	Signal 1620	Richvale, CA	N
<p>Cause</p> <p>Narrative</p> <p>Scenario Reenacted, Unable to Duplicate, No Defects Found</p> <p>On February 15, 1995 at approximately 2:00 PM, Engineer operating train no. 1LAPCX1-14 traveling east, reported that signal 1600 displayed a Green aspect and signal 1620 displayed a Flashing Yellow for 15 or 20 seconds before it turned hard Yellow. The next signal ahead 1652 displayed Red.</p> <p>Under the direction of the Signal Engineer, the signal system was removed from service and thoroughly tested. The data from the recorder module at signal 1620 was also reviewed. The tests and the data from the recorder both indicated that the signal system was working as intended with no exceptions.</p> <p>The signal system was restored to service on February 15, 1995 at 5:45 PM.</p>									
456	2/16/1995	CR	CTC			Train HLP21B, Engi	Signal 113N	Keating Summit, PA	N
<p>Failed Equipment or Device - Relay</p> <p>Engineer on HLP 21B observed an APPROACH aspect on signal 113N with HBBU-6 occupying the block. Cause was large metal build up on contacts 16/17 of the 1NTR relay, which allowed false energy on the 1NTFP circuit. Metal build up was caused by diode which was shorted, across coils of 1NTFPR relay. Shorted diode and iNTR relay removed from service and replaced. Signal system was tested and placed back in service.</p>									
458	2/17/1995	CP	CTC			8654	RTR	Signal 139.2	N
<p>Maintenance - Improper Adjustment, Track Circuit</p> <p>On February 17, 1995 at approximately 1630 CNW south bound train no. 8654 was located at south end of siding Farmington and reported signal 28R at the Farmington holding signals had cleared from Red to Yellow to Green for about 15 seconds and returned to Red while CNW southbound train 8018 was in 2nd block ahead.</p> <p>Upon investigation, it was determined when CNW train 8018 had passed signal 139-2, the directional stick relay had picked to allow a clearing code to generate to the rear causing signal 28R to display an APPROACH aspect and immediately after passing signal 139-2, the train lost shunt allowing a clearing code to be generated back to signal 28R causing signal 28R to display a CLEAR aspect for about 15 seconds. Possible cause found to be RT track circuit was not adjusted properly causing track circuit to pick up momentarily under the train.</p> <p>Corrective Action: All track circuits between Rosemount and Comus will be inspected for adjustment and assure shunting with .06 ohm shunt.</p>									

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			Cause							
			Narrative							
457	2/17/1995	SP	CTC			ASBTQ K16	Signal 2281	Stuttgart, AR	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			On February 17, 1995 at approximately 7:27 PM, Engineer operating train no. ASBTQ K16 traveling west, reported that signal 2281 went from Yellow to Yellow over Yellow while home signal at east end of Stuttgart was Red.							
			The Signal Department was notified on February 22, 1995 at 2:30 PM. Under the direction of the Signal Supervisor, the signal system was immediately removed from service and thoroughly tested. Tests could not reproduce the problem and showed the signal system to be working as intended with no exceptions. However, as a purely precautionary measure, the coded line overlay equipment (CAO) which controlled the bottom head was replaced by a double wire double break line circuit.							
			The signal system was restored to service on February 22, 1995 at 8:30 PM.							
460	2/20/1995	SP	CTC			1DVROM 20	Signal 6767W	Rio Xover, CO	N	
			Phantom Signal - Due to Object in Foreground or Background							
			On February 20, 1995 at approximately 10:25 PM, Engineer operating train no. 1DVROM 20 traveling west, reported that he had a Yellow at signal 6745W approaching Rio and the next signal 6767W at Rio initially appeared to be Green, but as they came around the curve and observed the signal from a different angle, they saw it was Red over Red as intended.							
			Under the direction of the Signal Maintainer, the signal system was removed from service and thoroughly tested. The train crew was also interviewed. Tests showed the signal system to be working as intended with no exceptions. However, it was revealed that a yard light at Rio which was recently restored to service could be mistaken for a Green signal aspect when viewed from a certain location.							
			The light in question was turned off to eliminate the problem. The next day, the light cover was painted to keep crews from seeing it.							
			The signal system was restored to service on February 21, 1995 at 4:05 AM.							
462	2/21/1995	ATSF	CTC			829	Relay	Winslow, AZ	N	
			Vandalism - Instrument Case, Cable, or Junction Box Damaged							
			Approximately 4:20PM, February 21, 1995 train crew on the H-KCBA1-20 reported westbound intermediate signal 2861 displayed Green over Green aspect for their train as they were departing Winslow. Signal Department was notified and on arrival found signal 2861 displaying a Yellow over Green aspect with the next westbound signal at West Winslow Red. The investigation determined that a vehicle had hit the signal instrument house causing the 1ALGR relay to lay on its side allowing the 2861 signal to display Yellow over Green instead of Yellow. The relay was returned to its normal position and the signal system was tested to prove proper operation.							

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11	2/21/1995	CSXT	CTC			Train R322-21	None	Plymouth Road, MI	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

On February 21, 1995, at 1:15 p.m., Train R 322-21 reported they had a CLEAR indication on eastward absolute signal at Plymouth Road, and a STOP indication at the intermediate in advance, with train ahead in block. This route was not requested.

Signal system was removed from service. Signal personnel performed all operational tests. Incident could not be duplicated. Signal system was determined to be functioning as intended, and signal system returned to service.

461	2/21/1995	SP	CTC			1ASROM1 17	Signal 2963R	West Belden, CO	N
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Phantom Signal - Due to Sun Angle

On February 21, 1995 at approximately 12:25 PM, Engineer operating train no. 1ASROM1 17 traveling west, reported that they had a Flashing Yellow on signal 2921 and a Yellow on signal 2945 at East Belden, but found that the repeater signal 2963R at West Belden was dark. The crew was unable to stop the train and ran through the west switch at Belden which was lined reverse.

Under the direction of the Signal Engineer, the signal system was immediately removed from service for repairs to the power switch and thorough testing. Test showed that signal 2963 was dark due to a burnt out lamp, the 2963R was Flashing Red, the 2945 at East Belden was Yellow and the 2921 was Flashing Yellow. All tests showed the signal system to be working properly with the exception of the burnt out lamp. However, the next day we found that the sun was washing out the Flashing Red aspect on signal 2963R, so the lenses were replaced, the signal was realigned, and a sun shield (or sunhood) was installed to block the sun off the colorlight signal.

The signal system was returned to service on February 21, 1995 at 6:45 PM.

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463	3/1/1995	SP	CTC			1EUC1Q-K28	Signal 3111	E. Sims, CA	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

On March 1, 1995 at approximately 12:53 PM, Engineer operating train no. 1EUC1Q-K28 traveling west, reported that signal 3111 at East Sims displayed Red over Yellow; the correct aspect under the existing conditions should have been Red over Dark.

Under the direction of the Signal Supervisor, the signal system was placed at STOP. Signal personnel inspected the system and found that the improper aspect was caused by a line wire wrap which occurred during a heavy rain storm. Tests showed that the slide fence repeater relay failed to slot the 3111B head thus causing signal 3111 to display Red over Yellow.

The wrapped line wire was cleared, and the circuit was corrected to slot the head of signal 3111B thru the slide fence repeater. The signal system was tested and found to be working as intended with no exceptions.

The signal system was restored to service on March 1, 1995 at 2:00 PM.

464	3/2/1995	AMTK		Remote		3837	Signal 10R	San Francisco, CA	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On March 2, 1995 the C&S Department in San Jose, CA was notified of a non conforming signal on the 10R signal at Portrero Interlocking in San Francisco, CA. The report stated that the engineman of Southern Pacific 3837 received a Yellow over Dark (APPROACH) in lieu of a Red over Green (DIVERGING CLEAR) when he made a diverging move over number eleven switch reverse at Portrero Interlocking. Investigation revealed that the original 1959 signal design by Southern Pacific allowed movement against current of traffic on number one track without checking the position of the switches permitting movement against current of traffic. This permitted an APPROACH aspect to be displayed with number eleven switch reverse in lieu of a diverging signal. The circuit has been disabled pending redesign, and all aspects have been checked and the signal system now functions properly.

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			Cause							
			Narrative							
26	3/4/1995	NS	CTC			6598	Human Error	Stockbridge, GA	N	
			Human Error - Signal Personnel Introduced False Energy into Signal System During Testing							
			Train No. 230 was northbound at Milepost 169.811, the first intermediate signal north of Stockbridge control point, where they observed a CLEAR signal indication. Aware of the presence of another northbound train in the block ahead, they contacted the dispatcher and were instructed to take the 169.8H signal as displaying RESTRICTED PROCEED. The next signal, intermediate 166.8H, was displaying RESTRICTED PROCEED when they came in sight of it. The train ahead, No. 140, had been in the block just past this signal when No. 230 observed the CLEAR indication at 169.8H.							
			Signal personnel were in the process of repairing a severely vandalized signal bungalow at Pless, Milepost 164.5H. Because of damage to the signal system at Pless, northward signals were not available leaving the next control point south (Stockbridge). To expedite train movements, signal personnel were stationed at the 166.8 signal with an ElectroCode test set temporarily feeding signal codes into the location as if they were coming in from Pless. Through a lack of communication, the temporary arrangement was configured to give false proceed indications to northbound trains. The temporary arrangement was removed and the signal system returned to normal service after testing as required following the restoration of Pless bungalow.							
465	3/10/1995	SP	AB			1CHLBT1-07	Signal 15329	Vaughn/Leoncito, NM	N	
			Failed Equipment or Device - Semaphore Signal							
			On March 10, 1995 at approximately 3:00 AM, Engineer operating train 1CHLBT1-07 traveling west, reported that signal 15329 was Green and the next signal 15319 was Red for no apparent reason, with no train in the block.							
			The Signal Maintainer investigated and found that the single arm semaphore signal 15329 was Green but the single arm semaphore signal 15319 was Red due to a defective motor. He made repairs and tested signals, and returned signals to service at 9 AM on March 10, 1995. Signal 15319 was converted to a colorlight signal on March 16, 1995 to prevent any future reoccurrence.							
			(NOTE: Signal 15319 had also experienced a similar failure on February 8, 1995)							
466	3/11/1995	ATSF	CTC			79	Trap Ckt	Kansas City, MO	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			Approximately 9:30 PM, March 11, 1995, Traffic Control Operator tried to clear westbound signal (54R) BN crossing over the 63 switch reverse. Then stacked a route to clear the eastbound signal (54LA) over the 63 switch normal. Signal (54R) would not clear and the GWRR switch engine was authorized to flag the Red (54R) signal. While the GWRR switch engine was flagging over dead section of the BN crossing frog, the 63 switch moved to normal position. Investigation by Signal Department determined the 53 trap circuit is not effective unless signal is cleared over the crossing frog dead section. As a temporary measure of protection, instructions were issued to the Traffic Control Operators to provide manual protection for similar type switching moves until circuit design changes can be installed that will provide route locking over the crossing frog regardless of position of the control signal.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
467	3/12/1995	ATSF	CTC			876	Circuit Design Error	Barstow, CA	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			Approximately 10:20AM, March 12, 1995, train crew on the S-LB NY5-11 reported eastbound control signal (2RA) West D yard was Green and next signal eastbound control signal (2RA) East D yard was Red. Signal Department was notified of condition reported and since all information of routes that were established at time of reported incident was not made available to the investigating team, the first effort to find reported problem was inconclusive. Further review of circuit plans and with additional information of exact routes established at reported time of incident, the reported signal condition was reproduced. Investigation revealed that a circuit design error was the cause of the reported incident. Recent circuit design change to provide compliance with FRA Rule 236.23 created the false proceed signal condition. Normal in service testing would not detect this condition, because it involved a route not under test. Circuit design error was corrected and signal system was tested to prove proper operation.							
469	3/14/1995	ATSF	CTC			5156	None	Bandini, CA	N	
			Phantom Signal - Due to Sun Angle							
			Approximately 8:45AM, March 14, 1995, crew on the M-BALA1-12 reported their train was sitting on North track waiting for eastbound train that was crossing over from North track to South track and observed the westbound control signal (4L) was changing from Red to Yellow and Red to White while the eastbound train was passing under the signal bridge where the (4L) signal is mounted. Signal Department was notified and made inspection and operational test of signal system in question. All signal tests concluded signal system operating properly. The signal supervisor interviewed the conductor on the M-BALA1-13 train, conductor stated the signal aspects appeared to be more like a reflection or phantom signal condition than a true signal aspect. As a temporary preventative measure the clear outer signal lense were removed from both westbound signals until non-reflective outer lenses are received from the supplier. This is being reported as a phantom signal incident.							
468	3/14/1995	PATH	AB				Signal 500	Tunnel D, Jersey City, NJ	N	
			Human Error - Improper Circuit Jumper in Place							
			A CLEAR signal was displayed at signal 500 before 502T was occupied long enough to guarantee safe train speed. No block protection or other safety features of the signal were compromised.							
			An unwired relay contact was found bridging 5H-5B of 502TP, falsely applying energy to the 502TER relay. The contact was moved and circuits and systems in the area were tested. Signals were found operating as designed. The two employees most recently in the room (February 7, 1995) were interviewed. While no guilt can be positively established, procedures for energizing relays during testing and maintenance were reviewed with these employees.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
38	3/14/1995	UP	APB			UP3148	Switch Circuit Controller	Amelia, Texas	N
<p>Cause</p> <p>Narrative</p> <p>Maintenance - Switch Circuit Controller</p> <p>On March 14, 1995, at 15:00 (CDT), eastbound UP3148 on the Beaumont Subdivision observed eastbound Signal H450 Green with west end of Amelia Yard lined against them.</p> <p>An investigation revealed the switch circuit controller connecting rod had fallen off due to worn threads in the socket assembly.</p> <p>The socket assembly was replaced on the switch rod, and a switch inspection was done. The signal system was restored to proper operation.</p>									
470	3/21/1995	WC	AB				Signal 161R	Junction City, Wisconsin	N
<p>Scenario Reenacted, Unable to Duplicate, No Defects Found</p> <p>Signal 161R reported CLEAR for 5 to 7 seconds with train occupying block. Unable to duplicate or find any cause.</p>									
12	3/23/1995	CSXT	CTC			Train P24923	None	Baltimore, MD	N
<p>Scenario Reenacted, Unable to Duplicate, No Defects Found</p> <p>On March 23, 1995, at 8:16 a.m., westbound passenger train P24923 reported westbound signal off Mare Lead No. 22 went from LIMITED CLEAR to LIMITED APPROACH; signal should not have gone to LIMITED CLEAR.</p> <p>Signal system was removed from service. Signal personnel performed all operational tests and incident could not be duplicated. Signal system was determined to be functioning as intended; and signal system has been returned to service.</p>									
471	3/27/1995	CNW	AB			SPMPA 6850	143ATR	Peoria, IL	N
<p>Vandalism - Instrument Case, Cable, or Junction Box Damaged</p> <p>On 3/27/95 at approximately 1500 hrs. SPMPA reported southbound signal #143 Green with cars parked in the block south of the signal.</p> <p>Investigation revealed that vandals had attempted to knock over an instrument case at MP 72.8 by rocking it back and forth. The track relay and others were dislodged from their trays and tipped over as a result. This prevented the signal from going to Red. A report (95-9341) was filed with the Peoria Police Dept.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
13	4/2/1995	CSXT	CTC			Train Y20502	None	Plymouth, MI	N
			Scenario Reenacted, Unable to Duplicate, No Defects Found						
			On April 2, 1995, Train Y20502 reported they had a SLOW APPROACH at the eastward absolute signal at the Toldeo Wye with switch lined against their movement.						
			Signal system was removed from service. Signal personnel performed all operational tests. Incident could not be duplicated. Signal system was determined to be functioning as intended and returned to service.						
472	4/3/1995	KCS	AB			????	????	Shreveport, LA	N
			Scenario Reenacted, Unable to Duplicate, No Defects Found						
			Mr. David Green (FRA OP) reported that a trainmen had reported that signal no. 5549 at MP-554.95, Shreveport Subdivision, was Yellow with some carssetting beyond the signal. Time, date, engineer, train number or consist are unavailable. All applicable tests were performed at said location and condition could not be reproduced. The following individuals were involved in the testing of the system: Signal Supervisor, Signal Inspector, Signal Maintainer, and FRA Inspector.						
			See attached list of some of the tests performed.						
473	4/5/1995	ATSF	AB			3850	Wiring Error	Athos, AZ	N
			Human Error - Field Wiring Error, Inadequate Service Testing						
			Approximately 6:20AM, April 5, 1995, crew on the Q-R1AL1-03 reported as they were on the Athos siding approaching the leave siding signal at the east end of Athos to wait for Amtrak No. 4 to pass on the south main track, the leave siding signal displayed a Green aspect. Signal Department personnel were notified and their investigation of the reported incident verified the condition as reported. Further investigation determined that a wiring error had been made while changing a two-point relay to a four-point relay the day before and proper tests were not conducted to prove correct operation of the signal system. The wiring error was corrected and tests were conducted to prove proper operation of the signal system. Responsibility for the wiring error has been determined and discipline will be assessed.						

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
474	4/5/1995	SP	AB			1LBDAT1-03 East	Signal 538	E.E. Winchester	N
<p>Cause</p> <p>Narrative</p> <p>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</p> <p>On April 5, 1995 at approximately 2:50 PM Engineer operating train 1LBDAT1-03 traveling east, was in siding to meet train 1MBSMF2-04. Engineer reported that signal 538 was Green instead of Red after the 1MBSMF2-04 entered the block for signal 538 at MP 66.7 west of Giddings.</p> <p>Under the direction of the Signal Supervisor, the signal system was placed at STOP. It was discovered that a tree branch, broken by high winds, had fallen on the line wires, causing the 20H and 38H wires to wrap, thus making signal 538 indicate Green instead of Red with the block occupied.</p> <p>The tree branch was removed. The signal system was thoroughly tested and found to be working as intended with no exceptions. The signal system was restored to service on April 5, 1995 at 7:45 PM.</p>									
475	4/6/1995	CNW			ATC	BOMVY	Sig. 210 - Insulated Joints	Ogden, IA	N
<p>Failed Equipment or Device - Insulated Joint(s)</p> <p>On 4/6/95 "BOMVY" working at Ogden, IA entered the eastbound main (Trk 2) and observed the eastbound approach signal to the Boone bridge (#210) to be Red with his cab signal showing CLEAR. Investigation revealed both insulated joints at Sig. 210 had failed due to failed metal flow over the top. Normal reverse polarity design on the feed wires caused the signal to go to Red as intended however the 100 cycle train control fed past the insulated joints from the block ahead. Remedied by replacing one insulated joint and slotting the other.</p>									
476	4/10/1995	SEPA	CTC				Open wire - pole line	100' N of Sig. 501, MP 1.0 Warminster Line	N
<p>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</p> <p>Nature of Failure: Engineer reported passing signal 501 displaying APPROACH MEDIUM and approaching next signal, signal 41A, displaying STOP.</p> <p>Cause of Failure: Inspection of pole line conditions revealed open line wire conductor 501AD was crossed with open line wire conductor 41AHA thus energizing 501ADR relay. Fault condition was apparently caused by a severe windstorm that passed through the area.</p> <p>Corrective Action Taken: Re-aligned open wire conductors on pole line.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
477	4/13/1995	KCS	CTC			Ext. Military	?	Vidor, TX	N
			Scenario Reenacted, Unable to Duplicate, No Defects Found						
			<p>On 4/13/95 an Extra Military Train was following a Union Pacific Spray Train on Yellows south out of Mauriceville. The crew reported that they had to put the train in emergency just north of Vidor when they realized they were approaching the rear of the UP Spray Train. On 4/17/95 the Signal Supervisor received a report of a false proceed signal #7851 at Mile Post 758.26 as per attached letter. All applicable tests were performed and the condition could not be reproduced. We were unable to get written statements from the train crew concerning the incident. Please find attached the following items, Drawing of the layout of the signals in the block, Statement from the Signal Supervisor concerning the report and follow up, Statement from the Signal Maintainer and Signal Inspector concerning report and test results, Relay test form, and Megger test forms for North Vidor and signal 7581 & 7582.</p>						
39	4/13/1995	UP	CTC	Manual		UP 3316	None	Binney Junction, California	N
			Human Error - Field Wiring Error, Inadequate Service Testing						
			<p>On April 13, 1995, at 9:30 (CDT), eastbound UP3316 on the Canyon Subdivision observed eastbound signal at CP F180 was Green with the next intermediate signal 183.0 Red and the track occupied between Signal 183.0 and Signal 185.6.</p> <p>An investigation revealed that circuit revisions had been made at Signal 183.0 without making required corresponding revisions at CP F180. Circuit revisions were made at CP F180 restoring the system to proper operation.</p> <p>All applicable tests were performed.</p>						
478	4/15/1995	SP	CTC			1LAPCX2-15	Signal 142RA	East End of Fagan, CA	N
			Failed Equipment or Device - Battery or Circuit Breaker						
			<p>On April 15, 1995 at approximately 4:30 PM, Engineer operating train 1LAPCX2-15 traveling east, reported that signal 142RA at east end of Fagan was Green and the next signal 1572, although dim and hard to see, did display a Red aspect.</p> <p>Under the direction of the Signal Supervisor, the signal system was placed at STOP for testing. Tests revealed that the battery at signal 1572 was low and that the commercial power was off due to a blown circuit breaker. The battery voltage was high enough to energize the 142RAH polar relay at Fagan but not enough to energize the head relay in signal 1572.</p> <p>A new circuit breaker was installed and power was restored. The signal system was thoroughly tested and found to be working as intended with no exceptions.</p> <p>The signal system was restored to service on April 15, 1995 at 5:30 PM.</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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479	4/18/1995	CR	AB			Train UCI-18A, Engi	Signal 29.2	Shire Oaks, PA	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

Engineer on train UCI-18A reported automatic signal 29.2 displayed a CLEAR aspect with 2S at CP Oak displaying Dark over Red. Problem was determined to be incorrect circuit design of the 292TATN and 292TATB track circuit selection through the 2S ALOR. Circuitry was corrected and signal system tested and restored to service.

Investigation being conducted to determine responsibility.

14	4/20/1995	CSXT	CTC			Train U23917	None	Jemison, AL	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

On April 20, 1995, Train U23917 reported they received a CLEAR signal at South Jemison up to a Red signal at North Jemison. Train U23917 did overrun Red signal at North Jemison.

Signal system was removed from service. Signal personnel, along with the FRA, performed all operational tests. The incident could not be duplicated. Signal system was determined to be functioning as intended, and was returned to service.

27	4/25/1995	NS	AB			UP2532-4261-3151	Human Error	Rossville, TN	N
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Human Error - Improper Equipment Installed

At approximately 2:00 PM, Train No. 391, running westbound, observed the westward signal at the east end of Rossville siding display CLEAR. The next signal which was at the west end of Rossville displayed STOP as it should have because an eastbound train, No. 364, was approaching on the single track ahead. Train No. 391 was expecting to stop short of the switch at the west end of Rossville in order to meet No. 364, so a normal stop was made.

The false proceed was reported to the dispatcher, and signal personnel were called to investigate. The incident was recreated and was discovered to be caused by the improper presence of a full wave rectifier between the polar output of the electronic track device and the polar HD relay for the involved signal. This device, an HP-1, caused the polar HD relay to be picked in the "normal" position with either positive or negative polarity feeding out of the ElectroCode HD terminals. The HP-1 was removed, proper testing performed, and the signal system was returned to service.

The HP-1 was intended to provide neutral polarity from a polar HD source on another ElectroCode cabinet. The HP-1 had been removed by the maintainer while troubleshooting a problem about two weeks prior to this incident. Following the troubleshooting the HP-1 was installed on the wrong Electrocode cabinet by mistake and the error was not detected until the incident in question.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
40	4/27/1995	UP	CTC		ACS	CNW 6933		Keith, Nebraska	N	
			Failed Equipment or Device - Relay							
			On April 27, 1995, at 03:50 (CDT) westbound ELNP on Track No. 1 on the Council Bluffs Subdivision reported that the westbound signal at CP B276 was Yellow into an occupied block.							
			An investigation revealed that a loose piece of solder bridged a contact and falsely energized the 1COTESER relay allowing a Yellow signal with a train ahead in the block.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
480	5/1/1995	SP	CTC			1DWHLE 01	Signal 619	Frazer, CO	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			On May 1, 1995 at approximately 7:40 PM, Engineer operating train no. 1DWHLE 01 traveling west, reported that signal 619 at east end of Frazer was CLEAR, then suddenly went Red/Red in their face.							
			Under the direction of the Signal Supervisor, the signal system was removed from service and thoroughly tested. All tests showed the signal system to be working as intended with no exceptions. In addition, computer room reviewed tapes and found no control sent to that location or no indication of CLEAR signal from East Frazer.							
			The signal system was restored to service on May 1, 1995 at 11:59 PM.							
481	5/2/1995	CR	CTC			Train TVLA2, Engin	Signal 1812W	Fonda, NY	N	
			Human Error - Improper Circuit Jumper in Place							
			Engineer on train TVLA2 reported signal 1812W displayed APPROACH Medium aspect with 4W at CP184 at STOP. Cause was found to be jumper wires applied to Master Decoding Transformer limiting resistors, which applied increased energy to the decoding units. This caused 120 Decode Unit to respond to 75 code rate. Jumpers were removed, circuitry tested and signal system restored to 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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482	5/4/1995	ATSF	CTC			526	Underground Cable	Near Lucy, NM	N
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Vandalism - Instrument Case, Cable, or Junction Box Damaged

Approximately 5:11 AM, May 4, 1995, crew on the S-KCLB5-03 reported they were lined westbound into the siding at the east end of Lucy with a Red over Green aspect at control signal (L) and the approach signal 8261 displayed Green instead of Flashing Yellow for their train. Signal personnel were notified and their investigation of the reported incident verified the condition reported. Further investigation determined that a contractor installing an antenna tower for radio control of the CCT control point, had driven a ground rod through the underground cable that runs from the instrument house to the westbound control signal (L) at the east end of Lucy. This condition provided a cross path for the B10 battery conductor and the LAHDP conductor. The LAHDP is the pole change circuit for approach signal 8261. The underground cable was repaired temporarily and signal system tested to prove proper operation. Later the same day (5/4/95) the damaged underground cable was replaced and signal system retested.

483	5/11/1995	SP	CTC			SP 1WCKCQ-11	Signal 208RA	Garnet, CA	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

On May 11, 1995 at approximately 11:05 PM, Engineer operating train no. 1WCKCQ-11 traveling east on the Main Track at Garnet, reported that signal 206R at the west end of the South siding was Yellow. The next signal 208RA at the east end of the North siding was Yellow then changed to Flashing Yellow. The next signal 210RA was Red. The incident occurred during a sand storm.

Under the direction of the Signal Supervisor, the signal system was removed from service and thoroughly tested. It was revealed that line wires 206RAH and N206RAH had gone slack, causing them to intermittently touch when blown by high winds, thus causing the line series relay to pick up and drop, turning the signal light on and off and giving it the appearance of a Flashing Yellow aspect.

The line wire was tightened. The signal system was thoroughly tested and found to be working as intended with no exceptions. The signal system was restored to service on May 12, 1995 at 12:30 AM.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
484	5/14/1995	SP	CTC			BN 1BN681-13	Signal 316LB	E.E. Algoma, OR	Y
<p>Cause</p> <p>Scenario Reenacted, Unable to Duplicate, No Defects Found</p> <p>On May 14, 1995 at approximately 6:06 AM, BNRR crew (Engineer, Student Engineer, Conductor), operating BNRR train 1BN681-13 traveling west, reported to have entered the east end of Algoma siding with the facing signal displaying Red over Yellow, and while proceeding west on the siding, collided with the rear of Southern Pacific train 1CORVM-14 which was stopped in the siding.</p> <p>Under the direction of the Signal Supervisor, train dispatcher WS66 was asked to duplicate the conditions under which the BN train 1BN681-13 entered the siding. When the switch at E.E. Algoma was reversed and the westbound was cleared into the siding, the facing signal displayed Red over Lunar. This test was repeated several times always with the same result.</p> <p>The signal system was thoroughly tested and the pole line between East and West Algoma was also inspected. All tests showed the signal system to be working as intended with no exceptions.</p> <p>The signal system was restored to service on May 15, 1995 at 4:30 PM.</p>									
485	5/21/1995	SP	CTC			SP 1WCHOQK-21	Signal 116R	Loma Linda, CA	N
<p>Cause</p> <p>Scenario Reenacted, Unable to Duplicate, No Defects Found</p> <p>On May 21, 1995 at approximately 11:45 PM, Engineer operating train no. 1WCHOQK-21 traveling east on the No. 2 track reported that as he went by signal 116R, the signal was Green. The train then passed into the block between signal 116R and signal 126R and stopped to cut in a helper engine on the rear of the train. The train then proceeded towards signal 126R at Redlands Xover and found the 126R to be Red over Red.</p> <p>Under the direction of the Signal Supervisor, the signal system was removed from service and thoroughly inspected and tested with the train still in the block. Repeated tests revealed that signal 116R must have indicated a Yellow aspect when the train went by it. All tests showed the signal system to be working as intended with no exceptions.</p> <p>The signal system was restored to service on May 22, 1995 at 10:05 AM.</p>									
486	6/3/1995	CR		Manual		Train JR-7, Engine	Signals 10RA and 6R	"Upper Bay" Newark, NJ	N
<p>Cause</p> <p>Maintenance - Equipment Inadequately Secured to Ground</p> <p>Engineer on train JR-7 reported signal 10RA displayed RESTRICTING while train OI-21 was occupying a conflicting route governed by signal 8R. In addition, signal 6R was displaying RESTRICTING simultaneously with signal 10RA. Cause was determined to be high double case at location 2W was blown over by high winds and rain, causing 6RBHB and 10RAH relays to be inverted. Case support brackets were repaired and case placed on foundations, signal system tested 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?
			Cause						
			Narrative						
487	6/14/1995	CR		Remote		Train YPAL-22, En	Signal 4E @ CP-JU	Bethlehem, PA	N
							Human Error - Field Wiring Error, Inadequate Service Testing		
							Engineer on train YPAL-22 observed signal 4E at CPJU displaying an APPROACH SLOW aspect with signal 5R at CP Bethlehem displaying RESTRICTING. Cause was found to be crossed conductors, 5RCHD and 5RCGP circuits, in cable from 5RC signal mechanism to case at CP Bethlehem. Cable repaired, signal system tested and returned to service.		
41	6/16/1995	UP	AB			UP6317	Switch Circuit Controller	Stanton, Texas	N
							Maintenance - Switch Circuit Controller		
							On June 16, 1995, at 10:55 (CDT) westbound FWEP16 on the Baird Subdivision reported a Green westbound signal at the east end of Stanton with the switch reverse at the west end of Stanton.		
							An investigation revealed the switch circuit controller at the west end of Stanton had bad roller and tension springs that, under vibration, would lose the "shunt circuit" with the switch in a reverse position.		
							The signal system was restored to proper operation, and all applicable tests were performed.		
488	6/17/1995	ATSF	CTC			UP 5055	Track Relay	Near Keenbrook, CA	N
							Failed Equipment or Device - Relay		
							Approximately 8:19 PM, June 17, 1995, crew on the (UP) F-CNYR1-17 reported intermediate signal 672 was Yellow as they passed signal and upon approach of next intermediate signal 642 they observed an eastbound train with approximately six or seven cars in their block. Signal personnel were notified and their investigation of the reported incident verified the condition reported. Further investigation determined that with standard .06 ohm shunt (2ATR) track relay would de-energize but signal control circuit stayed energized. The track relay was found to have moisture on the contacts allowing signal control circuit to be energized with track relay in the de-energized position. The track relay was replaced and signal system tested to prove proper operation. All other relays in the instrument case were inspected and found to be moisture free. The defective track relay will be returned to US&S for their investigation to determine how the moisture was allowed to enter the sealed relay		

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
489	6/17/1995	SP	CTC			SP 1CXPHM-17	Signal 2521	Altheimer, AR	N
			Scenario Reenacted, Unable to Duplicate, No Defects Found						
			<p>On June 17, 1995 at approximately 11:15 AM, Engineer operating train No. 1CXPHM-17 traveling west, reported that signal 2521 was Green and the next signal 260LA, at East End of Altheimer, was Red.</p> <p>Under the direction of the Signal Supervisor, the signal system was removed from service and thoroughly inspected and tested. Every test performed indicated that signal 2521 must have indicated a Yellow not a Green. The signal system was shown to be working as intended with no exceptions.</p> <p>The signal system was restored to service on June 17, 1995 at 4:30 PM.</p>						
15	6/19/1995	CSXT	CTC			Train R69718	Vandalism	North Rocky, TN	N
			Vandalism - Instrument Case, Cable, or Junction Box Damaged						
			<p>On June 19, 1995, Train R69718 reported a MEDIUM APPROACH at North Rocky, TN. This route was not requested. Train crew reported vandals shooting firearms at signal housing; Train Dispatcher removed signals from service.</p> <p>Signal Department personnel investigated incident and discovered vital signal cable and extensive damage from vandalism.</p> <p>Signal personnel completed repairs and made all operational tests. Signal system was returned to service.</p>						
490	6/21/1995	SP	CTC			SP 1ZIWCM-21	Signal 32RB	Marne, CA	N
			Phantom Signal - Due to Object in Foreground or Background						
			<p>On June 21, 1995 at approximately 5:45 PM, Engineer operating train no. 1ZIWCM-21 traveling east, reported that while waiting in a siding, he observed signal 32R, 1/4 miles away, and noticed that the bottom head (the 32RB) appeared to intermittently change from Red to Yellow instead of remaining Red.</p> <p>Under the direction of the Signal Supervisor, the signal system was removed from service and thoroughly inspected and tested in conjunction with the dispatch center. All tests showed the signal system to be working as intended with no exceptions.</p> <p>It should be noted, however, that at the time of the incident, a westbound train carrying a number of bright orange trailers was passing under the 32R cantilever, and the reflection of the afternoon sun upon these orange trailers might have washed out the Red aspect as each trailer passed by the signal, thus giving the illusion of an intermittent Red and Yellow,</p> <p>The signal system was restored to service on June 21, 1995 at 9:00 PM.</p>						

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
16	6/22/1995	CSXT	CTC			Train R220	None	CT, Cincinnati, OH	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			On June 22, 1995, Train R220 alleges having a CLEAR signal at CT just prior to running through switch lined against his move.							
			Signal system was removed from service; signal personnel investigated the incident performing all operational tests. The incident could not be duplicated. Signal system is returned to service.							
491	6/28/1995	SP	CTC			SP Helper	Signal 164RA	Pershing, CA	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			On June 28, 1995 at approximately 2:45 PM, Engineer operating SP Helper Engines traveling east, reported that signal 164RA at the West End of Pershing was Green and when the next signal 166RA at the East End came into view it displayed Red. Signal 164RA should have displayed Yellow.							
			Under the direction of the Signal Supervisor, the signal system was removed from service and thoroughly inspected and tested. All tests showed the signal to be working as intended with no exceptions. The Digicon replay from the Denver computer room corroborated the finding that signal 164RA was Yellow.							
			The signal system was restored to service on June 28, 1995 at 6:20 PM.							
492	6/29/1995	SP	CTC			SP 1ARCKC-29	Signal 272	Plain, CO	N	
			Failed Equipment or Device - Battery or Circuit Breaker							
			On June 29, 1995 at approximately 12:48 PM, Engineer operating train no. 1ARCKC-29 traveling east, reported that he observed that signal 272 approach to West Plain was Flashing Yellow and he then found the eastward absolute signal at West Plain Red and overran it.							
			The Signal Engineer and Signal Supervisor investigated and found that the battery was low due to an open fuse in the AC powerline. They found that a battery voltage of about 6.2 volts would cause the 72S relay to pump causing the signal to display a Flashing Yellow aspect until the battery dropped to about 5.2 volts where it went to STOP.							
			The signal system was thoroughly tested and no other problems were found. We have continuously lighted the signals to prevent a reoccurrence of this problem with the approach lighting circuit.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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17	6/30/1995	CSXT	CTC			Train Q31728	Signal 2001	Keyser Station, WV	N
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Failed Equipment or Device - Interior Wiring

On June 30, 1995, Train Q-31728 reported receiving two Yellows and a marker at Signal 2001 with crossover at Keyser Station line from #1 to #2.

The signal system was removed from service. Signal personnel performed all operational tests and discovered the RE circuit was lodged with the YE circuit. Repairs and additional operational checks were made.

Signal system is not functioning as intended and is returned to service.

493	7/4/1995	SP	CTC			SP 1LBCXT-02	Signal TS	E.E. Paisano, TX	N
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Phantom Signal - Due to Unpainted Signal Hood or Background

On July 4, 1995 at approximately 11:45 AM, Engineer operating train no. 1LBCXT-02 traveling east on the Paisano siding, reported that at 3000 feet from the East End of the siding, signal TS appeared to be Green; but as he got closer, to about 1000 feet of the end of the siding, he saw that the signal was indeed Red.

Under the direction of the Signal Supervisor, the signal system was put to STOP and thoroughly inspected and tested, and was found to be working as intended with no exceptions.

The signal system was restored to service on July 4, 1995 at 5:00 PM.

The Signal Supervisor returned to the location the next day, at the same time, to monitor the signal in question and found that there could have been a reflection problem from the underside of the hood. This was corrected and a 30 degree spread lens was installed to improve the visibility of the signal across the curve.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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494	7/6/1995	IHB		Manual		IHB 9206, 9209	Signal 15-16	Dolton, IL	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

At approx. 0615 am, Thursday, July 6, 1995, IHB train BA-2, Engine 9206 was proceeding eastbound from the IHB Blue Island Yard, Riverdale, IL, on Track 2 when the train passed absolute signal 15-16 in the STOP position at Dolton Interlocking, Dolton, IL. Absolute signal 15-16 is a three unit searchlight signal with GRS Type SA mechanisms.

The IHB engineer stated that he had observed signal 15-16 after passing the ICG overhead bridge and that signal 15-16 was displaying a Red/Red/Yellow aspect for a RESTRICTING indication and was proceeding through the interlocking at Restricted Speed when he was asked where he was going by the Dolton Tower Operator and told to stop his train.

The IHB Conductor was in the trailing unit, IHB 9209 and unable to see the aspect displayed by signal 15-16.

The IHB Helper was on the lead unit, IHB 9206, and said the signal 15-16 displayed a Red/Red/Yellow aspect for a RESTRICTING indication.

The Dolton Tower Operator stated that he never lined the signal lever to clear signal 15-16 for train BA-2's move.

Signal 15-16 will display a Red/Red/Yellow aspect for a RESTRICTING indication only for a following move in the eastbound direction.

The lamp voltages were found to be: Signal 15A - 9.6V; Signal 15B - 9.6V; and Signal 16 - 10.2V. No exceptions taken.

The signal lenses, hot spots and cover glasses were found to be intact, clean and properly aligned. All cable meggered clear. No crosses or grounds were detected. All relays and signal mechanisms were within operating specifications. As traffic locking was functioning as intended. No exceptions taken to any items inspected and/or tested.

Signal was observed the next morning at the same time of day under nearly identical weather conditions with no visibility interference from the rising sun detected.

Train crew was scheduled for investigation on Friday, July 14, 1995, but waived investigation and accepted discipline of thirty day suspension.

495	7/7/1995	ATSF	CTC			608W	None	Argentine, Kansas	N
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Phantom Signal - Due to Object in Foreground or Background

At approximately 9:53 AM, July 7, 1995, crew on H-SRBA1-07 reported their train sitting on 2 track waiting for an eastbound train that was crossing over from 2 track to 1 track. Crew observed the 4W control signal flash between R/R and Y/Y while the eastbound train was passing under signal. Signal Department was notified and made inspection and operational test of the system in question. All signal tests concluded signal system was operating properly. Subsequent investigation revealed that the signal aspects looked like a reflection or phantom aspect. Special signal hoods are being installed on the bottom side of these signals. This is being reported as a phantom aspect signal incident.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
496	7/8/1995	SP	AB			1LBCHT1-06 East	Signal 16172	Hargis, NM	N	
			Failed Equipment or Device - Battery Charger							
			On July 8, 1995 at approximately 7:15 AM Engineer operating eastbound SP train 1LBCHT1-06, reported that he passed signal 16172 on a Green aspect and then found signal 16198 Red and signal 16212 Dark.							
			The Signal Supervisor tested the signal system and found that the battery charger (rectifier) at signal 16212 had failed, causing the battery voltage to drop to about 3-4 VDC. This caused signal 16198 to go Red after the train passed signal 16172. The battery charger was replaced and the signal system was thoroughly tested with no other defects found, and signals operating as intended.							
			The signal system was restored to service on July 8, 1995 at 3:00 PM.							
497	7/12/1995	ATSF	CTC			7161	Circuit Design Error	Mykawa, Texas	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			Approximately 10:19 PM, July 12, 1995, train crew on the F-01756-12 reported eastbound control signal (2R) West End Mykawa was CLEAR and the next signal 2RA at East End Mykawa was Red. Signal Department was notified of condition reported and were able to reproduce the condition. Investigation revealed that a circuit design error was the cause of the reported incident. The circuit design error was corrected and the signal system was tested to prove proper operation.							
498	7/12/1995	SP	CTC			SP 1LBAVT2-11	Signal FM	Sanderson, TX	N	
			Phantom Signal - Due to Foreign Light Source							
			On July 12, 1995 at approximately 10:45 PM, Engineer operating train no. 1LBAVT2-11 traveling east, reported that signal 5196 was Flashing Yellow and the next signal, the FM approach to the West End of Sanderson, appeared Green, but when the train got to about 1/4 mile from W.E. Sanderson he saw that the signal was Yellow.							
			Under the direction of the Signal Supervisor, the signal system was placed at STOP and thoroughly tested. All tests showed the signal system to be working as intended with no exceptions. Further investigation found that because of the track's curvature in advance of West End signal, at one point the tracks line up directly with a nearby trailer park, and a green light or neon sign at the trailer park could have been mistaken for a Green signal light.							
			The signal system was returned to service on July 13, 1995 at 5:00 AM.							

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
18	7/16/1995	CSXT	AB			Train Z49115	Signal 272.1	Campbellsburg, IN	N
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)						
			On July 16, 1995, Train Z49115 reported the signal at the 272.1 M.P. was displaying a clear signal north and south.						
			The signal system was removed from service. Signal personnel investigated the incident and discovered the control wire for Sycamore Street crossing was wrapped with HD control for Signal 272.1.						
			Line wires were unwrapped, operational tests completed, and signal system was returned to service.						
499	7/16/1995	HBT		Remote		UP 1619	CL	Houston, Texas	N
			Scenario Reenacted, Unable to Duplicate, No Defects Found						
			Sunday, July 16, 1995, approx. 11:26 AM, PTR A Job 155, lead engine number UP 1619, moving north on Strutt siding, passed ground mount ME color light signal, did not run through any switches or cause any damage. Speed est. at 10 MPH.						
			Signal test made by Signal Foreman and Maintainer included visual inspection of signal to assume no holes in housing to allow sun light in, voltage test on light wires, ground test, voltage test on control wires.						
			No problem found.						
500	7/19/1995	ATSF	CTC			3448	Human Error	Kansas City, KS	N
			Human Error - Signal, Improper Lenses Installed						
			Approximately 12:20 PM, July 19, 1995, train crew on the work train reported signal 176 was displaying a Yellow aspect for their route, and felt it should have been a lunar aspect. Signal Department was notified and their investigation of the reported incident verified the condition reported. Further investigation determined that the H2 head relay of signal 176 had the wrong color roundel in the left position. The H2 head relay was replaced to provide a lunar roundel instead of a yellow roundel. The signal system was tested to prove proper operation. Person responsible for condition found is under investigation so discipline can be assessed.						

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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42	7/21/1995	UP	CTC	Manual		UP5040	None	Fort Worth, Texas	N
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Vandalism - Instrument Case, Cable, or Junction Box Damaged

On July 21, 1995, at 10:46 (CDT) on the Dallas Subdivision at Tower 55, the northbound home signal at Control Point T756 displayed a Yellow signal, and the westbound home signal on Track No. 2 at Control Point T944 displayed a Yellow signal with westbound LDCV-20 occupying the interlocker on No. 2 track.

An investigation revealed the GP relay for the westbound Home Signal at Control Point T944 was tipped over from the case being struck by contractor equipment.

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

28	7/25/1995	NS		Remote		Unknown	Design	Spriggsboro, IN	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

At approximately 4:00 PM, Train No. 308 received and took a DIVERGING CLEAR indication on the eastward signal from the Ft. Wayne District to the Chicago District at the West End Spriggsboro. Their route was lined onto the Chicago District Main Track and in the same plant into the siding. The crew had a STOP indication on the eastward signal at the east end of the siding. The train was stopped before passing the STOP signal, and the crew reported the improper signal they had received at the West End Spriggsboro. Signals at Spriggsboro were kept in STOP position for train movements until the signal system could be verified.

Signal personnel investigated, and found that with the mainline eastward signal cleared at the East End Spriggsboro, the eastward signal off the Ft. Wayne District would display DIVERGING CLEAR instead of the correct DIVERGING APPROACH on a route lined into the siding. The "D" relay for this signal was energized by circuitry for an alternate route.

Signal changes installed earlier in the year had a design error that was not found during cut-in tests on this untypical line-up of signals. The design error was corrected and the interlocking was completely tested before being returned to service.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
501	7/25/1995	SP	CTC			SP 1LBMFT-24	Signal FM	West Rosenfield, TX	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			On July 25, 1995 at approximately 6:45 PM, Engineer operating train no. 1LBMFT-24 traveling east, reported that the approach signal to the West End of Rosenfield was Flashing Yellow, that signal FM at the West End was Green and that the next signal, the TM signal at the East End of Rosenfield was Red. The FM signal at the West End should have been Yellow.							
			Under the direction of the Signal Supervisor, the signal system was placed at STOP and thoroughly tested. All tests showed the signal system to be working as intended with no exceptions.							
			The signal system was returned to service on July 26, 1995 at 10:00 AM.							
502	7/26/1995	SP	CTC			SP 1DALAF-25	Signal RA	East Finley, TX	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			On July 26, 1995 at approximately 7:50 AM, Engineer operating train no. 1DALAF-25 traveling west, reported that the westward absolute signal at the East End of Finley was Green then went Yellow in his face with an eastbound train going into the siding at the West End.							
			Under the direction of the Signal Supervisor, the signal system was placed at STOP and thoroughly tested. All tests showed the signal system to be working as intended with no exceptions.							
			The signal system was returned to service on July 26, 1995 at 1:00 PM.							
43	7/26/1995	UP	CTC	Manual		SP FHOCHQ	None	Lennox, IL	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			On July 26, 1995, at 19:16 (CDT) on the Pana Subdivision at Lennox Interlocker, eastbound SP FHOCHQ reported a Red over Green over Red home signal with a trailing point switch lined against them.							
			An investigation revealed the signal circuits were not designed to check trailing point switches in the control network.							
			Circuit plans have been revised and the switch position relay contacts are being installed in the proper control circuits.							
			The signal system was restored to proper operation, and all applicable tests were performed.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
503	8/4/1995	GTW	AB			5858	Block Line	Shaftsburg, MI	N
<p>Cause</p> <p>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</p> <p>Severe storm conditions toppled trees into pole line, resulting in damage to signal control wires. On August 4, 1995 at 0200 hours, GTW train 456B, Extra 5858 East reported PROCEED indication (GTW Rule 281) at ABS signal 2312 and PROCEED AT RESTRICTED SPEED indication (GTW Rule 290) at signal 2344. Fallen tree at MP 233.0 forced signal control "H" wire to make contact with signal control "D" wire. Trees in pole line in advance of signal 2344 had broken "H" and "D" wires, causing Red aspect at signal 2344.</p>									
504	8/7/1995	CR		Remote		Train BAL-2AH, En	CP Shocks, Cab Signal at 110L Signal	Shocks Mill, PA	N
<p>Failed Equipment or Device - Full Wave Rectifier</p> <p>Engineer on train BAL-2AH reported cab signal ungraded from RESTRICTING to APPROACH MEDIUM with wayside home signal 110L displaying STOP. Cause was found to be shorted W-10 transformer on 111 track circuit. Transformer replaced, signal system tested and placed back in service.</p>									
44	8/9/1995	UP	AB			PRBME	None	Des Plaines, IL	N
<p>Failed Equipment or Device - Relay</p> <p>On August 9, 1995, at 12:00 (CDT) on the New Line Subdivision at M.P. 8.8, PRBME reported eastbound signal 22 displaying a Yellow indication with 22's block occupied.</p> <p>An investigation revealed the 22H relay had a burnt contact jumpered around in the signal lighting circuit.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</p>									
45	8/10/1995	UP	AB			UP2400	Track Relay	Adair, OK	N
<p>Failed Equipment or Device - Relay</p> <p>On August 10, 1995, at 11:30 (CDT) on the Cherokee Subdivision while the MOWDWD-10 was switching at the south end of Adair, Oklahoma, the southbound leaving signal at M.P. 454.5 displayed a Green indication with the main line track circuit south of the OS circuit occupied.</p> <p>An investigation revealed the signal being held in a Green position by the track relay for the occupied track circuit having contacts fused in the normally-energized position caused by a lightning strike. The track relay was replaced.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
505	8/11/1995	SP	AB			SP 1KCOAF-09	Signal 7401	Walkinghood, KS	N
<p>Cause</p> <p>Maintenance - Switch Shunt Wires Broken</p> <p>On August 11, 1995 at approximately 8:00 AM, Engineer operating train no. 1KCOAF-09 traveling west, reported that signal 7401 at the East End of Walkinghood was CLEAR with the switch at the West End lined for the siding.</p> <p>The signalmaintainer found that the shunt wires from the switch circuit controller to the track had been cut off by the switch rod and tie plate, thus eliminating the switch protection.</p> <p>The shunt wires were replaced, and the signals were then found to operate as intended with no exceptions. The signals were placed back in service on August 11, 1995 at 9:00 AM.</p>									
506	8/12/1995	SP	AB			SP 1EPKCT-12	Signal 14174	Three Rivers, NM	N
<p>Scenario Reenacted, Unable to Duplicate, No Defects Found</p> <p>On August 12, 1995 at approximately 3:50 PM, Engineer operating train no. 1EPKCT 12 traveling east, reported that signal 14174 was Yellow, while the rear of the train ahead no. 1LBCHT1-10 was still in the block.</p> <p>Under the direction of Signal Supervisor J.L. Stevenson, the signal system was thoroughly tested. All tests showed the signal system to be working as intended with no exceptions.</p> <p>The following day, the Division Signal Engineer and the Signal Supervisor made further operational tests and observed the signal at the same time of day for evidence of phantom indication. They found the signal system to be working as intended. They did not, however, that the Electrocode 4 receiver LEDs flashed while being checked for pickup values, so they replaced the Electrocode 4 box and module as a precautionary measure.</p> <p>The signal system was returned to service on August 13, 1995 at 5:55 PM.</p>									
47	8/12/1995	UP	CTC			UP 3598	Relay, Insulated Joint	Pickens, LA	N
<p>Failed Equipment or Device - Relay</p> <p>On August 12, 1995, at 13:50 (CDT) on the Monroe Subdivision, northbound GSWWEG-11 observed a Green indication from northbound approach signal 435 while northbound signal 433 at the control point indicated a Red over Lunar.</p> <p>An investigation revealed a shorted insulated joint and track relay out of tolerance at Approach Signal 435.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
46	8/16/1995	UP	CTC			UP9191	None	Auburn, WA	N
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing						
			On August 16, 1995, at 2:48 (CDT) on the Seattle Subdivision at Control Point S162, northbound APSEZ-13 reported northbound signal displayed a Flashing Red over Red with the switch north of the signal out of correspondence.						
			An investigation revealed a problem in the circuit design. Circuits were revised; the signal system was restored to proper operation, and all applicable tests were performed.						
507	8/16/1995	WC	AB				Signal 2071	Anton - Weyauwega, Wisconsin	N
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing						
			Empty hopper train was following a westbound engine with one car at restricted speed. Hopper train observed signal 2071 go from Red to Green for about two seconds and then back to Red. This occurred at the time the engine and car passed signal 2109, the next signal in advance.						
			The passage of the short, fast train by 2109 caused the track circuit in rear of the signal to pick up before the slow release signal YGP had dropped, hence, the brief false clear on 2071. This sequence of events also dropped the directional stick prematurely, hence, 2071 reverted to Red.						
29	8/22/1995	NS	CTC			8883	Resistor	Brandy Station, VA	N
			Failed Equipment or Device - Track Resistor						
			Train No. 342, northbound, passed signal 60.8 which was displaying CLEAR. Conductor and Engineer Trainee looked back and observed that southward signal 60.9 displayed APPROACH while their train was still occupying the 60.9 track circuit.						
			Investigation revealed that the Trakode bleeder resistor, design value of 12.5 ohms, had a resistance of 96 ohms. This was a change in the value of the resistor itself rather than a connection. This high resistance value prevented the resistor from properly acting as a bleeder. With this resistor in place, the 60.9 signal would occasionally display APPROACH when a shunt was placed about 1000 feet south of the signal. Once duplicated, it was evident that the 60.9 track relay would pick up on the negative side with each pulse of the CP relay on the south track. The track currents were found to be normal. The false proceed was not easy to reproduce; several northbound trains were observed without recurrence. Several variable factors were obviously involved in reproducing this incident, presumably train speed, train shunt and track conditions.						
			A proper value resistor was installed to alleviate this situation.						

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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509	8/24/1995	IC	CTC			GNOCH24, WC174	Signal 2LB	Skip, LA	N
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Human Error - Improper Equipment Installed

Signal LB displayed a SLOW CLEAR indication for trailing route through turnout reverse, when switch points were normal. Two engines split switch. This incident was called in per FRA 233.5 at 11:40 CDST, 8-24, FRA Rpt#305107.

Investigation found that the pin attaching the throw bar to the throw rod broke. When the switch was called reverse the points remained normal. The point detector circuit had voltage of normal polarity, and the KP relay was reverse connecting the RWCR to this normal voltage. Since the RWCR was a neutral relay, it energized.

During a previous cutover the original relay (600 ohm biased-neutral) was changed to a 900 ohm neutral relay with more contacts. The tests did not detect the error since the tests did not include mechanical failures, or simulations which disconnect the motor, which prevented the switch points from moving.

30	8/25/1995	NS		Remote		Unknown	Human Error	Columbus, OH	N
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Human Error - Field Wiring Error, Inadequate Service Testing

At approximately 4:00 AM, Train No. 195 had set off five cars in the west end of the Middle Track at Bannon but did not return the derail to derailing position when they left. No. 195's crew asked Train No. L78's crew to replace the derail for them when they came west. No. L78 came out of the intermodal ramp and proceeded west on the Westbound Main. No. L78 had a CLEAR indication at the west end of the Middle Track which was the signal protecting the electric lock switch to the Middle Track. With the derail left off, this signal should not have cleared.

Signal personnel investigating the incident determined that the Middle Track derail was not setting signals to STOP when in the reverse position. The cause was found to be that during a recent construction project the "OS" track wires that had fed through the derail controller box had been replaced with new wires that went directly to the track. There was no evidence on the circuit plans that the track wires had gone through the derail, so the construction forces assumed that the derail was not involved in the work they were doing. The track wires were rerun and broke back through the derail circuit controller to correct the problem.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
508	8/25/1995	SP	CTC			Amtrak No. 6	Signal 7274	East Riverton, UT	N	
			Failed Equipment or Device - Interior Wiring							
			On August 25, 1995 at approximately 7:00 AM, Engineer operating Amtrak train no. 6 traveling east, reported that signal 7274 at the East End of Riverton displayed Green over Yellow on the same signal head, when signal should have been Green.							
			The Signal Maintainer inspected the signal system and found that behind the cable board, in the junction box, the HG and DG wires were pinched together and shorted, thus causing the signal to display Green and Yellow at the same time.							
			The wires were separated and insulated. The signal system was tested and found to be working as intended with no exceptions.							
			The signal system was returned to service on August 25, 1995 at 10:00 AM.							
510	8/26/1995	HBT	CTC			SP 2694	Track Repeater	Houston, Texas	N	
			Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)							
			Bridge gang started construction work Sept. 1, 1995 to replace wooden bridge with concrete bridge. Signal cables buried beside the track, in the bridge approach, had been damaged. On the evening of Sept. 26, 1995, SP 2694 with 81 cars was moving approx. 5 MPH across bridge going into SP yard. The HBT Operator had lined the route and when train entered control point circuit, the Operator started another route. When the 24th car of the SP train was crossing the no. 2 switch, the track repeater relay in the control house picked up, choosing [illegible] the control point and [ends in midsentence]							
			Allowed the stored route to clear, which called for the no. 2 switch to return to normal. Found the damaged cable had a 10 amp ground on the TP wires. The track relay was deenergized. The TP relay was the only relay with false battery at the time. Switch cable and trunk cables were meggered and found to be bad and taken out of service. Control point temp. out of service while new cable being installed.							
			This location had been tested in July 1995, no grounds found.							
			Report late because of oversight by office while I was at AAR conference.							
511	8/28/1995	CR	AB			Train PIH08, Engine	Signal 549	Columbiana, OH	N	
			Human Error - Improper Circuit Jumper in Place							
			Engineer on train PIH08 reported signal 549 displayed STOP AND PROCEED with train 261F (with engine and 3 cars) ahead. When train 261F occupied the interlocking at CP Lum, signal 549 went to CLEAR for about 60 seconds, then to APPROACH. Cause was found to be an unauthorized jumper applied to the 4TR track circuit. Jumper removed, signal system tested and returned to service. Investigation being conducted to determine responsibility.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
512	8/28/1995	SP	CTC			SP 1SGSNC-27	Signal 6598A	East Gilluly, UT.	N	
			Phantom Signal - Due to Sun Angle							
			On August 28, 1995 at approximately 7:25 AM, Engineeroperating train no. 1SGSNC-27 traveling east, reported that as they were heading towards the East End of Gilluly, signal 6598A was Red, but as they got closer, the signal looked Yellow. The train proceeded but found the switch lined against them.							
			Under the direction of the Signal Supervisor, the signal system was inspected and thoroughly tested. All tests showed the signal system to be working as intended with no exceptions. The following morning, at the same time of day, the Signal Engineer and Signal Supervisor returned to the location for a visual inspection and observed that the early morning sun, shining on the signal, caused the Red aspect to look Yellow. A phankill unit was installed, and the problem was eliminated.							
			The signal system was returned to service on August 28, 1995 at 2:00 PM.							
513	8/29/1995	CR	CTC			Train TV-79, Engin	Signal 355W	Pittsford, NY	N	
			Failed Equipment or Device - Relay							
			Engineer on train TV-79 reported that signal 355W displayed CLEAR with signal 359W at STOP AND PROCEED. Problem was determined to be defective 355WHDR, 220-ohm retained neutral, style B2, polar relay. Relay was stuck in the normal position. Relay removed from service, replacement relay installed, signal system tested and placed back in service. Relay is being taken to manufacturer to determine cause of failure.							
514	9/1/1995	MNCR	CTC			Train 1504	Insulated Joint	East Norwalk, CT	N	
			Failed Equipment or Device - Insulated Joint(s)							
			Train #1504 received a Normal Cab because the route ahead was clear. The 4244 signal displayed STOP AND PROCEED due to defective insulated joint.							
19	9/5/1995	CSXT	CTC			Train P62405	#6 Signal	N. Boynton Beach	N	
			Vandalism - Instrument Case, Cable, or Junction Box Damaged							
			On September 5, 1995 Train P62405 reported that Train P62705 had a medium clear out of siding while P62405 had a clear signal down the main line.							
			Signal system was removed from service. Signal department personnel investigated the incident and discovered that vandals had damaged junction box causing the LBRG control to contact the LBDG control.							
			The junction box was repaired and operational test completed. Signal system was returned to service.							

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
516	9/11/1995	ATSF	AB			811	Unknown	Colmor, NM	N
			Scenario Reenacted, Unable to Duplicate, No Defects Found						
			Approximately 6:10PM, September 11, 1995 Amtrak engineer reported signal 7102 at the west switch of Colmor Red and approach signal 7112 was Green for his train. Signal Department was notified and made operation test of the signal system in question, with no exceptions taken. The control relay for signal 7112 was replaced (22HDR) as a precautionary measure. The signal control relay (22HDR) has been sent to our signal repair shop for more extensive tests and inspections.						
48	9/13/1995	UP	CTC			UP3589	None	Mesquite, TX	N
			On September 13, 1995, at 09:22 (CDT) on the Dallas Subdivision, westbound LIFW-12 observed westbound Signal T207 CLEAR (Green) with westbound signal T208 APPROACH MEDIUM (Yellow/Yellow), and westbound signal T209 at STOP (Red).						
			An investigation revealed the Yellow/Yellow signal at westbound signal T208 was caused by a wrap in the line wires shorting the 25RBH and 25RHD circuit which had the same common.						
			The system was restored to proper operation, and all applicable tests were performed.						
31	9/18/1995	NS	CTC			Unknown	Signal	Maxwell, MO	N
			Phantom Signal - Due to Object in Foreground or Background						
			At approximately 7:40 AM, westbound SP Train CHRBM was in the BN siding east of Maxwell Control Point as eastbound BN Train 154 cleared them on the BN main track. Train CHRBM got a DIVERGING APPROACH indication on the leaving signal at the BN siding, and at the same time called out STOP indication which they saw on the next signal, the 48L signal at NS Control Point Maxwell. The 48L signal was about 1300' ahead of the train as it started to move out of the BN siding. The SP engineer stopped his train at a point about 780' from 48L signal to let vehicular traffic pass on highway crossing. At that location, the crew reported seeing 48L display Red over Yellow, DIVERGING APPROACH, and so the engineer started to move again toward Maxwell. When the train got within about six (6) car lengths from signal 48L, they noticed it was then Red over Red, STOP. The engineer was able to stop the train with only one truck of the lead engine past the 48L signal. The NS dispatcher had not lined a route for Train CHRBM, and this fact was verified later by reading data loggers.						
			Signal personnel were called to investigate and after making appropriate operational and FRA tests, were unable to duplicate the incident or find any problem with the signal system. A phantom signal was suspected and confirmed four days later under similar sunlight conditions. It seems that the rising sun was reflected partly by some aluminum signal cases on the north side of the track, and that contributed to the phantom. A 10-degree deflecting lens on the 48LB head was removed to lessen the chance of the phantom signal. The signal was realigned to account for track curvature. The 48L signal was also changed from approach to continuously lit due to the fact that a phantom has been seen on it, and a dark signal is more susceptible to a phantom aspect.						

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
517	9/22/1995	SP	CTC			SSW8053, 1LBMFT	Signal 1576	Luling, TX	N
<p>Cause</p> <p>Narrative</p> <p>Scenario Reenacted, Unable to Duplicate, No Defects Found</p> <p>On September 22, 1995 at approximately 7:45 PM, Engineer operating train no. 1LBMFT1-20 traveling east, reported that signal 1576 was Green followed by a Yellow at the West End of Luling, and a Red at the East End of Luling. Signal 1576 should have been Flashing Yellow.</p> <p>Under the direction of the Signal Supervisor, the signal system was inspected and thoroughly tested. All tests showed the signal system to be working as intended with no exceptions. The 1576 signal displayed Flashing Yellow when same lineup was made as was present for the 1LBMFT1-20.</p> <p>The following evening, at the same time of day, the Signal Supervisor returned to the location and observed that the signal had no phantom indication and was clearly visible.</p> <p>The signal system was returned to service on September 22, 1995 at 9:40 PM.</p>									
49	9/25/1995	UP	CTC			UP3970	Signal Head	Kansas City, KS	N
<p>Phantom Signal - Due to Sun Angle</p> <p>On September 25, 1995, at 07:50 (CDT) on the Kansas City Terminal Subdivision, westbound KSSI-25 on Track No. 3 at Control Point K006 reported the westbound signal Red over Yellow for his movement from Track No. 3 to Track No. 2 and the switch was lined against him.</p> <p>An investigation revealed the sun reflections in the lower signal head diffused the Red signal and made it appear to give a Yellow indication.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</p>									
518	9/28/1995	SEPA	AB				Open Wire Pole Line	MP 17.5 to MP 18.6, Neshaminy Line	N
<p>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</p> <p>Nature of Failure: Engineer reported passing NB automatic signal #71 displaying CLEAR and approaching next NB automatic signal #73 displaying STOP AND PROCEED.</p> <p>Cause of Failure: Inspection of pole line conditions revealed open line conductors 73H, 75CX110 and 72A were crossed due to vegetation growth. In addition, investigation revealed single conductors at a line drop to a terminal box were bare in a bridle ring above the terminal box, grounding circuits 73H, 76H and 75CX110 and shorting an isolation transformer located at #72 automatic signal feeding 76H circuit and 75CX110.</p> <p>Corrective Action Taken: NB automatic signals 71 & 73 and SB automatic signals 76 & 72 were placed in their most restrictive condition. All brush and vegetation were removed, line wires were realigned and affected conductors in line drop were replaced. Isolation transformer feeding energy to 76H circuit was also replaced. System was tested 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?
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519	9/30/1995	CR		Automatic		Engine #2	4W Signal @ Burnham	Burnham, IL	N
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Human Error - Improper Circuit Jumper in Place

Engineer on NICTD train 509 observed signal 4W CLEAR with M/W crane occupying 2CT track circuit in interlocking. Cause was determined to be jumper placed on 2TPR relay by signal maintainer who was working with M/W equipment. Jumper removed after train moves were completed.

520	10/2/1995	SP	AB			Switcher JOB 891	Signal 9040	Phoenix, AZ	N
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Vandalism - Pole Line

On October 2, 1995 at approximately 2:00 AM, Engineer operating switcher JOB 891 traveling east reported that signal 9040 was Green while switcher JOB 888, making a move at 15th Avenue, had switch 374 lined for the team track but was clear of the fouling section. Signal 9040 should have been Red.

Under the direction of the Signal Supervisor, the signal system was thoroughly tested. The cause of the problem was found to be a line wire wrap between line wires 9040H, 9040D and 9034H west of 15th Ave. near MP R-905.1. Marks found on the pole near the wrap indicated it had been hit by a truck, thus causing the wrap (the line wires were strung too tight to have been wrapped due to high winds).

The line wires were unwrapped. The signal system was tested and found to be working as intended with no exceptions.

The signal system was returned to service on October 2, 1995 at 8:30 AM.

521	10/3/1995	SP	CTC			SP 1CPKIC-01	Signal 1EA	Pueblo Jct., CO	N
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Phantom Signal - Due to Sun Angle

On October 3, 1995 at approximately 5:23 PM, the 1CPKIC-01 moved eastward past signal 1EA with the switch lined reversed against him and left the switch out of correspondence with bent rods. When questioned later, the Engineer advised that he had been stopped at the signal for an opposing train, and after it cleared the switch, he saw the signal 1EA display a Red over Yellow and he proceeded without observing that the switch was lined against him. He stopped at the next signal 2EA until the dispatcher cleared it and then proceeded without realizing that he had damaged the switch by training through it.

The Signal Supervisor repaired the switch machine and thoroughly tested the signal system. He found it working as intended. The Digicon system showed the switch reversed and the signal 1EA at STOP when the 1CPKIC-01 went by the signal.

The Signal Supervisor observed the signal at the same time the next day and found that signal 1EA was washed out by the sun shining into it. He installed phankills on the eastward signals at this location.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
522	10/11/1995	CP		Automatic		See Below	4RC & 4L Signals	Dewey Indiana	N
<p>Cause</p> <p>Narrative</p> <p>Human Error - Improper Circuit Jumper in Place</p> <p>At approximately 1400 hrs on October 11, 1995, CP Rail System Maintenance of Way employees were raising the crossing at N. 25th Street, CSX Dewey Diamond, in Dewey, Indiana. The gang was working under Form B authority obtained by the foreman. Because of the intermittent shunting of the equipment, the Signal Maintainer held up the 2 LT relay. CSX trains were operating over the Diamond, on signal indication with the 2 LT relay held up.</p> <p>It has been explained to the Maintainer that this is not an acceptable practice. Disciplinary action will be taken.</p>									
523	10/18/1995	CR	CTC			Train SENS-7, Engi	Signal P383	Shippensburg, PA	N
<p>Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)</p> <p>Engineer on train SENS-7 reported that signal P383 displayed a CLEAR aspect with signal 15W at CP Ship displaying MEDIUM APPROACH. Problem was determined to be false energy on L15APC circuit due to grounded and crossed aerial cable conductors between Loc "C" and Loc "D" at CP Ship. Cable removed from service, new cable installed, signal system tested and returned to service.</p>									
524	10/22/1995	SP	AB			SP 1HOCMX-20	Signal 1496	Lafayette, LA	N
<p>Human Error - Field Wiring Error, Inadequate Service Testing</p> <p>On October 22, 1995 at approximately 11:45 AM, Engineer operating train no. 1HOCMX-20 traveling east, reported that signal 1502 at the West End of Scott was Yellow, signal 1496 was Green and signal 1482 was Red. Signal 1496 should have been Yellow.</p> <p>Under the direction of Signal Supervisor, the signal system was put to STOP and thoroughly tested. It was found that the coil wires on the 1496HR relay had been transposed, thus causing the signal to display the incorrect aspect.</p> <p>After the wires were switched to their proper positions, the signal system was again tested and found to be working as intended with no exceptions.</p> <p>The signal system was returned to service on October 22, 1995 at 2:00 PM.</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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525	10/25/1995	LI		Remote		1624	Signal Circuitry	Divide Interlocking	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

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

Corrective Actions:

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

1	10/29/1995	BNSF	CTC			BN 9509	Wiring Error	West Antelope, WY	N
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Human Error - Field Wiring Error, Inadequate Service Testing

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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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526	10/30/1995	CP		Remote		CP 5502	Equip. VHLC - 2WB Sig.	Nasohata West (MP 114.8), Oconomowoc,	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

Train #571 (CP 5502) reported that the signal out of the siding at West End of Nashatah (MP 114.8) with switch lined for normal move (main line). Engineer reported signal came in for second then went Red.

Dispatcher had Amtrak #7 (westbound) go thru Nashotah West and was going to bring #571 out of siding after #7 but forgot to line switch reverse before requesting a signal clear with a call-on. When he realized what he had done he sent out cancel signal request. We had Electronic Tech in Control Office pull the logs on the Nashotah West location and they confirmed what the dispatcher said that he had done. It showed that the 1WA which is the main line signal, did clear for a second before the dispatcher sent out the signal cancel request. The location at that time, went into time because the East End of Nashotah was lined into the West End of Nashotah.

We tried to duplicate the moves that took place with the dispatcher and shunts but were unable to get the 1WB to show CLEAR. Also tried with another west bound train. All batteries at location showed free of any grounds.

The logs pulled showed that the 1W B signal never showed CLEAR until the switch was lined reverse and then dispatcher requested the signal. Also pulled logs from VHLC and they agreed with logs from office.

The following day when the Engineer came back on duty, I talked with him and told him of our testes [sic] and logs he said that he would hate to think that he was looking at the wrong signal but could have been. The train was sitting back from the signal five or six car lengths. It was also dark and they had been sitting in siding for about one hour twenty minutes.

After talking with the Engineer and making all tests and checking logs I put the 1WB signal back in service.

No further problems have occurred.

527	10/30/1995	SP	CTC			SP 5HPHLE-30	Signal 6420E	Kyune, CO	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

On October 30, 1995 at approximately 9:05 PM, Engineer operating train no. 5HPHLE-30 traveling east, reported that signal 6420E was Green, with a Red over Lunar at signal 6400E at the West End of Kyune. Signal 6420E should have been Yellow.

Under the direction of the Signal Supervisor, the signal system was inspected and thoroughly tested. All tests showed the signal system to be working as intended with no exceptions. A visual inspection of the signal, conducted over a three day period following the incident, did not show any malfunctions.

The signal system was returned to service on October 31, 1995 at 12:30 PM.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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528	11/2/1995	EJE					Track Relay	Vernon Hills, Illinois	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On subject interlocking, a track circuit BNWLP, in the fouling section is so arranged that when the Electric Lock installed on the switch allowing movements from the siding onto the main and into interlocking limits is unlocked or opened 1/4" from full normal, the track circuit is de-energized. Once de-energized, it de-energizes a relay that is used as the OS track. All signals on all routes are effectively slotted off with the OS relay down.

Shunt fouling wires were inadvertently installed from the main to the fouling section. When the electric locks were unlocked or opened 1/4" from full normal, the track relay BNWLP remained energized through the OS track battery, not effectively slotting off all signals.

Shunt fouling wires were removed correcting the failure.

2	11/6/1995	BNSF	CTC			Train #1347	Signal 2136.3	Galva, IL	N
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Vandalism - Pole Line

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.

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.

Correction: Removed all copper wires that were hanging down in the open signal wires. Made operating tests and left working ok.

529	11/6/1995	SP	AB			Pittsburg Local	Signal 391	Avon, CA	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On November 6, 1995 at approximately 5:00 PM, Engineer operating Pittsburg Local reported that signal 391 was Green with the hand throw switch at MP B-38.1 in reverse position, lined for the siding. Signal 391 should have been Red.

Under the direction of the Signal Supervisor, the signal system was put to STOP and thoroughly tested. The two wires going from the NWP relay coils were incorrectly wired to a battery source coming from an aerial cable, thus, bypassing the U-5 switch circuit controller box at the West End of Avon, and causing the NWPR to remain energized when the switch was reversed.

The circuit was rewired, the signal system was thoroughly tested and found to be working as intended 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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530	11/7/1995	SP	AB			SP 1BSMFF-05	Signal 14619	Ancho, NM	N
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Maintenance - Wiring Chewed by Rodents

On November 7, 1995 at approximately 7:40 AM, Engineer operating train no. 1BSMFF-05 traveling west, reported that signal 14619 at W. Ancho remained Green while the 1WCKCQ-04 traveling east was occupying all 3 track circuits on the main track at W. Ancho, and that the signal had remained Green the whole time that the 1WCKCQ-04 was approaching the West End of Ancho.

The Signal Engineer investigated and found that a mouse had eaten through the battery and lamp wires insulation, inside the signal junction box. A battery wire was touching the Green lamp wire which could cause the lamp to display Green even when the block is occupied.

[Signal personnel] replaced the bare wires, sealed the box, made full operational tests with shunts, tested relays, and meggered cables. The signal system was then working as intended and was returned to service.

531	11/8/1995	KCS	CTC			746	?	Noel, MO	N
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Phantom Signal - Due to Foreign Light Source

At 23:03 hrs on 11/8/95 northbound Extra Train 0006 of the 7th reported going by signal #2046 (approach signal to South Noel) with a CLEAR indication and arrived at South Noel with a Red absolute signal. The train got by the absolute signal but was able to stop before any further incident. Please review attached statement from the Signal Supervisor for more information from testing and from crew interviews. Also find attached a consist report and a train report from dispatchers office.

[From the Signal Supervisor's report] The report was investigated by the Signal Maintainer and myself. We were unable to reproduce the reported conditions. Also nothing was found that would contribute to the reported occurrence, such as grounds or relays out of spect [sic]. We did find that at a place about a mile north of signal #2046 where a street light could possibly be mistaken for a Green signal off in the far distance. This light might very well be mistaken for a signal in the distance if someone was not alert and was not sure of his location.

While later talking to the engineer, I asked him about this possibility, but he did not think so. The brakeman told me that he did not see the aspect of the approach signal which leads me to believe that the crew was not calling signals that night.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
50	11/9/1995	UP	CTC			UP2324	None	Marysville, KS	N	
			Maintenance - Improper Adjustment, Track Circuit							
			On November 8, 1995, at 11:15 (CST) on the Marysville Subdivision, westbound LNE75-08 flagged by Red signal at Z150. The westbound train ahead of LNE75-08 was stopped by the Signal No. 153.7 with 2 1/2 cars of the train east of the insulated joints. As LNE75-08 approached Signal No. 153.7, his cab signal upgraded from Red to Yellow.							
			An investigation revealed the current of the ACS east of the insulated joint at signal No. 153.7 was 3 amps which allowed the current to pass under the stopped 2 1/2 cars upgrading the ACS in LNE75-08.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
32	11/12/1995	NS	CTC			8592-6520	Poleline	Bradshaw, WV	N	
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)							
			At approximately 1:40 AM, Train No. Q16U710, traveling westbound on the Dry Fork Branch, reported they observed intermediate signal I-125 change from RESTRICTING to CLEAR for about a minute and a half then go to APPROACH. This occurred as light engines running as Train No. 960U7 were reportedly passing the controlled signal ahead at Bradshaw, MP I-11.5.							
			Signal personnel were called to investigate and upon arrival were unable to duplicate the problem. However, it was observed that the pole line was storm damaged at five locations between Mileposts I-11.5 and I-12.5. Line wires that controlled the aspect of signal I-125 were either shorted or broken. Five trees were then removed from the line, and the wires were repaired. All involved equipment was tested and an operational check was made on the signal. The signal system was found to be operating properly and was released for service.							
			Analysis of the line wires damaged by the fallen trees indicated that possibly leakage through the wet trees laying across the line could have conducted enough current to have picked the 125 HD relay. This condition would only have been a possibility while the OS circuit at Bradshaw was de-energized which it was for about a minute and a half while Train 960U7 was passing. It was concluded that the factors present could have caused signal I-125 to display a false proceed aspect.							
532	11/12/1995	URR		Remote		Engine #7	---	Signal 176	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			On November 12, 1995, signal 176, a southbound controlled signal, was reported by Engine 7 to have displayed a CLEAR (Green) instead of a MEDIUM CLEAR (Red over Green). The system is a color light system with light-out relay circuits. A printout of controls and indications was obtained from the office system to verify that crossover 187 was in the reverse position. The light-out relays were checked along with the 176 AHR relay and its associated circuits. The relays were tested and all pertinent cable meggered. The exact conditions that took place on November 12 were duplicated, but we could not duplicate the failure. There were no grounds found on 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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33	11/15/1995	NS	CTC			3274	Poleline	Carbo, VA	N
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Failed Equipment or Device - Object In/Through Slide Fence - Not Indicating

At Approximately 7:05 PM, Train No. S90U715, engineer and conductor unknown, was traveling eastbound when they saw a tree that had fallen over the top of a slide fence and was blocking the track near MP CV-435. The train was stopped short of the tree. The train had been running on a signal to PROCEED, observed at Carterton MP CV-436.2.

The signal maintainer and a track crew were called to remove the tree and check the slide fence. The maintainer observed that the slide fence trigger near the point where the tree fell was tripped. Once the tree had been removed and the train had left the block, the block light showed CLEAR, even though the trigger was still tripped.

The trigger that was tripped is one of several spaced along a quarter mile long slide fence. The slide fence circuit runs along the top of the slide fence poles mounted on insulators. The single break slide fence circuit loops through each trigger and then returns to the slide fence relay via the signal poleline which was on the opposite side of the track from this fence. The falling tree had broke the line wire at the top of the fence and then hit the fence tripping the trigger. Both ends of the line wire were shorted to the slide fence, thereby bypassing the tripped trigger. Insulation had been stripped from the line wire as it jerked through the insulators before the tie wires broke. This allowed the line wire ends to make electrical continuity with the steel fence material.

Repairs were made to the line wire, the trigger was reset and tests were made on the signal system before returning it to service.

533	11/16/1995	SP	CTC			SP 1LBHOT-15	Signal 50RA	Akela, New Mexico	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

On November 16, 1995 at approximately 2:50 PM, Engineer operating train no. 1LBHOT-15 traveling east, reported that signal 50RA at the West End of Akela was Green when it first came into view, then changed to Yellow when the train was a mile away, and heading towards the signal.

Under the direction of the Division Signal Engineer, the signal system was put to STOP and thoroughly tested. All tests showed the signal system to be working as intended with no exceptions.

The signal system was restored to service on November 17, 1995 at 3:30 AM.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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534	11/16/1995	SP	AB			Work Train 7435	Signal 4279	Klamath Falls, OR	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On November 16, 1995 at approximately 3:00 PM, Engineer operating work train no. 7435 traveling east, reported that while only half of his train had passed signal 4279, he observed that signal 4279 was Yellow instead of Red.

Under the direction of the Signal Supervisor, the signal system was thoroughly tested, and it was found that the 4274T and 4274AT track circuits did not slot the 4279H control. The problem was immediately corrected; the signal system was thoroughly tested and found to be working as intended with no exceptions.

The signal system was returned to service on November 16, 1995 at 6:30 PM.

535	11/17/1995	FEC			ATC	426	Not Determined	Espanola, Florida	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

On November 17, 1995 at approximately 19:28 hours train no. 117 engine no. 426 reported cab signal remained at APPROACH HOME Y/R when engine 426 entered the approach code change block located at 1500 feet in advance to home signal 1S at CP South Dorena located at Milepost MJ 28.8. The cab signal should of changed to STOP R/Dark when entering this block. After thorough investigation on 11/17, 11/18, 11/22, 11/27 and 11/28 the events that occurred on the evening of 11/17 could not be duplicated. Extensive testing was performed on the locomotive equipment [at] the field location. A grounded track wire on the 1NBRB east rail and a ground on the N12 battery buss measuring 6 amps at the time of the incident were the only exceptions noted with the normal functioning of the system. The N12 ground was cleared on 11/17 and the track wire on 11/18. With duplications of these grounds during testing no devices failed that would of caused the incident. A recorder board has been installed on the 1NB Electrocode unit and the locomotive CSR unit has been forwarded to the factory for further testing.

51	11/18/1995	UP	AB	Manual	ATS	EX140	None	Barrington, IL	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On November 18, 1995, at 09:15 (CST) on the Harvard Subdivision, southbound train EX140 had a Red over Green signal for movement from No. 3 track to No. 2 Track at CP T031, Barrington, with a northbound train lined into No. 2 track at CP N019, Seeger.

An investigation revealed a circuit design error in the traffic locking circuit at CP T031.

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

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
536	11/19/1995	SP	AB			SP West Local	Signal 9064	Phoenix, AZ	N
			Human Error - Field Wiring Error, Inadequate Service Testing						
			<p>On November 19, 1995 at approximately 3:57 AM, the Engineer operating train West Local traveling east, reported that signal 9064 was Green with a train still occupying the block ahead of him. Signal 9064 should have been Red.</p> <p>Under the direction of the Signal Supervisor, the signal system was put at STOP and thoroughly tested. It was found that during the relocation of the hand throw switch at MP 906.6, two track circuits were left out of the signal system. The problem was immediately corrected, the signal system was thoroughly tested and found to be working as intended with no exceptions.</p> <p>The signal system was restored to service on November 19, 1995 at 4:00 PM.</p>						
537	11/20/1995	SEPA		Remote			Unknown	Sig. 20L, Newtown Jct. Int., MP 6.2	N
			Scenario Reenacted, Unable to Duplicate, No Defects Found						
			<p>Nature of Failure: Engineer reported passing signal 20L displaying MEDIUM CLEAR and approached next signal, signal 4W at CP Nice, displaying STOP.</p> <p>Cause of Failure: Could not repeat the condition, therefore could not verify that the condition existed. It should be noted the signal 20L does not display a MEDIUM CLEAR for the route taken.</p> <p>Corrective Action Taken: Performed all necessary tests and inspections to determine if the condition existed. It was determined that the system was working as intended and that the reported condition did not exist. Therefore no corrective action was required.</p> <p>NOTE: From the conclusions drawn it is the position of SEPTA that a False Clear condition did not exist and the condition is only alleged.</p>						
52	11/28/1995	CSXT				NPST-26	None	Orinosa, Utah	N
			Vandalism - Instrument Case, Cable, or Junction Box Damaged						
			<p>On November 28, 1995, at 13:45 (CDT) on the Elko Subdivision, westbound train NPST-26 had a Green aspect at Signal No. 830.1, a Flashing Yellow aspect at Signal 827.7 and a diverging Red over Lunar aspect at Signal CP F826.</p> <p>An investigation revealed the signal case at MP 827.7 had been run into by a vehicle and upset relays RLPR, 180CTR, and DRAR which had to be replaced.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</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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3	12/1/1995	BNSF	CTC			1-4108-1	Int. 1248.2	Radnor, MT	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

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.

538	12/2/1995	SP	CTC			1EUDOQ-KO1, SP	Signal 50LB	Heather, Oregon	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

On December 2, 1995 at approximately 9:13 AM PST, Engineer was lined into the siding at East Heather for a meet with the 1LABRF2-01. The Digicon system showed that signal 50LB at West Heather was at STOP and the switch was normal with signal 50RA cleared for the 1LABRF2-01. [Engineer] later claimed that the signal 50LB was Green, after he ran through the switch and proceeded to East Wicopee.

The Signal Supervisor repaired the damaged switch and then thoroughly tested the signal system, and found it working as intended with no defects.

Signals were returned to service on December 3, 1995 at 5:00 PM PST.

34	12/4/1995	NS		Automatic		Unknown ICG Engi	Design	Hattiesburg, MS	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

At approximately 1:00 AM, northbound Train No. 294, Engine NS 6651, stopped short of its track warrant limits at the approach signal to Hattiesburg automatic interlocking. Train 294 was held to allow an ICG switching move to be completed in the vicinity of the interlocking. As the ICG switching movement progressed, it moved out onto the NS main track through a switch facing away from the interlocking. This was done under track warrant authority by NS dispatcher at Birmingham, and when the switch was reversed by ICG, a stick circuit was set which would normally have been used to allow a key stand clearing for ICG movement across the interlocking. However, the stick circuit was held up by Train 294's presence on the approach circuit at the time the stick was set. Once Train 294 received a track warrant to proceed and observed they had a CLEAR indication at the approach signal, the engineer started movement toward the interlocking. Meanwhile, the ICG switching movement that had completed their switching came up to the interlocking on their track and checked the indication on their key stand. Because the stick circuit was still up, the ICG crew had a CLEAR indication that meant that they could activate the pushbutton. When the button was pushed the ICG got a signal to proceed across the interlocking, which they did. When the ICG move occupied the "OS" it illuminated a holding signal for Train 294, and that train again stopped until the ICG movement cleared the interlocking.

The design problem that permitted this scenario was corrected, the signals were checked out and returned to service.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
20	12/7/1995	CSXT	CTC			Train R27205	None	Troy, OH	N	
			Phantom Signal - Due to Sun Angle							
			On December 7, 1995 at approximately 1240 hours, the crew of northbound train R27205 alleged that they had a STOP AND PROCEED on the northbound absolute signal (21R) at the South End of Troy. This signal was not requested by the train dispatcher at this time. Signal system was removed from service and investigation began. Signal and Transportation personnel concluded that the A marker appeared to be dimly lit due to the effects of sunlight. An alternate hood was placed on the signal to correct the sunlight and signals were restored to service.							
53	12/8/1995	UP	CTC			SP8353	None	Menard Junction, IL	N	
			Human Error - Improper Equipment Installed							
			On December 8, 1995, at 10:00 (CST) on the Chester Subdivision, northbound FHOCH-06 had a Green signal at CP D061 with intermediate northbound signal 58.3 displaying Red and the track north of Signal 58.3 occupied.							
			An investigation revealed a neutral relay was installed in lieu of a biased relay in the "D" circuit at CP D061.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
4	12/12/1995	BNSF	CTC			Train 01-131-12	Power Switch	Afton, OK	N	
			Human Error - Improper Circuit Jumper in Place							
			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.							
540	12/18/1995	AMTJ		Remote		Engine 1069	Signal R58	Sommerville,MA	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			At Swift Interlocking on the Fitchburg mainline in Sommerville, MA, lite engine 1069 reported receiving a SLOW CLEAR on signal R58 lined to a non-sigaled track. Investigation revealed that the R58 DPR circuit was not selective enough and allowed a SLOW CLEAR to be displayed into a non signal track. The R58 signal network has been revised and all appropriate tests were performed leaving the R58 signal working as intended.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
539	12/18/1995	SP	CTC			SP 1WCPBM	Signal 6232	Mecca, CA	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			On December 18, 1995 at approximately 7:38 AM, train crew operating the 1WCPBM traveling east, reported that approach signal 6232 went from displaying a Yellow aspect to a Flashing Yellow aspect, with them lined into the siding at the West End of Mecca.							
			Under the direction of the Signal Supervisor, the signal system was inspected and thoroughly tested. All tests showed the signal system to be working as intended with no exceptions. The light bulb was replaced in the 6232 signal, and the signal system was restored to service on December 18, 1995 at 8:30 AM.							
5	12/19/1995	BNSF		Remote		1-G83-18	Alleged 1NA Signal	21st ST. Interlocking, Tacoma, WA	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			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.)							
541	12/20/1995	SP	AB			1BSMFF19 West	Wire Eyelet	West Missler, Kansas	N	
			Failed Equipment or Device - Interior Wiring							
			On Dec. 20, 1995 at 7:55 PM Engineer operating the 1BSMFF-19 reported that the westward signal 3977 on the main track was Green with the switch reversed at West Missler, Kansas. The Signal Supervisor tested the signal system and verified that signal 3977 was Green with the switch reversed. He found that the insulation on the ring eyelet or terminal had failed causing the number 4 front contact post to be connected falsely to the number 4 back contact of the 2NWPR relay thus allowing the 3977 HPR relay to remain energized when the switch was reversed.							
			The defective eyelet was replaced and the signals were tested and found to be working properly. The signal system was restored to service at 1:00 AM on December 21, 1995.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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35	12/22/1995	NS	CTC			3920	Signal	Jacksonville, IL	N
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Phantom Signal - Due to Sun Angle

At approximately 12:58 PM, Train No. D33D westbound was waiting in the siding at Arnold to meet an eastbound train. Train D33D was stopped about four (4) car lengths east of the westward signal, 56L. After the eastbound train passed on the Main Track, the crew on D33D observed signal 56L display Yellow over Yellow, ADVANCE APPROACH, for their move. The engineer started his train moving out of the siding. Just before reaching the power switch, the engineer observed that it was lined against his movement, made a normal stop but ran through the switch with his entire train. The dispatcher had not requested a route for D33D to leave the siding.

Signal 56L is a double mast bracket signal located to the right of the Main Track. Westbound movements on the main are governed by signal heads 56LA & 56LB on the right mast; the siding by signal heads 56LD & 56LE on the left mast. All heads are US&S H-2 with 9 volts (AC or DC) on the bulbs, and only the D & E heads (the siding signal) equipped with 30-degree deflecting lenses. A long sweeping right-hand curve is transversed approaching the west end of the siding. ADVANCE APPROACH is a valid signal to leave the siding.

The false Yellow over Yellow was observed on the 56L E&D heads by the investigating signal personnel. When compared to the Main Track signal Red over Red, the siding signal did appear Yellow over Yellow from an engine until it backed more than 150 feet back from the shunting joints. Tests revealed that this was a phantom signal, caused by sunlight reflecting off the snow covered ground in the early to mid-afternoon. Further experimentation showed where the removal of the deflecting lenses was the only sure way to prevent this phantom signal from occurring. The lenses were removed and the signals re-aligned to compensate. Signals were 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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36	12/24/1995	NS	CTC			Unknown	Insulated Joint	Stearns, KY	N
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At approximately 9:45 AM, Train No. 108 was moving northbound on track #2 at Stearns, KY when they observed an APPROACH DIVERGING signal for their movement. Knowing they were to meet opposing southbound traffic at the end of the double track (the next signal), they expected to get an APPROACH indication at Stearns. Engineer reported the incident to the dispatcher and proceeded on to the end of double track at Whitley where he had a STOP indication as expected.

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

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

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

6	12/30/1995	CSXT	CTC			None	Sig LA	West Purcell, OK	N
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Vandalism - Signal Mechanism Shot - Stuck in Position

Dispatcher reported signal LA, Main Line westward control signal, West End Purcell, OK cleared on its own and could not be taken down. Maintainer observed signal LA displaying a very dim Yellow aspect. Maintainer found signal had been shot, damaging the H-5 relay. Maintainer replaced H-5 relay and tested signal system. There were no trains that viewed the signal before the signal was placed to STOP by the signal maintainer.

542	12/30/1995	GTW	APB			6419	Block Line	Kingsbury, IN	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

High wind conditions caused signal control wires to wrap. On December 30, 1995, at 22:30 hours, GTW train 172 East following behind train 144 East reported that ABS signal 75.4 went from a RESTRICTED SPEED indication (GTW Rule 290) to a PROCEED indication (GTW Rule 281). Split arm damaged by tree at MP 77.2 forced signal control wire "H" wire to make contact with signal control wire "D."

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
543	1/3/1996	KCS	CTC			KCS 621	?	Converse, LA	N	
			Phantom Signal - Due to Foreign Light Source							
			<p>At 17:00hrs on 1/3/96 an Extra 621 North the MPASH1 with Engineer, Conductor, Brakeman Trainee, and Road Foreman of Engines was traveling north on the main line at Mile Post 611.50 South Converse and received a CLEAR signal indication. Upon arriving at North Converse, Mile Post 609.64, they realized there was a dark north bound signal. When the train was stopped the Brakeman Trainee stepped out of the cab and looked back south and could see the south bound main line signal and reported it to be CLEAR. The other crew members stepped out to look at the signal and didn't see the signal CLEAR, the brakeman said that it must have went out. [The Brakeman Trainee] has approximately 8 weeks service with the KCS RailRoad. The Signal Supervisor and Signal Maintainer performed all applicable tests and the condition could not be reproduced. The following evening the Signal Maintainer went to the site again on 1/4/96 around the same time of the incident and found that there was a green porch light in the background of the signal at a house near the track, (see Picture Attached) that could have possibly been mistaken for a Green signal. The Signal Maintainer talked to the home owner, explained the situation and got him to change the light bulb to a regular white light. Please find attached a picture of the location, the test records and statements from the Signalmen performing the test and a train report including consist.</p>							
54	1/5/1996	BNSF	CTC			Amtrak 1796	None	Ostrander, WA	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			<p>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 ine 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.</p> <p>No exceptions taken to the signal system.</p>							
544	1/10/1996	SP	CTC			SP 1RVASM-08	Signal 6022	East Mounds, CO	N	
			Phantom Signal - Due to Sun Angle							
			<p>On January 10, 1996 at approximately 4:20 PM, train no. 1RVASM-08 traveling east, was in the siding at the east end of Mounds waiting for train no. 10ANSF to pass on the main. After the 10ANSF passed by signal 6022 on the main line, the Roadmaster noticed that signal 6022 appeared Green. The train crew on the 1RVASM-08 also reported that the signal appeared Green.</p> <p>Under the direction of the Signal Supervisor, the signal system was inspected and thoroughly tested. All tests showed the signal system to be working as intended with no exceptions. [The Signal Supervisor] returned the next day at about the same time to observe the signal and noted that as the sun started to shine on the green lens the signal appeared to be Green. Phankill screens were installed on all the eastbound signals at East Mound to correct the problem.</p> <p>The signal system was restored to service on January 10, 1996 at 11:00 PM.</p>							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
545	1/15/1996	CR	CTC			Amtrak #277, Engin	Signal 1212N	Styvesant, NY	N
<p>Cause</p> <p>Vandalism - Instrument Case, Cable, or Junction Box Damaged</p> <p>Engineer on Amtrak #277 reported that cab signal changed from CLEAR to RESTRICTING at cut section 122.9 and signal 4N at CP124 was Dark. Cause was found to be A2TR relay at C.S. 122.9 being inverted due to impact to instrument case from a deer which was struck by a train. Relay was found to be hanging upside down with its front and heels made while in the de-energized position. Relays were changed out and signal system tested and returned to service.</p>									
546	1/17/1996	SP	AB			Amtrak No. 14	Signal 344	Benicia, CA	N
<p>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</p> <p>On January 17, 1996 at approximately 10:03 PM, the Martinez Bridge Operator reported that Amtrak train no. 14, traveling east, went by signal 344 and that the signal remained Green after the train had passed and was still occupying the track circuit immediately behind signal 344.</p> <p>Under the direction of the Signal Supervisor, the signal system was thoroughly tested. The cause of the problem was found to be that tree branches were pushing down on the line wires causing the wires to wrap. The trees were removed, the wrap was undone and the slack wire pulled tighter. The signal system was again inspected and tested and found to be working as intended with no exceptions.</p> <p>The signal system was returned to service on January 18, 1996 at 6:47 AM.</p>									
547	1/18/1996	SP	AB			SP 1PXLAM-17	Signal 8220	Hyder, AZ	N
<p>Scenario Reenacted, Unable to Duplicate, No Defects Found</p> <p>On January 18, 1996 at approximately 7:30 AM, Engineer operating train no. 1PXLAM-17 traveling west, reported that he was approaching the west end of Hyder at restrictive speed because of a Red signal at 8219 and saw that the opposing signal, the 8220, displayed a clear H are over a restrictive D arm before the signal went into the correct position of a restrictive H over a restrictive D.</p> <p>Under the direction of the Signal Supervisor, the signal system was thoroughly tested. All tests showed the signal system to be working as intended with no exceptions.</p> <p>The signal system was returned to service on January 18, 1996 at 4:00 PM.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
548	1/19/1996	SP	CTC			Utah Rwy. Helper	Signal 6327E	Lynn, CO	N
<p>Cause</p> <p>Narrative</p> <p>Scenario Reenacted, Unable to Duplicate, No Defects Found</p> <p>On January 19, 1996 at approximately 1:55 PM, Engineer operating Utah Railway Helper Engine No. UR9002, moving east past Lynn Crossover, reported that he looked back behind his train and observed that the westward absolute signal (6327E) appeared to be displaying a Green over Red aspect.</p> <p>Under the direction of the Signal Supervisor, the signal system was thoroughly tested and found to be working as intended with no exceptions.</p> <p>The signal system was restored to service on January 19, 1996 at 8:00 PM.</p>									
549	1/20/1996	CR	AB			Train TV2M, Engine	Automatic Signal 732E	Womelsdorf, PA	N
<p>Signal Equipment and/or Circuits Flooded</p> <p>Engineer on train TV2M observed automatic signal 732E displaying a CLEAR aspect with train PIM09 ahead, occupying the block. Failure was found to be ice inside of 142 TR track relay causing relay to be held in the energized position, due to flood conditions which caused over two (2) feet of water to enter instrument case. Relay replaced, instrument case dried out, signal system tested and returned to service.</p>									
550	1/21/1996	CR	AB			No Train Involved	Automatic Signal 111W	Fleetwood, PA	N
<p>Signal Equipment and/or Circuits Flooded</p> <p>Signal maintainer observed automatic signal 111W displaying a CLEAR aspect with a train occupying the block. Failure was found to be ice inside of 111TR track relay causing relay to be held in the energized position due to flood conditions. Relay replaced, instrument case dried out, signal system tested and returned to service.</p>									
101	1/24/1996	UP	CTC			None	None	Goodwin, TX	N
<p>Phantom Signal - Due to Sun Angle</p> <p>On January 24, 1996, at approximately 1500 CST at the north end of Goodwin, Texas, on the Austin Subdivision, FRA Signal and Train Control Inspector observed the red aspect of the bottom head of the northward absolute signal fade from Red to Yellow.</p> <p>An investigation revealed that the lower head needed to be refocused; the lower head was refocused.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
551	1/26/1996	SP	CTC			SP 1LBCXT1-25	Signal 54RA	Mortmar, CA	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			On January 26, 1996 at approximately 12:00 PM, Engineer operating train no. 1LBCXT1-25 traveling east, reported that signal 54RA at the west end of Mortmar displayed a Green aspect and the next signal at East Mortmar was Red and that he had overrun the Red signal.							
			Under the direction of the Signal Supervisor, the signal system was thoroughly inspected and tested and found to be working as intended with no exceptions. Replay showed the signal at East Mortmar was not requested and the 54RAHR was de-energized with the polar contacts in the reverse position indicating that signal 54RA was Yellow when the train passed it.							
			The signal system was restored to service on January 26, 1996 at 5:30 PM.							
552	1/28/1996	CR	AB			Train HLPR 40E, En	Automatic Signal 752	Atwater, Ohio	N	
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)							
			Engineer on HLPR 40E reported that automatic signal 752 displayed a CLEAR aspect with a train occupying the block. Train moves were simulated and at no time could this condition be re-created. Upon investigation, wrapped live wires were found at mile post 75 due to tree in pole line. Tree was removed, all signal components tested and inspected. A 24-hour watch was placed on signal 752 with no exceptions taken and signal system was returned to service. A recording device was installed at signal 752 to monitor the location. Also circuit changes are being made to eliminate the pole line involved.							
55	1/29/1996	BNSF	CTC			P-CHLA1-29 Engin	FR-2	Edelstein, IL	N	
			Failed Equipment or Device - FR-2							
			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.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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80	1/30/1996	CSXT		Remote		Train Z24020	#3 Track Circuit	GTW Crossing, Toledo, OH	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On Tuesday, January 21, 1997 Norfolk Southern Train Y13 reported a RESTRICTING eastbound signal at GTW Interlocking while train Z24020 was fouling the crossing diamond.

CSXT Train Control personnel removed the signal system from service for this route. CSXT Train Control personnel investigated the incident and determined the last car of the train was bridging the track circuit between the dead section of the diamond and the insulated joints at the number 2 signal. The car length was 80 feet and the track circuit length was 37 feet 6 inches.

This route remains out of service with design changes scheduled for completion on January 31, 1997.

81	2/5/1996	CSXT	CTC			Train Q21603	Eastbound Signal	Brentwood, MD	N
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Vandalism - Signal Damaged, Caused Phantom Aspect

On February 5, 1996 at approximately 1200 hours, eastbound train Q21603 reported he had an APPROACH indication at Brentwood Intermediate (M.P. BA35) with train Q29203 ahead in block.

Signal system was removed from service.

Signal personnel investigated the incident making all required tests. It was determined that the signal has been vandalized, damaging 4 signal lamps and that the cover on the back of the yellow lamp unit was off.

Repairs were made and signal system returned to service.

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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553	2/6/1996	IHB		Remote		CP 5665	Absolute Signal 8E	CP Hill, Bellwood, IL	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

At approximately 1:15 PM, Tuesday, February 6, 1996, the Engineer of a CP train, Engine 5665, reported that absolute signal 8E momentarily cleared from Red to Green and back to Red with an opposing train setting at the opposing signal on the same track.

Our dispatcher stated and review of the control machine tapes verified that no attempt was made to clear signal 8E for his movement.

Signal personnel were dispatched to the scene and conducted a complete inspection of the interlocking and signal in question with no exceptions found. Attempts to duplicate the existing situation could not reproduce the alleged failure.

All tests and inspections were completed with no exceptions taken and no cause found.

It should be noted that at approximately 5:15PM that same day, this crew passed an absolute signal displaying a STOP indication at Grand Trunk Interlocking, Riverdale, IL, and were removed from service by CSX Transportation Management.

We have no results of any investigation or reports on their status since this is a CSX crew and Grand Trunk Interlocking is not under IHB control.

56	2/11/1996	BNSF	CTC			Train #01-127-11	Signal 116R	South Amory, MS	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
554	2/14/1996	SP	CTC			SP 1-6A-13	Signal 986	Troublesome, CO	N
			Scenario Reenacted, Unable to Duplicate, No Defects Found						
			On February 14, 1996 at approximately 5:08 PM, Engineer operating train no. 1-6A-13 traveling east, reported that signal 986 was Red over Yellow, but as he got closer, he glanced at the signal and observed that it was Yellow over Yellow.						
			Under the direction of the Signal Supervisor, the signal system was thoroughly inspected and tested. All tests showed the signal system to be working as intended with no exceptions.						
			The signal system was returned to service on February 15, 1996 at 2:00 AM.						
57	2/20/1996	BNSF	CTC			Boeing Switcher	Full Wave Rectifier	Mukilteo, WA	N
			Failed Equipment or Device - Full Wave Rectifier						
			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
			Loss of Shunt - Possible Rust or Foreign Material on Rail						
			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.						
59	3/15/1996	BNSF	CTC			Train 05 014Y 14th	Signal 320.0	Saco, MT	N
			Phantom Signal - Due to Sun Angle						
			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.						

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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555	3/19/1996	AMTK		Remote		268	Cab Signals	Cranston, RI	N
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Failed Equipment or Device - Cab Signals

Train 177 with Eng 268 traveling west track two was lined to cross from track two to track one at Cranston Int. The 2W home signal was reported to display a MEDIUM CLEAR, and as the train (177) proceeded into the interlocking, the cab signal displayed APPROACH MEDIUM. As train 177 proceeded over the crossover to track one, the enginemen on train 177 reported his cab signal upgraded to CAB SPEED. As a result of this report, Amtrak removed CAB SPEED cab signal from service on all engines operating between New Haven and Boston, and replaced the 100 Hz inverter used to produce 100 Hz for cab signals for westbound moves at Cranston. The inverter was suspected of drifting off frequency. On March 27, 1996, Amtrak re-enacted the two to one move at Cranston Int. using a test Eng 227 with CAB SPEED cab signal aspect cut in. We also re-installed the suspected defective 100 Hz inverter for this test. It was our determination from the test that the 100 Hz inverter had drifted to 89 Hz, and as this inverter is a square wave generator, there was also a significant level of the third harmonic, 267 Hz present in the same wave form. This equipment was tuned to receive 120 code at the 91-100 Hz frequency as well as the 250 Hz frequency and there were sufficient levels of both carriers to support the CAB SPEED aspect at the 120 code rate. The "Fifth Aspect" on-board equipment supporting the CAB SPEED cab aspects remains out of service as of this date and is being re-evaluated. This interim "Five Aspect" on-board equipment does not perform a final "alternating carrier" check as does the full Nine-Aspect cab signal equipment does. We will advise you of our corrective action and our intent to re-establish the interim CAB SPEED cab signal aspect to service.

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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94	3/20/1996	NS	CTC			8534	Human Error	Wytheville, VA	N
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Human Error - Field Wiring Error, Inadequate Service Testing

At approximately 8:45 AM, Train No. 111 was eastbound at the west end Wytheville siding and observed eastward signal 116R displaying CLEAR for their train. Train No. 227, at that time, was approaching and passing westward signal 118L at east end Wytheville siding. Signal 118L was displaying DIVERGING APPROACH for No. 227's move into Wytheville siding. Engineer on No. 111 was aware of his impending meet with No. 277 at Wytheville and knew he should have seen an APPROACH indication on signal 116L, therefore he stopped his train at the west end and reported the incident.

Signal personnel were called and on arrival were able to duplicate the reported situation. With eastward signal 118R at east end Wytheville displaying STOP the advance signal, 116R, at west end Wytheville did display CLEAR instead of APPROACH. The problem was traced to being caused by different AC power sources feeding the local and control coils on the signal control relay (116R BP), a three position AC vane relay, at west end Wytheville.

The signal circuits on this district are AC type, fed by a 4800 volt distribution line on the poleline. There are three substations between Bristol and Radford, Virginia which can all be feeding portions of the line if separated by sectionalizing switches which are spaced at about every seven miles along the poleline. One of these sectionalizing switches is located between the switches at Wytheville. That set of switches had been left open after storm trouble repairs the previous night, with the west end being fed up from Marion and the east end fed down from Radford. The original configuration had been that the W-BX110 which went through the 118R HR at east end to select control phasing on the 116R BP circuit was off the same (west) side of the switches that fed the local winding at the west end. When a transformer had burned up back in mid-1994, the W-BX110 line had been incorrectly tapped onto a transformer that came off the east side of the switches. Thus the condition was at that time set up to allow the two coils of the 116R BP relay to be fed from two separate sources if these sectionalizing switches were ever left open and fed from two different power companies. The fact that the two power feeds happened to be out of phase, led to the 116R BP relay receiving what looked like the proper control to display a CLEAR signal when the east end controlling relay was sending what was meant to be an APPROACH.

Since this territory is to be converted to electronic track circuits this year, the switches were removed from service, and locked in the closed position. The signals were returned to service after appropriate testing.

Since this territory is to be converted to electronic track circuits this year, the switches were removed from service, and locked in the closed position. The signals were returned to service after appropriate testing.

60	3/31/1996	BNSF	CTC			106 of the 30th	Bare Copper Wire Bridging HD and DD	Between Radnor and Brimstone	N
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Vandalism - Pole Line

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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
61	4/3/1996	BNSF	CTC			None	Track Circuits	Bristol, IL	N	
			Maintenance - Improper Adjustment, Track Circuit							
			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.							
102	4/9/1996	UP	AB			LTN71/09	H-Relay	Near Mitchell, Wisconsin	N	
			Vandalism - Instrument Case, Cable, or Junction Box Damaged							
			On April 9, 1996, at approximately 22:00 (CDT) on the Milwaukee Subdivision Westbound LTN71/09 was stopped with 15 cars passed westbound signal 80.13 was observed displaying a Yellow signal.							
			An investigation revealed that vandals had destroyed the signal equipment including several relays in the signal house at signal 80.13. The "H" Relay was broken and stuck in the up position.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
103	4/19/1996	UP	AB			FARWRC-15	Spring Switch	Woolridge, Missouri	Y	
			Failed Equipment or Device - Switch Components Damaged by Dragging Equipment							
			On April 19, 1996, at 2008 CDT on the River Subdivision, eastbound FARWRC-15 accepted signal 1570 with a CLEAR aspect at the west end of Woolridge and derailed the lead unit on the spring switch which was not in the full normal position.							
			An investigation revealed that the previous train, westbound LNJ57-19, had come out of the siding with dragging equipment and bent the switch circuit controller lug and connecting rod in such a manner that the switch point was obstructed and held gapped open from normal while the switch circuit controller indicated normal.							
			The signal system was restored to proper operation, and all applicable tests were performed.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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556	4/25/1996	CR		Remote		Train ELBN-5, Eng.	4W Signal at CP-Hick	Indiana Harbor, IN	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

Engineer on ELBN5, westbound on #3 track, received a LIMITED CLEAR aspect on the 4W signal at CP-Hick with the rear car of BRSE5 occupying #2 track foul of his route. Upon investigation, it was found that the location of the fouling point insulated joints east of #13 switch on #2 track did not provide sufficient track centers through the fouling section to prevent interference with trains on the adjacent track. Changes were made in the home signal network to prevent a signal from being displayed if this section of track is occupied (8T circuit #2 track).

Signal system was tested and returned to service.

82	4/26/1996	CSXT	CTC			Train	None	CT Junction, Cincinnati, OH	N
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Human Error - Signal Personnel Introduced False Energy into Signal System During Testing

On April 18, 1996 at 0630 hrs Train Y322-17 reported receiving an APPROACH signal at signal 27L into a standing cut of cars. The signal system was removed from service. Signal personnel performed test and inspection and it was determined that a violation of operating procedures was evident with the Train Director and Signal Employees who were performing tests at this location. Investigation is pending. Signal system was returned to service.

557	4/29/1996	SP	CTC			1MNGVCA-27	Signal 1539	E. White City, Kansas	N
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Maintenance - Rain Entering Signal Case

On April 29, 1996 at approximately 7:45 AM, Engineer operating train no. 1MNGVCA-27 traveling west, reported that signal 1539 was Yellow over Yellow when it should have been Yellow over Dark.

Under the direction of the Signal Supervisor, the signal system was immediately put to STOP and thoroughly tested. It was found that the Signal Maintainer working on the Electrocode box at that location the previous night, in the rain, had trouble keeping the box and the cards within dry. The wet cards caused an intermittent malfunction of the Electrocode resulting in the incorrect signal display.

When repeated attempts at drying the cards in the field were not satisfactory, the box and all of the cards were replaced. The signal system was thoroughly tested and found to be working as intended with no exceptions.

The signal system was returned to service on April 29, 1996 at 5:30 PM.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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558	4/30/1996	SP	AB			1CVSHC-27	Signal 4926	Bridgeport, Kansas	N
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Maintenance - Switch Shunt Wires Broken

On April 30, 1996 at approximately 8:00 AM, Engineer operating train no. 1CVSHC-27 traveling east, reported that signal 4926, at the west end of Bridgeport, was Green when it should have been Red due to the switch being reversed.

Under the direction of the Signal Supervisor, the signal system was put to STOP and then thoroughly tested. It was found that when the stock rail was replaced at West Bridgeport siding on April 29, 1996, shunt wires from the stock rail to the switch circuit controller were left disconnected resulting in the false proceed.

Switch shunt wires were connected, and the signal system was thoroughly tested. All tests showed the signal system to be working as intended with no exceptions.

The signal system was returned to service on April 30, 1996 at 11:00 AM.

559	5/9/1996	CR	AB			Train YIFE11, Engin	Automatic Signal 143.1	Sharon, PA	N
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Human Error - Field Wiring Error, Inadequate Service Testing

Conductor on YIFE11, westbound on #1 track observed automatic signal 143.1 upgrade to a CLEAR aspect with the handthrow switch and derail at MP 81.6 in the reverse positions. Upon investigation, it was found that the N81.16WP1A and the 81.16WP1A wires were transposed in the circuit controller at the derail.

The wiring problem was corrected and all applicable tests were made. An investigation is being conducted to determine responsibility.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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95	5/11/1996	NS	CTC			8951-8955	Human Error	Williamson, WV	N
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Human Error - Field Wiring Error, Inadequate Service Testing

At approximately 7:10PM, Train No. 195U110 had uncoupled from its train on the Old Passenger Main and pulled west of the 82L signal on Main 2. The Bluefield dispatcher lined a route for No. 195 to move east toward the SV Main, and Signal 82L indicated DIVERGING APPROACH DIVERGING. Because the next signal in this route, 92L, was at STOP, the 82L signal should have displayed DIVERGING APPROACH. Train 195 was safely stopped before passing the 92L signal, and signal personnel were notified.

Signal 82L is a color position type. DIVERGING APPROACH is represented by Red-horizontal over Yellow-45 degrees. DIVERGING APPROACH DIVERGING is represented by Red-horizontal over Flashing Yellow-45 degrees. The incident was duplicated by signal personnel. It was evident that any time 82L was setup to display DIVERGING APPROACH, the bottom head would flash making the signal incorrectly indicate DIVERGING APPROACH DIVERGING. This was caused by the improper hookup of a flasher that had been replaced three days before. The flasher that was replaced was of a different manufacturer than the one that replaced it. Though either flasher was capable of flashing the aspect, the two had different terminal board arrangements and had to be hooked up differently. The hookup that was found caused the bottom head to flash improperly for the DIVERGING APPROACH DIVERGING as well as for the DIVERGING APPROACH DIVERGING aspect where it should have flashed. This condition was then corrected, the signals properly tested and returned to service.

62	5/17/1996	BNSF	CTC			113NN226-16	121 R Track	East Finch, MT	N
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Human Error - Field Wiring Error, Inadequate Service Testing

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.

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.

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

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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64	5/21/1996	BNSF	CTC			Train 1-121-20; 1-1	Color Light Signal	South Elwood, MO	N
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Cause
Narrative
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
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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.

560	6/1/1996	CC	AB			2002	FP	West End Duncombe	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

Number 51's train 2002 reported CLEAR at the west end of Duncombe with no. 50's train at MP 370.

50 reported CLEAR eastbound Lake Ole MP 369 Red cab, then CLEAR at 368.5.

Cause was found to be a storm damaged pole and crossarm (hit by lightning) holding pin 4 H wire into pin 5 H wire at MP 368.

Maintainer cleared line and tested 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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561	6/3/1996	SP	CTC			SP 5HPHLE-03	Signal 6296W	Utah Ry. Jct. Xover, CO	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On June 3, 1996 at approximately 4:55 PM, train no. 5HPHLE-03 traveling east on the eastbound track was approaching a Red signal at ABS 6296E. The Engineer on board reported that he observed signal 6296W, on the westbound track, remain Green well after train 1EUCHQ-31, traveling east on the westbound track, had passed signal 6296W and was heading towards the Utah Railway Junction.

Under the direction of the Signal Supervisor, the signal system was put to STOP and thoroughly tested. Tests showed that when recent repairs were made to replace damaged track connections at ABS 6288, the wires were installed improperly, thus causing the signal malfunction at ABS 6296W.

The track wires in question were installed properly, the signal system was tested and found to be working as intended with no exceptions.

The signal system was returned to service on June 4, 1996 at 12:30 AM.

83	6/8/1996	CSXT	CTC			T64108	Vandalism	Intermediate Signal 3.2, St. Albans, WV	N
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Vandalism - Instrument Case, Cable, or Junction Box Damaged

On June 8, 1996 at approximately 1832 hours, trains T64108 and V61507 traveling westbound at M.P. 2.7 observed eastbound signal at 3.2 displaying an APPROACH with their train on circuit.

Signal system was removed from service.

Signal personnel determined that vandals broke into signal control house and damaged relays causing 32 HDR relay from deenergizing.

Repairs to equipment and operational test performed.

Signal system is now functioning as intended.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
66	6/10/1996	BNSF	CTC			9593W	None	Northport, NE	N	
			Phantom Signal - Due to Unpainted Signal Hood or Background							
			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.							
562	6/14/1996	SP	CTC			SP 1LBDAT12	Signal 2816	Sabinal, Texas	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			On June 14, 1996 at approximately 9:20 AM, Engineer operating train no. 1LBDAT12 traveling east, reported that signal 2816 was Green instead of Flashing Yellow, and the next signal at the west end of Sabinal was Yellow.							
			Under the direction of the Signal Supervisor, the signal system was put to STOP and thoroughly tested. All tests showed the signal system to be working as intended with no exceptions.							
			The signal system was returned to service on June 14, 1996 at 5:00 PM.							
563	6/18/1996	KCS		Automatic		KCS 704	?	Texarkana, AR	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			On 6/18/96 an KCS 704 was traveling north at the KCS/Cotton Belt interlocker at approximately 10:45 hours in Texarkana, AR. The Engineer reported to the Signal Maintainer that the signal at the interlocker was Green and he found a handthrow switch north of the interlocker lined reverse. After investigation by the Signal Supervisor and Signal Maintainer, it was determined that the NWP circuit for the switches north of the interlocker were checking only the yellow aspect and not the green aspect.							
			Immediately the changes were made for the NWP to check the Green aspect. {The signal Supervisor and Maintainer} made all required tests and returned the interlocker to service.							

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
67	6/21/1996	BNSF	CTC			CFWSX 320 Engine	FR-2	W.E. Landes, TX	N	
			Failed Equipment or Device - FR-2							
			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	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			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.							
97	7/8/1996	NS	CTC			8586-8755	Human Error	Beech Fork, WV	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			At approximately 3:50 PM Train No. U34U708 pulled their train about one and one-half units past signal R48 and stopped to cut off their caboose. The crew noticed signal R48 was still displaying DIVERGING APPROACH instead of STOP as it should have with their units occupying the track beyond the signal.							
			Signal personnel were called to investigate and found that the track immediately beyond signal R48 was a shunt fouling that, when shunted, would bring the track voltage on the main track portion down to only 0.2 volts. This was not enough of a shunt to drop out the track relay. Further testing and inspection revealed that when the south rail track connections of the fouling wires were disturbed while the fouling was shunted, the track relay dropped and the R48 signal displayed stop. On close inspection it was found that the bondstrand in both connectors on the south rail had never been crimped. The effects of corrosion over a period of time and vibration resulted in the fouling wires becoming ineffective. No one could remember the last time these particular wires had been reworked/installed. There was documented evidence that shunt fouling tests were performed at this location in accordance with rule 236.104, but apparently the corrosion and vibration had at this point in time caused a high enough resistance to make the wires ineffective for shunting.							
			Two new rail connectors were installed and the track voltage again measured. With a shunt applied in the fouling section, the reading was 0 volts on the main track and the OS track relay dropped with less than one milliampere current. The signal system was returned to service.							

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

564 7/11/1996 AMTK ACS Engine 929 Track Code East of Harrison, NJ N

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

On July 11, 1996, train no. 179, Engine 929, reported just prior to midnight that after passing signal W63 displaying APPROACH (cab signal conformed) and after the normal code change to RESTRICTING, the cab signal changed to APPROACH MEDIUM several times while approaching a STOP signal at "Swift." Testing was performed following this report as explained in our letter of July 26, 1996, attached. On July 27, 1996, three trains, Engines 925, 912 & 923, each reported a similar condition at the same location. Subsequent tests and conclusions are fully explained in our letter of August 8, 1996, attached.

[Text of Letter of August 8, 1996]

Mr. David R. Meyers
 Administrator, FRA
 Scott Plaza Two - Suite 550
 Philadelphia, PA 19113

Dear Mr. Meyers:

On Saturday, July 27, 1996, at 8:09 AM, a report was made to New York Central Control by train 205, engine 925, that cab signals were flipping from RESTRICTING to APPROACH MEDIUM and back to RESTRICTING, while approaching the 3W signal at Swift Interlocking in the STOP position. At 9:18 AM, train 195 with engine 912, reported experiencing the same irregularity in cab signals. Train 204 with engine 923 was instructed to report waysides and cab signals while approaching the 3W signal at Swift Interlocking in the STOP position. He reported all proper, until approaching this signal, where his cab signals started bouncing between APPROACH MEDIUM and RESTRICTING.

This was the second occurrence involving this same scenario in which cab signals went up to APPROACH MEDIUM while the 3W signal at Swift was at STOP. Please find attached, the July 26, 1996 copy of our letter concerning the first incident on July 11, 1996. All tests performed at that time disclosed no irregularities.

C&S personnel arrived on the scene on July 27, while the cab signals were in the failure mode as described by the Engineers of the above-stated trains. Investigation revealed that intermittent removal of steady energy at the W70 signal location from the 2E1 track circuit was caused by the existing circuit design. This produced pulses from W70, eastward, when the code change went into effect on the approach of a train. These pulses were accepted by the locomotive cab signal equipment on the above stated trains in a manner that caused cycling between APPROACH MEDIUM and RESTRICTING cab signals.

C&S management and supervision became involved and determined, by performing a revision of the track circuit design, that these unwanted pulses could be eliminated. This revision was performed on the morning of July 27, 1996.

A re-enactment was scheduled and held in the early morning of August 6, in which the 929 AEM7 locomotive was used to re-create the code failure when the track circuitry was restored to its original design. Amtrak management and C&S employees, along with FRA representatives were on hand. It was proven that the intermittent track circuit pulse produced the cab signal irregularities. Chart recorders were used to get records of what was occurring in this situation. The 929 was downloaded and the tape will be part of this occurrence file. The circuitry was restored to the revision approved network and put back in normal

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

service.

During the re-enactment, the false display of the APPROACH MEDIUM aspect was clearly demonstrated to be only momentary, of approximately one-half second duration, and recurring at a cyclic rate with the display of RESTRICTING for a minimum of two seconds between each one-half second pick-up of the APPROACH MEDIUM. While this condition severely undermined our engineer's confidence in the cab signal system, and is therefore highly undesirable, it did not constitute a dangerous condition such that any engineer would actually accept the momentary false display and try to exceed restricted speed, nor would he have been able to exceed 20 mph, as the speed control continued to limit his speed.

Due to the nature of this condition, there has been some confusion as to whether an actual false proceed report should be filed. However, since the one-half second display was just barely long enough to require an acknowledgment, I am attaching a false proceed report on the prescribed form. Please consider this as a follow-up to our original letter of July 26, 1996, which was filed within fifteen days of the initial occurrence.

If we can be of any assistance concerning any files or records involved with the above, please contact my office at 215-349-1028.

Sincerely,

Assistant Chief Engineer C&S

96	7/11/1996	NS	CTC	7025, CR6028	Resistor	Deal, VA	N
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Failed Equipment or Device - Track Resistor

At approximately 11:00 PM, Train No. 203 passed the southward signal at milepost 187.5 on a CLEAR indication. Looking back they noticed that the northward signal was displaying APPROACH while their train was still occupying the north track circuit. At approximately 11:40 PM, train No. 211 noticed the same problem.

Investigation revealed that the Trakode bleeder resistor, design value of 12.5 ohms, had a resistance of 500 ohms. This high resistance value prevented the resistor from properly acting as a bleeder. With shunt on the 187.6 track, the 187.6 signal would display an approach indication. The high resistance was traced to a film that had developed in the bonds between the carbon and the metal tabs on the ends of the cartridge type resistor. The resistor ends were cleaned, and the resistance dropped to 14 ohms. A shunt on the 187.6 track then was found to cause the proper restricting indication.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
565	7/17/1996	SP	CTC			SP 1HOEGM-16	Signal 34LB	Harlem (West End), Texas	N
			Failed Equipment or Device - Relay						
			On July 17, 1996 at approximately 3:45 AM, Engineer operating train no. 1HOEGM16 traveling west, reported that he went by signal 34LB, at the west end of Harlem, looked back and saw that the signal was Red over Yellow instead of Red over Red.						
			Under the direction of the Signal Supervisor, the signal system was put at STOP and thoroughly tested. It was found that the H-2 mechanism at signal 34LB was sticking in the Yellow position. The H-2 unit was replaced. The signal system was tested and found to be working as intended with no exceptions.						
			The signal system was returned to service on July 17, 1996 at 8:10 AM.						
104	7/17/1996	UP	AB			HOCHT-16	None	Glenwood, Illinois	N
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)						
			On July 17, 1996, at approximately 1840 CDT, on the Chicago Subdivision, the northbound HOCHT-16 accepted an APPROACH aspect at signal 250, Milepost 24.9, on the northward main track and proceeded north stopping short of the northbound UGCCH-17 stopped ahead in the block.						
			An investigation revealed that a tree had fallen through the pole line at Milepost 22.3 wrapping the northward HD wires with the HD wires for the southbound main track and energizing the northward HD wires falsely.						
			The signal system was restored to proper operation, and all applicable tests were performed.						

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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98	7/22/1996	NS	CTC			2822	N/A	Peru, IN	N
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Phantom Signal - Due to Object in Foreground or Background

At approximately 1:57 PM, Train No. 068 was traveling eastbound when each member of the crew called the eastward signal ahead at milepost D-197.3 CLEAR. About one minute later they saw that this signal was Red over Red and were able to stop short of the signal. They reported to the dispatcher that the signal fell in front of them. The dispatcher then lined the signal up for their move, and No. 068 proceeded on signal indication after inspecting their train.

The dispatcher had not lined the signal for No. 068 at the time they reported they had first seen it (verified later with recordings) so he called signal personnel to report a possible false clear. Signal personnel arrived and could not duplicate the incident. All appropriate signal tests were performed with no exceptions taken and the signal itself appeared to have no physical defects. A phantom signal was suspected but could not be checked until the sun conditions were right. The signal was placed back in service with instructions that it not be cleared east until eastbound trains had reported they were stopped at the signal.

The next day at the same time and with the same engine and road foreman engines, an attempt was made to recreate the incident. The engine approached the signal (at STOP) from the west with instructions to the crew to call out the signal indication as soon as they could interpret the aspect. Two crew members called a CLEAR two miles from the signal. The third crew member called a CLEAR 1.5 miles from the signal. The engine was stopped at the 1.5 mile point where all three were in agreement that it was a CLEAR indication. The signal maintainer right at the signal location confirmed that the signal was displaying Red over Red at this time and throughout the test. Signal personnel on the engine agreed that they saw glimmering green light. As the engine was moved toward the signal a red over red aspect was seen by all personnel at about one mile from the signal. The bright green had faded to become a dark green spot above the signal. As the engine neared the signal it was noticed that the green spot was the sun shining on the leafy limbs of a sumac tree located 40 yards behind the signal and about 15 yards off the south rail. Based on this test it was determined that the crew had seen a phantom signal produced by sun reflection off the tree leaves. The tree was cut down and the signal returned to normal service after confirming that the phantom no longer was seen.

85	7/28/1996	CSXT	CTC			Train #	Track Circuit	Vulcan Intermediate, PeeDee, SC	N
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Maintenance - Improper Adjustment, Track Circuit

On 08/02/96 Traincrew reported that on 7-28-96 they received a Yellow over Green indication at M.P. 262.10 and a STOP at the Northend of PeeDee and was routed through the siding. The signal was removed from service. Signal personnel performed operational test and could not duplicate incident. Event log at the Operations Center did not indicate any problem and indicated the train down the main line. Signal personnel along with the local FRA inspector were able to determine that a track circuit failure was occurring in the siding, that problem was corrected. No exceptions were taken to the signal system it has been restored to service.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
84	7/29/1996	CSXT	CTC			Q69629	L-Signal	Richardson Creek, Richardson Creek, SC	N
			Phantom Signal - Due to Sun Angle						
			<p>On July 29, 1996 northbound train Q69629 reported a Red over Yellow signal indication with southbound train F76729 pulling into the siding at Richardson Creek ahead. Signal system was removed from service. Signal personnel along with FRA Inspector performed operation test on the signal and could not recreate this occurrence. It was determined that during the same time of day that sunlight was causing a phantom aspect. A longer hood was installed, lamp voltage adjustments were made. Signal system was placed back in service.</p>						
566	7/31/1996	SP		Automatic		SP 1L374L2-31	Signal 30	Elvas, CA	N
			Scenario Reenacted, Unable to Duplicate, No Defects Found						
			<p>On July 31, 1996 at approximately 4:30 PM, the train crew operating the no. 1L374L2-31 traveling east, reported that signal 30 was Yellow over Yellow when the next signal was Red over Red. The proper aspect for signal 30 should have been Red over Yellow.</p> <p>Under the direction of the Signal Supervisor, the signal system was immediately put to STOP. The signal system was inspected and thoroughly tested and found to be working as intended with no exceptions.</p> <p>The signal system was returned to service on August 1, 1996 at 11:00 AM.</p>						
69	8/4/1996	BNSF	CTC			None	PSO	Essex, MT	N
			Failed Equipment or Device - Insulated Joint(s)						
			<p>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.</p>						

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
105	8/6/1996	UP	CTC		ACS	UP6322	None	Cheyenne, Wyoming	N	
			Maintenance - Improper Adjustment, Track Circuit							
			On August 6, 1996, at approximately 01:10 CDT on the Laramie Subdivision, Eastbound LAAP7D-04 on Track No. 1, while in the block at approximately M.P. 512.50, received an upgrade of his cab signal from Red to Yellow. Eastbound XOACST-03 was ahead of him on Track No. 1 at M.P. 512.25 still occupying the same block with three axles of the last car.							
			An investigation revealed the high level output from the cab transmitter at M.P. 512.25 enabled the cab signal to push by the three axles and upgrade the cab signal on LAAP7D-04.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
86	8/9/1996	CSXT	APB			Train 361	Semaphore	Salty Block Signal, Rushville, IN	N	
			Failed Equipment or Device - Semaphore Signal							
			On August 9, 1996 Train 361 reported a CLEAR signal at signal E67-31, this signal should have been Red. Signal system was removed from service. Signal personnel investigated the incident and determined that the ratchet pawl was engaged with no battery applied. Ratchet pawl assembly was replaced.							
567	8/10/1996	SEPA	CTC	Remote			Home Signal L12D	CP Kalb, Borough of Norristown, Montgomer	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			Nature of Failure: Engineer reported passing home signal L12D at CP Kalb (approach signal to home signal 2S at CP Ford) displaying APPROACH MEDIUM instead of MEDIUM APPROACH with home signal 2S at CP Ford displaying RESTRICTED.							
			Cause of Failure: Cause was traced to a circuit design condition. Circuit for signal L12D (searchlight-type) should not have been poled when a RESTRICTED signal was displayed for signal 2S at CP Ford.							
			Corrective Action Taken: Set signal L12D at CP Kalb to RESTRICTED. Corrected circuit design. Conducted necessary tests and inspections. Returned system to normal operation.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
87	8/12/1996	CSXT	CTC			Train D773	Insulation	Conboy, PA	N
			Failed Equipment or Device - Interior Wiring						
			<p>Train D773 traveling west on #1 track reported a Red over Green aspect and that a Green aspect was displayed on #2 track. Signals were removed from service. Signal department personnel investigated the incident and determined that the LCHR relay control wires were environmentally damaged causing a short which allowed current to flow improperly to the relay coil.</p> <p>Signal personnel replace the wires and performed all operational test. Signal system functioned as intended and were placed back in service.</p>						
568	8/19/1996	SP	AB			SP 1MNGVC-17	Signal 8461	Ordway, CO	N
			Scenario Reenacted, Unable to Duplicate, No Defects Found						
			<p>On August 19, 1996 at approximately 10:40 PM, Engineer operating train no. 1MNGVC-17 traveling west, reported that signal 8461 at the east end of Ordway was Green. Signal 8461 should have been Red because the switch at the west end of Ordway was reversed.</p> <p>Under the direction of the Signal Supervisor, the signal system was thoroughly tested. It was found that the Red lamp in signal 8461 had burned out therefore it was dark when it should have been Red. Other than the burned out Red bulb in Signal 8461, all tests showed the signal system to be working as intended with no exceptions.</p> <p>The signal system was returned to service on August 20, 1996 at 7:00 AM.</p>						
88	8/23/1996	CSXT	APB				Lamp Unit	Signal 1711, Salem, IN	N
			Failed Equipment or Device - Semaphore Signal						
			<p>On August 9, 1996 Soo Line Train Crew reported a more favorable aspect than desired at signal 1711. Signal system was removed from service. Signal personnel investigated the incident and determined that lamp unit had deteriorated and was obstructing the semaphore arm. The lamp unit was replaced and operational test performed. The signals were placed back in service.</p>						

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
73	8/24/1996	BNSF	CTC			None Involved	PSO Receiver	Signal MP 48.6 near Silvana, WA	N	
			Human Error - Improper Frequency Selection for Replaced Component							
			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.							
106	8/28/1996	UP	CTC	Automatic	ATC	CNW6905	None	Rochelle, Illinois	N	
			On August 28, 1996, at approximately 0145 CDT on the Geneva Subdivision, westbound ELNP-27 was proceeding west on No. 2 Track at restricted speed east of M.P. 74.0 with a Restricting cab signal aspect. The cab signal aspect was Restricting as the home signal at the BN interlocking at M.P. 75.3 was displaying a Stop aspect. At approximately M.P. 74.0, the cab signal changed to a Clear aspect and remained Clear until changing back to a Restricting aspect at approximately M.P. 74.25.							
			An investigation revealed a high level of 120 Hz energy on the track originating from a track rectifier at the battery end of a DC track circuit which operated in combination with the feed transformer for the 100 Hz ATC.							
			The wiring for the track rectifier, battery, and ATC feed transformer was revised to a standard arrangement which minimizes the 120 Hz energy on the track circuit. The signal system was restored to proper operation, and all applicable tests were performed.							
586	8/29/1996	CR	CTC			Eng 8206	Auto. Sig. 1291	Smithville, OH	N	
			Failed Equipment or Device - Relay							
			Engineer on westbound train WIMA-3 reported signal 1291 West Dark and signal 1292 East CLEAR with the rear of his train in the block. Cause was determined to be a defective B2ETR track relay which remained in the energized position with a .06 ohm shunt applied to the track circuit and 18mA of current on the coils. Relay was replaced, all appropriate tests were performed, and the signal system was returned to service. Failed relay is being sent to the manufacturer for further analysis.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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569	9/1/1996	SP	CTC			SP 1WCEUQ31	Signal 32LA	Bealville, CA	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

On September 1, 1996 at approximately 1:35 PM, Engineer operating train no. 1WCEUQ31 traveling west, reported that signal 32LA, at the East End of Bealville, was Green; the next signal, the 26LA, at the Bealville Crossover, was Red. Signal 32LA should have been Yellow.

Under the direction of the Signal Supervisor, the signal system was thoroughly tested. All tests showed the signal system to be working as intended with no exceptions.

The signal system was returned to service on September 1, 1996 at 6:00 PM.

70	9/3/1996	BNSF	CTC			Q-CVL11-02 Eng. 8	EC-4, 213A Module	Avard, OK	N
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Failed Equipment or Device - Electrocode Module

At approximately 0720 hours on 9-3-96, train Q-CVL11-02, 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.

71	9/12/1996	BNSF	AB	Remote		UP 01XSEAP	Shunt Wires	Vancouver, WA	N
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Maintenance - Switch Shunt Wires Broken

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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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570	9/13/1996	CR				Train STPI, Eng. #3	Cab Signal	Columbiana, OH	N
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Human Error - Improper Equipment Installed

Cab signal on STPI upgraded from RESTRICTING to APPROACH MEDIUM with home signal ahead at STOP. Cause was non-insulated lose on rail greaser located between Tracks 1 and 2 coupling rails together and allowing cab signal from Track 2 to couple to Track 1. Hose was replaced with an insulated hose and a nylon coupler was installed.

99	9/13/1996	NS	CTC			1639	Signal	Clemer, IN	N
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Phantom Signal - Due to Unpainted Signal Hood or Background

Train No. 144 was traveling westbound and had been informed that they were to meet eastbound Train No. 206 at Clemer. At approximately 8:07 AM Train No. 144 called westward signal B-417.9 APPROACH DIVERGING. Approximately two minutes later Train No. 144 called an APPROACH for the westward signal at East End Clemer, which was the correct signal since they were lined to take and hold the main track. Train No. 144 should have seen an APPROACH at B-417.9 with a westward APPROACH displayed at the East End Clemer. A route had been lined for Train No. 206 to take the siding so the B-423.5 signal was correctly displaying APPROACH DIVERGING. TC logs at Ft. Wayne verified these routes were set up for the meet.

Signal personnel were called to investigate and were unable to duplicate the incident as reported. All appropriate tests and inspections were made with no exceptions taken. Numerous attempts to duplicate the problem were made with nothing out of the ordinary seen. The B-417.9 colorlight signal has a three-position head on top and a single Green head that is lit only for the Yellow-over-Green APPROACH DIVERGING indication. The bottom head was observed to be dark as intended unless a route was lined westward into the Clemer siding. A phantom aspect was then suspected but would have to be checked under the sunlight conditions encountered by Train No. 144.

The next morning, right after 8:00 AM, the same crew and engine were used to check for a phantom aspect. During the recreation, two separate occurrences of a phantom signal were observed. At MP 417.2 a faint Green could be seen that was found to be caused by reflection off the aluminum colored mast between the two signal heads. At MP B-417.7 the signal looked proper - Yellow over Dark. About 200 feet from the B-417.9 signal sunlight was seen to be reflecting through the bottom Green lens. The problems were corrected by painting the part of the mast between the heads flat black and by using an extended hood on the bottom head.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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89	9/17/1996	CSXT	APB			N/A	Pole Line Control Wires	Signal 2655, Salem, IN	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

On September 17, 1996 a credible report was made that northbound signal at M.P. 265.5 was displaying a CLEAR as a southbound train was approaching a CLEAR southbound signal.

Signal system was removed from service.

Signal personnel performed operational test and determined that a tree had fallen into the pole line at M.P. 259.0 causing the control wires for signal 2655 to become wrapped with a crossing signal start circuit.

Repairs were made, signal system functioned as intended.

Signal system was returned to service.

90	9/18/1996	CSXT	APB			Train PO5017	Semaphore	Indianapolis Subdivision, IN	N
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Failed Equipment or Device - Semaphore Signal

On September 18, 1996 Train PO5017 reported that when approaching and passing a CLEAR eastbound signal at MP 102.5 that the Westbound signal at the same location was in the CLEAR position.

Signal system was removed from service. Signal personnel performed operational test and determined that semaphore blade was stuck in the clear position with hold clear mechanism and track relays deenergized.

Repairs to semaphore signal were made and signals performed as intended.

Signal system was returned to service.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
100	9/20/1996	NS	CTC			8880	Human Error	Silvercreek, NY	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			At approximately 1:50 AM westbound train No. 548L119 called signal B-25.1 CLEAR. The engineer immediately notified the dispatcher on the radio that he believed he should have received an APPROACH aspect at the subject signal because he did not believe that the train No. 303 ahead had yet cleared the control point at Silver Creek, MP B-32.3. The control point at Silver Creek and the B-25.1 intermediate signal are separated by an intermediate signal at MP B-30.1.							
			Signal personnel were called to investigate and found two HD control circuit wires improperly rolled in a cut section case at MP B-26.7. It was verified that with these two wires rolled, signal B-25.1 would display a CLEAR instead of an APPROACH with the block between Silver Creek and B-30.1 occupied.							
			From the investigation, it was obvious that the rolling of the wires had been inadvertently done by C&S employees working at the location. Overtime and train delay records indicate that several signal failures had occurred in the area in the two days immediately preceding the subject incident. Interviewing of employees involved in these trouble calls and all other C&S employees who work on this district has thus far been unsuccessful in identifying the employee who left this defect in the system.							
			The wires were restored to their proper terminals, proper signal system checks made, and the system restored to normal operation.							
72	9/26/1996	BNSF	CTC			Westbound BN Trai	Intermediate Signal 244.6 (A Head)	Springfield, MO	N	
			Failed Equipment or Device - Interior Wiring							
			Westbound train 91817-26 looked back and observed eastbound signal 244.6 Yellow over Red as they were passing. Train crew stopped train and advised Dispatcher. Dispatcher held 91817-26 until Maintainer, Inspectors, General Construction Supervisor, and Trainmaster arrived at location. With all Signal personnel present the Yellow over Red aspect was verified with train 91817-26 setting on main track with cars setting east and west of signal. Upon investigation it was found the control circuit for the A head H2 mechanism had foreign battery on it holding the top signal Yellow. A ground and cross test was performed on the wires going to the H2 and revealed crossed wires but no current flow to ground. The source of foreign battery was found to be coming from the negative light battery (-B) and positive battery from the +B circuit for the mechanism. Further inspection revealed all wires from the case to the mechanism were bare (insulation wore off) where the wires were routed from the mast into the flexible conduit going to the H2 unit. Wires were replaced to the A and B signal mechanisms and tests performed. Signal OK for normal use at 7:06 PM.							
571	9/27/1996	CR				TV55, Eng. 6117	Automatic Signal 779-2	Galion, OH	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			Engineer on TV55 westbound on #1 track observed signal 779-2 on #2 track at APPROACH MEDIUM with home signal at CP-80 at Stop.							
			Found that polar control relay 779BDR had been redesigned as a neutral relay by design contractor. Circuit was redesigned with separate BDR circuits and installed correctly.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
74	10/2/1996	BNSF	CTC			1260	Insulated Joints and Lightning Arrestors	Hinsdale, IL	N	
			Failed Equipment or Device - Insulated Joint(s)							
			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.							
572	10/21/1996	AMTK	CTC			Control Car #1519	180 Decoding Unit	Dorchester Branch, Boston, MA	N	
			Failed Equipment or Device - Cab Signals							
			On Monday, October 21, 1996 at 1:15 p.m., the engineer of MBTA Commuter Train #042 reported holding a CLEAR cab signal after passing signal 225.8 2E displaying an APPROACH aspect (Yellow over Red) while operating #2 track eastbound on the Dorchester Branch. Train #042 had cab car #1519 on the lead with four coaches and engine #1053 pushing the consist. The Dorchester Branch is reverse traffic signaling with 100 Hz Phase Selective circuits.							
			Amtrak C&S management was notified and dispatched to the scene with signal maintainers and test personnel. Tests revealed during the investigation that the 180 decoding unit located at cut section 226.8 (which is also signal location 226.8 2W for westbounds) was permitting the 75 code feeding westward to that location to create an output sufficient enough to energize the DR relay. This would then allow 180 code to be applied to the rails improperly and feed westward to generate CLEAR cab signals.							
			Correction was made by replacing the 180 decoding unit and all operational tests performed afterwards showed all circuits functioning as intended.							
91	10/25/1996	CSXT	CTC			Train R67410	Lighting Circuit	South Halls, Halls, GA	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			On 10/11/96 Train R67410 reported receiving a MEDIUM APPROACH signal on #2 signal and that #6 signal out of siding was displaying a MEDIUM APPROACH.							
			Signals were removed from service.							
			Signal personnel investigated the incident and determined that a break in the LBHG circuit through the LAHR relay had not been installed.							
			Corrections were made, operational test performed and signals functioned as intended.							
			Signal system was restored to 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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574	11/1/1996	AMTK		Manual			52R Signal	21st St. Int., Chicago, IL	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On Friday, November 1, 1996, Amtrak's Signal Engineer received a report at approximately 7:30 a.m. that train crews were observing the 52R signal, at 21st Street Interlocking in the Chicago Terminal area, display a SLOW CLEAR aspect when the 4R signal at CP Cermak belonging to the Illinois Central system was lit at STOP. Under normal conditions the 52R will display a SLOW APPROACH to the 4R in the STOP position.

Investigation of this report by Amtrak's Signal Engineer revealed that 15 VDC energy was being incorrectly fed from CP Cermak to the 52R control circuit at 21st Street Interlocking when the 4R signal was in the STOP position. The 52R control circuit was immediately opened so as not to allow unwanted foreign energy into the circuit.

Amtrak and Illinois Central signal management met and found that at the signal bungalow for CP Cermak, incorrect wiring had occurred by Illinois Central personnel after that location had been tested due to a recent signal cutover.

Although the false clear aspect was on Amtrak's 52R signal at 21st Street Interlocking the cause for that failure was due to improper wiring of the Illinois Central signal network.

573	11/1/1996	SEPA		Remote			20LBDPR Circuit	Signal 20L, Newtown Jct. Int., MP 6.2 Main Li	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

Nature of Failure: Conrail engineer of southbound freight train SCCS-1 reported southbound home signal 20L displayed MEDIUM CLEAR and approached next signal, signal 4W-2 at CP Nice displaying STOP.

Cause of Failure: Design problem. Signal 20L should have displayed a MEDIUM APPROACH indication for a route through the interlocking to the Conrail low grade route for this move. The least restrictive indication to be displayed at signal 20L for this route is APPROACH MEDIUM.

The MEDIUM CLEAR indication that was displayed at signal 20L was the result of the 20L BDPR circuit being energized through an alternate energy source that had existed from a former circuit configuration. The circuit energy should have been fed only through #17 switch reverse indication a crossover route, to southbound on the Main Line.

A simultaneous southbound parallel move from home signal 16L for a SEPTA train caused the 20L BDPR relay to energize from the alternate energy source.

Correction: Revised circuit by removing the alternate energy source.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
575	11/4/1996	SP	AB			SP 1EYSCH-02	Signal 5706	Olmitz, CO	N	
			Phantom Signal - Due to Sun Angle							
			On November 4, 1996 at approximately 4:00 PM, Engineer operating train no. 1EYSCH-02 traveling east, reported that signal 5706 was Green and signal 5692 at the west end of Olmitz was Red.							
			The Signal Supervisor was called and arrived at the location within 15 minutes. He watched signal 5706 and observed that the sun was shining onto the signal head in such a way that the Yellow aspect could not be seen, while the Green aspect appeared lit. Phantom screens were installed on the signal head, and the batteries were replaced to increase the voltage on the signal lamp.							
			The signal system was thoroughly tested; all tests showed the signal system to be working as intended with no exceptions.							
			The signal system was returned to service on November 4, 1996 at 7:00 PM.							
92	11/6/1996	CSXT	CTC			East Bound Train	Grounded Cable	E. Garrett, Garrett, IN	N	
			Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)							
			On November 6, 1996 at East Garrett, Indiana, an Eastbound Train Crew reported the dwarf signal on adjacent track was displaying a STOP AND PROCEED signal.							
			Signal system was removed from service.							
			Repairs were made, operational test performed and signals placed back in service.							
93	11/13/1996	CSXT	CTC				Relay	Grand Junction, Jacksonville, FL	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			On October 28, 1996, Train Crew reported receiving a MEDIUM APPROACH signal at Grand Junction for movement from Mildale Lead to #2 track, as they approached the switch it was lined for a normal move from #2 to #2.							
			The signal system was removed from service. Signal department personnel and FRA Inspector investigated the incident. It was determined that a modification was made to the system and a test was inadvertently missed. Corrections were made, operational tests performed and the signals functioned as intended.							
			Signal system was placed back in service.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
75	11/16/1996	BNSF	CTC			Suburban 1268	Lightning Arrestors	Westmont, IL	N	
			Failed Equipment or Device - Lightning Arrestors, Shorted							
			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.							
76	11/22/1996	BNSF	CTC			None	SB ABS Sig B Yard Switch	Vancouver, WA	N	
			Insufficient Information in Report to Assign Cause							
			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.							
577	11/30/1996	CC		ATS			FP-CL	East Absolute C.L. Signal, Mills Siding MP 323	N	
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)							
			False proceed signal; absolute signal east end Mills Siding.							
			On 11/30/96 at 1:40:00 eastbound train UUPWF04 holding main line west of the siding switch Mills observed Green aspect on eastbound absolute signal with westbound train WFLD29 in the block between Macy and Mills siding. The Green aspect was observed two different times at 15 sec. each time then returning to Red aspect.							
			Signal department upon arrival recreated the false proceed indication. Further tests produced cause of false proceed as follows: Wood pin holding common line wire on pin 6 of pole line at MP 323.6 was broke and touching pin 9 550 volt supply line. This caused 3232 H relay to burn up fusing contacts causing 3238H to be energized.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
576	11/30/1996	SP	CTC			SP 1MNGVC-30	Signal 30	Ridgley, IL	N
			Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)						
			On November 30, 1996 at approximately 2:30 AM, Engineer operating train no. 1MNGVC-30 traveling west, reported that signal 30 cleared Yellow while the C.I.M. train was flagging across the Interlocking.						
			The Signal Supervisor was notified and he had the Dispatcher hold all trains in their position until he arrived. Upon arrival at the Interlocking, he confirmed that the 30 signal was Yellow. The cable was meggered and was found to be bad. The cable was replaced from the tower to the westbound home signals and the signal system was thoroughly tested. All tests showed the system to be working as intended with no exceptions.						
			The signal system was returned to service on November 30, 1996 at 7:00PM.						
77	12/2/1996	BNSF		Remote			Searchlight Signal 808EE	University Ave., Minneapolis, MN	N
			Human Error - Field Wiring Error, Inadequate Service Testing						
			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
			Failed Equipment or Device - Relay						
			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.						

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
79	12/16/1996	BNSF	CTC			SLBCH3-12 Engine	Underground Cable	La Lande, NM	N
			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 Signalman and Foreman involved, additional test equipment will be provided to this signal gang, discipline was assessed to Signalman involved requiring retraining before returning to work.						
107	12/20/1996	UP	AB			UP5041/NLSH-20	None	Marshall, Texas	N
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing						
			On December 20, 1996, at 16:00 CDT on the Reisor Subdivision, southbound NLSH-20 reported the southbound signal at the north end of Louisiana, M.P. 350.3 was CLEAR and the Spring Switch at the south end of Louisiana was lined reverse.						
			An investigation revealed the NWP relay for the Spring Switch did not break the HD signal control circuit to cause the southbound signal to display a Red signal.						
			The circuits were revised to break the southbound signal's HD wires with the NWP relay.						
			The signal system was restored to proper operation, and all applicable tests were performed.						
578	12/30/1996	CR	AB			UP2455	Signal 2E @ CP-154	St. Elmo, IL	N
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing						
			Engineer on eastbound NLINO observed a CLEAR signal on 2E with signal 152E STOP AND PROCEED ahead. Investigation revealed that the switch repeater 1520NWPR did not open the 2EHR relay, which allowed a CLEAR code to be generated from the micro unit at signal 152E. Circuit was reissued with 2EHPR relay contact located in input circuit of Microcode unit. Failure was due to unauthorized field change. Plans reissued as originally designed.						
			Signals tested and returned to 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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151	1/2/1997	UP	CTC	Manual		Job #700	Underground Cable	Avondale, LA	N
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Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)

On January 2, 1997, at 14:25 CDT on the Alexandria Subdivision the Tower Operator at West Bridge Junction, at Milepole 10.2 reported that as Train Job #700 passed Signal No. 7 leaving the new yard on the SP tracks to Westwego, Signal No. 7 stayed Yellow.

An investigation revealed the 7GZ signal mechanism had a ground on it through an underground cable from switch No. 9 which kept the mechanism energized with a train occupying the OS track ahead of Signal No. 7.

The underground cable was replaced, and the signal system was restored to proper operation, and all applicable tests were performed.

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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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142	1/13/1997	NS	CTC			N/A	Insulation	Front Royal, VA	N
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Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)

At approximately 7:30 AM Asst. Track Supervisor was driving southbound on a road adjacent to the track when he noticed southward intermediate signal 63.9 displaying a CLEAR aspect. Being aware of the fact that northbound train 460V612 was in the block ahead around milepost H-68, he knew the signal should have been displaying RESTRICTING so he reported the incident to the dispatcher.

Signal personnel were called to investigate, and, upon arrival were able to duplicate the reported incident. Both the 63.9 and the 66.7 signals would display a CLEAR aspect when the next southward signal ahead was RESTRICTING and was not sending energy on the 667 BP line circuit. The problem was traced to a falsely energized 667 BP relay.

Signals in this area are AC operated. The false energy was found to be caused by two grounds south of milepost H66.7. BX110 was found to be going to ground through the insulation holding a contact in the slide fence circuit controller at milepost H67.8. The grounded BX110 was getting to the 667 BP line wire from a guy wire that was touching it at milepost H 67.4. The guy wire had been damaged at some previous time, allowing it to come in contact with the 667 BP line wire. Both grounds were eliminated, the signals tested and then put back in service.

108	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."

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
152	1/23/1997	UP	CTC			UP 3697	None	Mason City, Iowa	N
<p>Cause</p> <p>Narrative</p> <p>Human Error - Field Wiring Error, Inadequate Service Testing</p> <p>On January 23, 1997, at approximately 1:50 CDT on the Mason City Subdivision KSIT/22 was northbound at M.P. 199.69 and had the distant signal Green with a route to the siding at U199. The distant signal should have displayed a Yellow signal.</p> <p>An investigation revealed the Electrocode program at U199 needs to be changed to code a Yellow to the distant signal with the route lined for the siding.</p> <p>The green bulb has been removed from the distant signal until the new software is installed. All applicable tests were performed.</p>									
130	1/24/1997	CSXT	AB			Train Z49022	Intermediate Signal	Intermediate Signal 259.2, Mitchell, IN	N
<p>Maintenance - Wiring Chewed by Rodents</p> <p>On January 23, 1997 Soo Line Train Z49022 reported a CLEAR signal at intermediate 259-2 with CSX train Q564-22 ahead.</p> <p>Signal system was removed from service. Investigation revealed that the signal control wires for this signal had been damaged by rodents. Voltage present on one of these wires was demonstrated to recreate this problem.</p> <p>Train Control personnel made repairs to the signal control wires, conducted operational test and returned the signal system to service.</p>									
579	1/28/1997	WC	AB				Signal 105.9	Sussex, WI	N
<p>Human Error - Field Wiring Error, Inadequate Service Testing</p> <p>SA mechanism had improper polarity giving CLEAR indication verses APPROACH.</p> <p>Mechanism changed out 1/27/97 rail gang working west of signal so circuit could not be tested.</p> <p>Testman did not return to make final check after track was put back together.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking Systems	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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131	1/29/1997	CSXT	AB			Train J770	Semaphore Mechanism	Intermediate 147.7, Crawfordsville, IN	N
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Failed Equipment or Device - Semaphore Signal

On January 29, 1997 northbound train J770 reported their northbound signal was CLEAR and observed the opposing southbound signal at APPROACH.

The signal system was removed from service. Investigation revealed condensation had formed inside the semaphore mechanism housing. Due to extremely cold temperatures the brushes of the semaphore mechanism froze to the armature, preventing the mechanism from displaying the proper aspect.

The condensation was removed from the motor brushes and armature assembly. The seals of the semaphore housing were replaced with new seals and the armature and brushes were cleaned with contact cleaner. An operational test was satisfactorily completed and the signal system was returned to service.

580	1/29/1997	SEPA	AB				Signal #302	ABS #302, MP 11.1, Main Line, Montgomery	N
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Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)

Nature of Failure: Engineer of southbound train 0121 reported passing signal #302 displaying CLEAR with next signal, #R2 at CP-Jenkin displaying STOP.

Cause of Failure: Could not duplicate condition, however, during investigation and testing it was found that circuit NR2DRP contained a conductor with less than 100,000 ohms resistance to ground although the circuit was working as intended.

A grounded conductor in this circuit could cause the condition.

Corrective Action Taken: Relocated NR2DRP circuit to a conductor with acceptable resistance to ground reading. No other condition was found that would have contributed to the incident. Performed all necessary tests and inspections to determine if the condition existed.

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

153	2/8/1997	UP	AB			UP9191	Relay, 75 Coder	North Platte, Nebraska	N
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Failed Equipment or Device - Relay

On February 8, 1997, at 14:40 CDT on the Council Bluffs Subdivision, CJRWB-07 was eastbound on Track No. 2 at M.P. 285.5 and observed the eastbound signal at B285 was cycling from Green to Yellow with the second track ahead of the signal occupied.

An investigation revealed a Style 75 Coder Relay that operated the eastbound signal at B285 intermittently failing.

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

NOTE: This report supercedes previous report of this incident dated February 14, 1997.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
581	2/20/1997	KCS	CTC			UP3589	N/A	Mauriceville, TX	N
<p>Cause</p> <p>Narrative</p> <p>Human Error - Field Wiring Error, Inadequate Service Testing</p> <p>At 11:30hrs on 2/20/97 Extra UP3589 North the AGLI with Engineer and Conductor was traveling north on the main line at Mile Post 752.88 and received a CLEAR signal at signal #7522 the north bound approach to South Mauriceville. Upon arriving at South Mauriceville Mile Post 750.1 they received a Red over Lunar signal which is a normal head in move into the siding. Signal Maintainer [redacted] and Signalman [redacted] performed all applicable tests and found and corrected the problem. Signal Supervisor [redacted] was en route and verified testing and results with [redacted].</p> <p>On 2/19/97 [redacted] and [redacted] combined a split battery system (LB10 & RB10) at control point South Mauriceville, TX. During a previous wiring change an old circuit had been left in, which referenced B10 to the Code 4 output (Green output) on the south Electrocode IIC unit. This caused the approach signal (7522) to display a Green aspect. Proper testing was not performed after disarrangement of LB10 and RB10. A formal investigation is scheduled concerning this matter.</p> <p>Attached are the statements of findings from [redacted] and [redacted].</p>									
111	2/24/1997	BNSF	AB			SP 8027 Eng, ICXCI	Signal 1617	Crowley, LA	N
<p>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</p> <p>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.</p>									
582	2/27/1997	CR		Remote		6749	Home Sig. 4E @ CP Tara	Rutherford, PA	N
<p>Maintenance - Wiring Chewed by Rodents</p> <p>4E signal at CP Tara observed at Advance Approach with automatic signal 1022E ahead at STOP AND PROCEED. Cause was the 432 HGP relay being falsely energized at signal 1022E. False energy on the 432HGP circuit was caused by rodents chewing through the insulation of the conductors which control the signal mechanism. All damaged conductors were replaced, all appropriate tests were completed and the signal system was returned to service.</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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154	3/21/1997	UP	CTC			UP9453	None	Kansas City, Missouri	N
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Vandalism - Instrument Case, Cable, or Junction Box Damaged

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

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

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

143	3/22/1997	NS	CTC			8610, 7026	Wiring Error	Harriman, TN	N
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Human Error - Field Wiring Error, Inadequate Service Testing

At approximately 3:00 PM, Train No. 235 was running northbound approaching Harriman. The signal at milepost 47.1D, the approach to Harriman, was displaying a CLEAR aspect. Knowing the location of Train No. 196 ahead, the crew correctly assumed that their next signal (Signal 24-2N at Harriman, milepost 49.6D) would be displaying STOP and that they would have seen an APPROACH at 47.1D. Train No. 235 had no trouble complying with subsequent signal indications and reported the incident to the dispatcher. A following train, No. 302, reported a similar occurrence at about 3:30 PM.

Signal personnel were called to investigate and were able to duplicate the reported incident. The problem was traced to a wiring error in the code out selection circuit for the Electrocode box connected to the south track at Harriman. The error allowed a "D" code (code 4) to be sent to 47.1D when a "H" code (code 2) should have gone out. The problem was corrected, the system was checked and the signals were returned to service.

The wiring error was apparently made during a cut-in of a new code system the day before the incident. The modified prints called for the #5 contact group in the 24-2NAG relay to be used for an indication circuit. During cut-in, it was discovered that the Electrocode code selection circuit already used this group, and somehow as the conflict was corrected, the front contact selection wire got doubled in with the heel wire.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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144	3/22/1997	NS	CTC			8516-8558	Wiring Error	Poe, VA	N
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Human Error - Field Wiring Error, Inadequate Service Testing

At approximately 12:10 AM, Train No. 184 eastbound received a CLEAR indication on #2 signal at Poe off the Beltline for movement onto Main No. 1. At the time, Train No. 676 was working the Car Lot track, having entered through the west end crossover off of Main No. 1. Though No. 676 was clear of the fouling circuit, both the mainline and inside hand throw switches were still in the reverse position, and since this was in the block immediately east of Poe, the #2 signal should not have cleared. The dispatcher had requested the route for Train No. 184 when the block light went off on Main No. 1 east of Poe, thinking that No. 676 had cleared up in the Car Lot track and restored his switches. The #2 signal went in time once No. 676's crew started to restore the switches. Train No. 184 did not move on the #2 CLEAR signal indication since they were aware of the reversed switches. The alertness of the involved train crews prevented an accident in this case.

Signal personnel were called to investigate and were able to duplicate the incident. They found that neither the mainline nor the inside switch were wired according to the print. The way they were wired caused the normal switch repeater relay for this crossover to be energized not only when both switches were normal, but also when both were lined reverse (for movement main to Car Lot track). When either switch was out of correspondence with the other, the relay dropped. This is why the condition was not detected during 236.103 tests.

The wiring errors were corrected, the signal system tested appropriately, and signals were returned to service. It is not known when or how this wiring error came about. Due to the "normal" nature of train operations involving this switch, it could have gone undetected for a long time.

145	3/24/1997	NS	CTC			8805-8893	Phantom Signal	Williamson	N
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Phantom Signal - Due to Unpainted Signal Hood or Background

At approximately 12:00 noon, Train No. U06-581, running eastbound, called an ADVANCE APPROACH indication on signal N-471.2 shortly after emerging from Williamson Tunnel. The crew, consisting of Engineer and Conductor and accompanied by Trainmaster, all reported seeing this indication, but as they got nearer to the signal, they reported it "dropped" to an APPROACH. Facts later were used to determine that an APPROACH was the proper signal they should have received on N-471.2 as the next signal at Williamson had never been lined for their route.

Signal personnel were called to investigate and could not duplicate the reported incident. Appropriate signal tests were made at both Williamson and at signal N-471.2 with no exceptions taken. The signal system was returned to service with appropriate limitations until a test for a phantom aspect could be made.

At about the same time the next day, a reenactment was made with a similar lead locomotive configuration. Trainmaster accompanied the signal personnel. With his help, it was determined that the ADVANCE APPROACH had first been noted in a 6-degree curve leading to the signal at a point approximately 1270 feet from the signal. The APPROACH indication had been noticed at about 950 feet from the signal. Whereas there was bright sunlight on the day of the accident, this next day it was overcast. It was observed that the signal indication could not be seen until they got to about 950 feet from the signal. Trainmaster then acknowledged that what he had observed further out than 950 feet on the previous day could not have been the lighted aspects because of the signal alignment. At about 12:15 PM the sun did come out bright and a possible phantom ADVANCE APPROACH was observed from the sun reflecting off the tops of the signal hoods. The signal hoods are slightly faded with a lot of bird droppings on them. This was a very dim looking phantom, and should not have been construed as being a signal.

Report #	Date	Reporting Carrier	Block System	Interlocking Systems	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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132	3/30/1997	CSXT	CTC					North Tucker, Tucker, GA	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On Saturday March 30, 1997 at 1:38 P.M. northbound train Q51428 reported Northward Absolute Signal at North Tucker displaying a CLEAR indication while a southward train was just south of the Gloster Holdout signal.

The signal system was removed from service immediately. Signal personnel were able to recreate the situation and investigation revealed that a small machine screw was bridging the LCH relay's 1 and 2 heel contacts thus causing the LA signal at North Tucker to display a CLEAR aspect.

The screw was removed, operational tests completed, and proved the signal system to operate properly. Signals were returned to service.

Further investigation revealed that approximately 1 year earlier the installation of radio control equipment and the removal of Union Switch and Signal 506 system was the origin of the machine screw. The old code equipment was residing directly above the LCH relay and is believed to be the culprit of the machine screw and was inadvertently missed during clean up.

An alert bulletin has been issued to all field personnel to promptly inspect for similar conditions as well as emphasizes the importance of prompt and proper cleanup subsequent to wiring work.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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112	4/4/1997	BNSF	CTC			C-TPRR1-04	Engine None	Augusta, Kansas	N
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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.

583	4/6/1997	CR		Remote		1681	Home Signal 8E	Wayne, Michigan	N
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Phantom Signal - Due to Sun Angle

Home signal 8E at Wayne Jct. Interlocking was passed in Red position by Engine 1681. Engineer and Conductor both stated that signal appeared to be displaying RESTRICTING. Investigation revealed that sunlight reflecting off of signal lens caused a Yellow aspect. Signal did have proper hood and lens configuration. Signal mechanism and lens were replaced with no noticeable improvement. Phankill was installed which improved situation. A different style of lens assembly was also installed. Signal was returned to service.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
155	4/7/1997	UP	AB			LVW50-06	Switch Foot	Adobe Creek, Colorado	N	
			Maintenance - Switch Circuit Controller							
			<p>On April 7, 1997, at 2:22 DST on the Hoisington Subdivision, eastbound LVW50-06 observed the signal at the west end of Adobe Creek was CLEAR with the switch at the east end of Adobe Creek in a reverse position for movement from main to siding.</p> <p>An investigation revealed the switch foot connecting the switch rod to the switch point at the east end of Adobe Creek was broken, so reversing the switch would not operate the switch circuit controller which would have caused a Red signal at the west end of Adobe Creek.</p> <p>The switch was repaired; the signal system was restored to proper operation, and all applicable tests were performed.</p>							
114	4/15/1997	BNSF	CTC			UP-		North Portland Jct., Oregon	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			<p>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.</p> <p>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.</p> <p>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.</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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146	5/3/1997	NS	CTC			7129	Relay	Powder Springs, GA	N
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Failed Equipment or Device - Relay

At approximately 7:35 AM, Train No. 150G102 with Engineer, Engineer Trainee, and Conductor, was northbound north of Powder Springs when they called a CLEAR indication (G/R) at intermediate signal 128.2 and then had a STOP indication at the next location, Clark control point. Train No. 688 was occupying the block north of Clark. Train No. 150 was brought to a stop before passing the STOP signal at Clark.

The incident was reported, and signal personnel were called to investigate. They were able to recreate the problem and traced it to an intermittently sticking 180D relay. The signals are controlled by a GRS Ratecode system. Yellow code rate, which was seen being received during recreation, is 75 per minute. The 180D relay is supposed to be picked only by a 180 per minute code rate as selected through a 180 decoder. With the 180D relay stuck up, signal 128.2 would display a Green over Red instead of a Yellow over Red while a 75 rate was received. If no rate received, the signal would display stop since the H relay needs to be up in order to get any signal.

The relay, a GRS B type, was replaced; the signals were tested and then returned to service. The relay was sent to the Signal Repair Facility in Roanoke for further investigation, results of which are pending.

133	5/4/1997	CSXT	CTC			Q68402	Signal Mechanism	Oakworth, Decatur, AL	N
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Failed Equipment or Device - Relay

On May 4, 1997 at approximately 2:00 a.m. Signal Maintainer while on a trouble call discovered an improperly displayed Northward Absolute Signal at Oakworth. The signal was displaying a Red over Green aspect while train Q68402 was occupying the O.S. track section. The Signal Maintainer immediately removed the signal system from service. Investigation revealed that the bottom signal mechanism was stuck on the Green aspect. A new signal mechanism was installed and additional test were performed to the Maintainer's satisfaction. The signal system was returned to service. The signal mechanism was sent to a repair facility to determine the cause of the failure with results forthcoming.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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134	5/11/1997	CSXT	CTC			9026	Rusty Rail	OB Cabin, Covington, KY	N
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Cause
Narrative
Loss of Shunt - Possible Rust or Foreign Material on Rail

On May 11, 1997, at 0124 hours, train Q504-09 struck the rear gondola car of the Lott Yard Job, Y235, within the control point limits at OB Cabin on the Cincinnati Terminal Subdivision. Train Q504-09 was traveling northbound through the control point limits at OB Cabin on signal indication. The gondola was occupying the control point track circuit but was not detected due to rusty rail conditions. The incident was investigated by signal personnel on the morning of May 11, 1997. The incident was reported to Mr. Blanchard of the FRA via the FRA Emergency Number at 0700. Mr. Blanchard entered the information on FRA Report No. 386813.

Investigation of the incident showed that at 2302 hours, Y235 shoved a cut of cars into the KC passing siding from the south end, KC Cabin. The crew made arrangements with the dispatcher to protect their movement by lining the N1 signal at OB Cabin. The N1 signal is the northbound signal for the KC passing siding at OB Cabin. The northbound signal at OB Cabin was still lined at the completion of the movement, indicating the control point was not occupied. The dispatcher then put the northbound signal at OB Cabin to stop. At 0123, the dispatcher lined the N3 signal for the movement of Q504-09. The N3 signal is the northbound signal on the number two main line track at OB Cabin. Q504-09 passed the N3 signal and struck the rear gondola car of Y235.

The track relays for the N1 signal, N3 signal, and the KC passing siding were subsequently tested for shunting.

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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156	6/3/1997	UP	CTC			UP804	Switch Circuit Controller	Geronimo, TX	N
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Maintenance - Switch Circuit Controller

On June 3, 1997, at 5:45 CDST, on the Austin Subdivision, northbound LAS49/02 backed into the Geronimo Spur, at MP 219.0 and was in the clear. With the Geronimo Spur switch still reverse, a northbound signal was cleared at CPQ219 for a main line movement over the switch.

An investigation revealed that excess rail movement from loose rail seats and spikes had caused the Switch Circuit Controller cams to roll past, and off of their rollers, letting their normal contacts make and causing a false indication of the switch.

The loose rail seats and spikes were tightened and the Switch Circuit Controller was adjusted. The signal system was restored to proper operation, and all applicable tests were performed.

157	6/8/1997	UP	CTC			UP3924	Electrocode Unit	Valentine, AR	N
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Failed Equipment or Device - Electrocode Module

On June 8, 1997, at 4:30 AM CDST on the Hoxie Subdivision, southbound MCHHO-06 on track 1 observed southbound Signal 3343 at MP 334.5 Green with the next southbound Signal 3367 at MP 336.7 Red.

An investigation revealed that, with the block occupied south of southbound Signal 3367, the Electrocode unit at 3367 was transmitting a Code 4 north to southbound Signal 3343 instead of a Code 2.

The Electrocode unit at 3367 was replaced. The signal system was restored to proper operation, and all applicable tests were performed.

158	6/13/1997	UP	AB			UP1172	None	Crockett, CA	N
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Phantom Signal - Due to Sun Angle

On June 13, 1997, at 19:30 PDST, on the Cal-P line of the Martinez Subdivision, eastbound 2CROCKETT13 on track No. 2 observed a Yellow over Yellow at signal 284, the approach to CP A30, with the home signal at CP A30 Red.

An investigation at the same time of day was made and revealed the bottom head of approach signal 284 was dark, but appeared to be illuminated Yellow from the rays of the sun.

Antiphantom screens were installed to Signal 284 which prevented any further reflections being observed from the sun.

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.

159	6/16/1997	UP		Manual		UP883	None	West Bridge Jct., LA	N
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Phantom Signal - Due to Sun Angle

On June 19, 1997, at 15:22 CDST, on the Alexandria Subdivision at West Bridge Jct., LA, southbound MLINO-16 observed a Yellow dwarf signal for movement from the Yard to UP Long Bridge with a power switch not lined for the movement.

An investigation revealed the sun was shining in the signal and washed out the Red aspect.

The lens was changed and the signal was adjusted so it would display a more plainly lit Red aspect.

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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147	6/25/1997	NS	CTC			6594-8971	Human Error	Parrish, AL	Y
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Human Error - Field Wiring Error, Inadequate Service Testing

At approximately 11:49 PM, Train No. 152, running east on signal indication, derailed on the west end of No. 2 power crossover at Parrish, MP NA-95.6.

The west end switch is a facing point move for eastbound trains. Though the route requested and the signal indication were for a straight move, the west end switch was found to be locked up in the reverse (crossover) position. TC logs showed a normal indication for this crossover since about 3:00 PM that day.

Investigation revealed that a combination of two wiring errors in the Parrish signal bungalow resulted in this accident. The first error, precipitated by an outsider cutting some of the underground cabling, resulted in the crossover correspondence relays being controlled only by the condition of the east end switch. The west end of the crossover had been erroneously patched out of the correspondence circuit. The crossover had apparently been operated this way without incident since June 10th. Then sometime presumably during the early afternoon of June 25th, the motor control straps (in the bungalow) were inadvertently removed from the west end switch while it was in the reverse position. Then when the Birmingham dispatcher requested the crossover normal at about 3:00 PM, the east end threw normal and, due to the first wiring error, picked up the normal switch correspondence relay in the bungalow. The west switch stayed locked up reverse since motor control was absent. With the crossover in this condition likely three trains, running on signal indication trailed through the west switch running westbound on the main track. The trains and approximate times were: No. W73 at about 4:01 PM, No. 319 at about 6:01 PM, and No. 191 at about 8:06 PM. Marks found on the switch point following the derailment indicated that the switch had been run through by at least one westbound move on the main while the switch was laying reverse. The point was probably bent open by this action, and this set up the condition for a derailment on the next eastbound train.

135	7/8/1997	CSXT	CTC			U33730	None	N.E. Waxhaw, Waxhaw, NC	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On July 8, 1997, south bound train U33730 reported to the dispatcher receiving a MEDIUM APPROACH signal at the north end of Waxhaw siding, which was already occupied by south bound train Q61908. The signal should have been RESTRICTING. U33730 did not take the signal. The dispatcher held the trains in position until signal personnel could arrive and investigation.

Investigation by signal personnel confirmed the false proceed indication. The siding track relay was observed coding. The coding was caused by energy supplied from the track isolation unit. The block operates by reversible DC code. The isolation unit would discharge on the off cycle of DC code in the block. The discharge routed through the axle of the approaching train and was the proper polarity to energize the siding track relay, thereby upgrading the signal. The isolation unit was removed from the circuit and the track relay stopped coding. The crossing and signal location were tested for proper operation and the signals placed back in service.

The isolation unit was installed as part of a grade crossing warning device installation. The relays were tested and found to be within specification. Two isolation units were installed at a different point in the circuit to prevent the situation from re-occurring. The signal system was tested for proper operation and found to be functioning as intended.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
116	7/9/1997	BNSF	CTC			LWAS861	Wiring Error	East Columbia River, WA	N	
			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.							
136	7/19/1997	CSXT	CTC			Q591-18	None	S.E. Ames, Ames, IN	N	
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)							
			On July 18, 1997, southbound train Q591-18 was located between the switches at the south end of Ames. The south bound signal was STOP and the train crew observed the north bound signal to be APPROACH. The train was held in position until signal personnel arrived. The signal personnel confirmed the false APPROACH indication.							
			Upon investigation, the signal personnel found the line wire one span north of the north bound signal wrapped. The XC circuit and the 149.6CHD were wrapped, thereby placing 8.8 volts reverse polarity to the north bound signal.							
			The north bound signal went to the proper Red aspect when the wires were unwrapped.							
			The signal personnel were unable to duplicate the problem after clearing the line wrap. The south bound signal continued to stay at Red. After further investigation, signal personnel found the CHD wrapped with the line common at MP 152.2 and MP 152.5. Clearing these wraps cleared the Red southbound signal. The signals were returned to service after testing for proper operation and found to be functioning properly.							
160	7/24/1997	UP	CTC			SP 8280	None	Luling, LA	N	
			Human Error - Improper Equipment Installed							
			On July 24, 1997 at 15:30 CDST, on the Alexandria Subdivision at Luling, LA, northbound FINOLB-23 observed northbound signal 23.7 Green with the next northbound signal at CP L027 Red and a train occupying the track north of L027.							
			An investigation revealed the D biased relay at signal 23.7 had been changed out earlier due to lightning damage with a neutral relay.							
			The relay was changed out to the proper relay, the signal system was restored to proper operation and all applicable tests were performed.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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584	7/25/1997	CR				Train ML 420, Engi	Auto Sig 254S	Northumberland, PA	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

Southbound ML420 reported automatic signal 254S displaying CLEAR with home signal ahead at CP-Norry displaying STOP.

Cause was found to be North and South signal control wires shorted with 120volt AC line to ground due to trees fallen into pole line at mile posts 255.7 and 255.8.

Trees were removed, signal system tested and restored to service.

137	7/31/1997	CSXT	CTC			Q579-31	Signal Mechanism	S.E. Hardy, Hardy, AL	N
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Human Error - Signal Equipment Improperly Installed

On 7/31/97, Q579-31 received a CLEAR indication at the approach signal to the SAS Hardy. The SAS Hardy indicated STOP at the time and no signal had been requested. At 1301 hours, Q579-31 overran the Red aspect at SAS Hardy.

The SAS Hardy was removed from service and subsequently investigated by signal personnel. The Yellow Green Repeater Relay (YGPR) for the SAS Hardy signal mechanism was found energized due to a bent connector pin in the plug coupler assembly. The pin was bent following testing of the signal mechanism by maintenance personnel on the morning of 7/31/97. Voltage on the YGPR sends code back to the approach signal, thereby upgrading the approach signal to display a Green aspect while the SAS was at STOP. The voltage being applied to the YGPR had no effect on the operation of the SAS Hardy.

The signal mechanism and coupler were replaced and signals inspected, tested, and returned to service on 8/1/97.

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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138	8/4/1997	CSXT	CTC			Unknown	None	Deshler, OH	N
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Cause
Narrative
Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On August 13, 1997, the train control group was notified that a south bound train received an APPROACH LIMITED aspect at the approach signal to the south bound absolute signal governing the north crossover at Deshler on 8/4/97. The absolute signal was lined and displayed a MEDIUM APPROACH for the crossover move that was lined. The approach signal should have displayed an APPROACH MEDIUM aspect and was a false proceed indication. The signals were removed from service and signal personnel were dispatched to investigate.

Signal personnel noted that both A and B overlays were not operating and confirmed the false proceed indication viewed by the train. The approach signal is a color position signal with a C marker. The circuit is designed with H and D circuits as well as an A and B overlay on the line wire. The A overlay relay in the energized position gives a flashing C marker at the approach signal to display an APPROACH LIMITED signal for a mainline move. The B overlay relay in the energized position gives a steady C marker at the approach signal to display an APPROACH MEDIUM aspect for a diverging move. The relays are wired so both relays cannot be energized at the same time. A loss of both overlays left only the H & D on the line wire as designed resulted in a flashing C marker for an APPROACH LIMITED aspect into the APPROACH MEDIUM aspect at the absolute signal.

Signal personnel disabled the EOR relay for the C marker until a design revision is engineered.

117	8/6/1997	BNSF	AB			SSW8089 East	Signal 1660	Crowley, LA	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
161	8/10/1997	UP	CTC		ATC	UP5071	None	Nelson, IL	N
<p>Cause</p> <p>Narrative</p> <p>Phantom Signal - Due to Sun Angle</p> <p>On August 10, 1997, at 17:45 CDST, on the Geneva Subdivision at Nelson, IL, eastbound worktrain WNEKCR, at mile post 105, while making a switching move from track 2 through track 3 and track 5 to the yard, ran by a dwarf signal that should have displayed a Red indication but the bulb was burnt out. The train crew claimed the dwarf signal displayed a lunar indication.</p> <p>An investigation revealed with the sun shining in the signal, it gave the appearance of a lunar indication.</p> <p>The dwarf signal is being changed out to a two position colorlight signal on a five foot mast.</p>									
139	8/13/1997	CSXT	APB			Q564-13	None	Mitchell, IN	N
<p>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</p> <p>On August 13, 1997, north bound train Q564-13 occupied the main line between the switches at Mitchell in preparation for a reverse move onto the Indiana subdivision. After stopping short of the north end of Mitchell, the train crew observed the south bound semaphore signal at the north end of Mitchell indicating an APPROACH aspect into their occupied block. The train continued on its route and notified the dispatcher. The signals were removed from service and signal personnel dispatched to investigate.</p> <p>Signal personnel simulated the train movement and observed the south bound at the north end of Mitchell display a Yellow aspect. Investigation revealed that a line wrap with bare wire and heavy brush and rain had caused the false proceed. The negative lock control line wire (L5RGPN) wrapped with HD circuit wire 255.1HD1. The line wrap was combined with a ground due to the brush to give the false proceed.</p> <p>This segment has FRA approval for abandonment. After the line wrap was cleared, the coil wires for all signals were removed and DTC operation was put in place.</p>									
585	8/14/1997	AMTK		Manual			Signal 42L	North Philadelphia, PA	N
<p>Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)</p> <p>At North Philadelphia Interlocking on the NEC in Philadelphia, PA. The tower operator reported a problem with the 42L signal. The C&S forces found the 42L displaying an APPROACH aspect with a train occupying the block. Investigation finds cable conductor 42LAH5 not meeting insulation resistance standards allowing foreign current to energize the 42LAH relay. The circuit was rerouted to good conductors. All appropriate tests were made along with a complete operation check observing all aspects with no exceptions found. Signal was restored to service.</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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148	8/14/1997	NS	CTC			6103	Track Circuit	Peter Cave, KY	N
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At approximately 12:30 AM, Train No. 946 was picking up at the West End of Peter Cave. The crew noticed that with four cars past the westward signal (and occupying the OS), the signal was displaying a CLEAR indication.

Signal personnel were called to investigate and found that the two fouling wires in the OS were broken. This is a shunt fouling circuit, and, without the fouling wires connected, the OS track circuit did not extend back to the clearance joints in the siding. The wires had been broken by the leading end of T&S Gang 23 just before they stopped work on the day before. Signal maintainers working with this gang were unaware that the work had proceeded that far before quitting for the day and had therefore not checked on the condition of these wires. There effectively was a dead section about five car lengths long between the bracket signal and the fouling joints on the turnout side.

The wires were repaired and the track circuit tested for proper operation.

162	8/25/1997	UP	CTC			SP 8574	Battery	Strauss, NM	N
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Failed Equipment or Device - Battery or Circuit Breaker

On August 25, 1997, at 14:00 CDST, on the Lordsburg Subdivision at Strauss, NM, eastbound 1EPLDW.19 had a Flashing Red signal for a move from the siding to the main track before the dispatcher requested the switch reverse.

An investigation revealed a bad set of operating battery causing pumping relays and the siding signal flashing in lieu of steady Red.

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

164	8/28/1997	UP	CTC			CNW 6887	None	Dunlap, IA	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On August 28, 1997, at 11:45 CDST, on the Boone Subdivision at Dunlap, Iowa, westbound APRNP reported the westbound approach signal 299.9 to Dunlap displayed a Yellow over Green indication, and the westbound signal at Dunlap (A304) displayed a Red over Green indication with the switch lined for the siding.

An investigation revealed that the 299BG and N299BG wires were swapped in the signal head at signal 299.9.

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

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
163	8/29/1997	UP	CTC			SP8574	None	Slover, CA	N
			Vandalism - Signal Damaged, Caused Unintended Signal Aspect						
			On August 29, 1997, at 12:45 CDST, on the Mojave Subdivision at Slover, CA, eastbound 1MBKWC.K22 observed a Yellow over Yellow approach signal 487.8 with the home signal at West Slover Red.						
			An investigation revealed vandals had removed the back plate of the lower signal at 487.8, allowing sunlight to shine through, which produced a mistaken Yellow aspect.						
			The signal system was restored to proper operation and all applicable tests were performed.						
165	9/2/1997	UP	CTC			UP 9512	None	Harvard, CA	N
			Human Error - Field Wiring Error, Inadequate Service Testing						
			On September 2, 1997, at 14:00 CDST, on the Los Angeles Subdivision at Harvard, CA, westbound IG2LA/30 observed a Flashing Yellow indication at westbound signal 172.3, and with a Red indication at the next westbound signal 170.5.						
			An investigation revealed that a faulty eyelet on the HDR relay at signal 172.3 shorted the #1 and #2 reverse contacts together which allowed the flasher relay to pick up and operate.						
			The signal was restored to proper operation, and all applicable tests were performed.						
166	9/4/1997	UP	CTC		ACS	UP 6211		Cheyenne, WY	N
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing						
			On September 4, 1997, at 11:20 CDST, on the Sidney Subdivision at Cheyenne, Wyoming, westbound ANPMI-03 observed a Red over Red indication at westbound signal 509.7 while receiving a APPROACH LIMITED cab signal. While approaching signal 509.7, he continued to receive an APPROACH LIMITED cab signal until he passed eastbound signal 509.2 and then the cab signal dropped to APPROACH.						
			An investigation reviewed a circuit error in the cab circuits at eastbound signal 509.2.						
			The signal system was restored to proper operation, and all applicable tests were performed.						

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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140	9/7/1997	CSXT	CTC			U141-05	None	Sessoms, GA	Y
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Human Error - Signal Equipment Improperly Installed

On September 7, at approximately 0950 hours, train U141-05 was traveling southbound over the switch at the north end of Sessoms. The dispatcher, desiring to line a follow-up movement, called for a reverse switch at the north end of Sessoms. The switch began to move to the reverse position while U141-05 was still over the switch, causing the derailment of four cars.

Upon investigation, signal personnel found the TPSR relay hanging by its wires off the front of the shelf in a horizontal position. In this position, the front contacts were on the verge of being closed. The position of the relay and the vibration due to the passing train caused the contacts to close intermittently and the OS track circuit to indicate clear under the train. The OS track circuit falsely indicated CLEAR, thereby allowing the switch to reverse while the train was still over the switch.

The relay had been installed as part of a timing circuit in late June. The relay was not in a cradle or placed on matting. The relay was repositioned and secured. The location was tested in accordance with all FRA and CSX guidelines with no exceptions taken. The location was returned to service upon completion of repairs.

170	9/8/1997	UP	CTC			UP 3347	Switch Machine	North Platte, NE	N
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Maintenance - Switch Circuit Controller

On September 8, 1997, at 05:46 CDST, on the Council Bluffs Subdivision at B283 in North Platte, Nebraska, eastbound ZSEME 05, while making a move from Track 1 to Track 3, had a PROCEED signal with the east switch of the east crossover gapped open approximately one inch.

An investigation revealed the switch had been run through and the switch machine and rods had been damaged and bent in such a manner to allow the machine to lock up and indicate with the point gapped.

The switch machine was replaced, the signal system was restored to proper operation, and all applicable tests were performed.

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

Phantom Signal - Due to Sun Angle

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

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

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

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.

168	9/15/1997	UP	AB			Yard Job	None	Commerce City, CO	N
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Vandalism - Signal Damaged, Caused Unintended Signal Aspect

On September 15, 1997, on the Greely Subdivision at Commerce City, Colorado, the southbound Yard Job reported the northbound signal at milepost 4.0 displayed a Green indication with the track occupied north of the signal.

An investigation revealed that vandals had painted the red lens of the northbound signal at milepost 4.0 with blue paint, which caused the signal to appear to display a Green indication.

The painted lens was replaced with a red lens, the signal system was restored to proper operation, and all applicable tests were performed.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
167	9/18/1997	UP	CTC		ATC	175	None	Chicago, IL	N
<p>Cause</p> <p>Narrative</p> <p>Loss of Shunt - Possible Rust or Foreign Material on Rail</p> <p>On September 18, 1997, at 11:00 CDST, on the Geneva Subdivision at Chicago, IL, the Switch Tender reported the eastbound signal 3.8 on #1 Main Track was Green with the track occupied east of the signal.</p> <p>An investigation revealed a rusty rail condition was preventing the track circuit from shunting while occupied.</p> <p>The track relay was adjusted and a stainless steel bead will be welded to the rail. The signal system was restored to proper operation, and all applicable tests were performed.</p>									
169	9/22/1997	UP	AB			SSW9627	None	Fort Worth, TX	N
<p>Human Error - Field Wiring Error, Inadequate Service Testing</p> <p>On September 22, 1997, on the Dallas Subdivision at Fort Worth, TX, westbound ZMEL/21 on track #1 observed a Green signal aspect at westbound signal T246, and Red signal aspect at the next intermediate westbound signal 246.3, with the track occupied west of 246.3.</p> <p>An investigation revealed the polarity was reversed on the "D" relay coils for signal T246.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</p>									
120	9/26/1997	BNSF	AB			SF3680	Signal 1401	Elks DTC Bolck near Lafayette, LA	N
<p>Vandalism - Pole Line</p> <p>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.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
172	9/27/1997	UP	AB			None	None	Shreveport, LA	N	
			Vandalism - Pole Line							
			On September 27, 1997 on the Reisor Subdivision at Shreveport, Louisiana, the northbound signal 315.7 at milepost 315.6 (Hollywood Junction) was observed to display a Green aspect with the track north of the signals occupied.							
			An investigation revealed scrap wire, laying on the pole line north of signal 315.7, shorting and false feeding signal control circuits.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
171	9/29/1997	UP	CTC			SP 8007	Code Relay	Lasca, TX	N	
			Failed Equipment or Device - Relay							
			On September 29, 1997 at 04:40 CDST, on the Valentine Subdivision at Lasca, Texas, eastbound 11LAAV/23, on the main track at mile pole 746.1, observed a Green eastbound signal at the west end of Lasca, with a Red eastbound signal at the east end of Lasca.							
			An investigation revealed a bad order 180 code relay at west end of Lasca was responding to 75 code.							
			The signal was restored to proper operation, and all applicable tests were performed.							
122	10/1/1997	BNSF	CTC				3E Signal - Searchlight Mech	Mississippi St. Control Point, St. Paul, MN	N	
			Vandalism - Signal Damaged, Caused Unintended Signal Aspect							
			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.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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587	10/5/1997	IMRL	CTC			IMRL 218	None	Deer Creek, Iowa	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

On October 5, 1997, Engineer on train 98K 04 reported that he observed the eastward absolute signal at East Deer Creek as displaying a Yellow aspect. The propped aspect for the eastward absolute signal at East Deer Creek at this time was Red. This signal had not been lined by the dispatcher.

Signal Department personnel were immediately called to investigate this incident. Personnel performing operating tests and were unable to duplicate this incident. Personnel viewed the log report and replayed the events as they occurred from the CTC Computer System which indicated the eastward absolute signal at East Deer Creek was never lined for train 98K 04.

The only exception found by Signal Department personnel was the hood was not secured on the lower light unit. This condition is still under investigation to determine if the reflection from the sun could have [ends in mid-sentence]

123	10/8/1997	BNSF	CTC			UINBROO108	None	Towal, WA	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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124	10/9/1997	BNSF	CTC			STACBPA109	None	Wishram, WA	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

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.

588	10/10/1997	CR				Eng 707	Cab Signal	Westfield, MA	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

TV-6 Engine 707 reported cab signal upgraded from RESTRICTING to CLEAR when light engine 6574, east ahead cleared the main track at an electrically locked hand operated switch with the switch still in the reverse position. Cause was found to be improper design which did not open the cab generating circuit with the WP down. The circuit was redesigned, field changes were made, all circuits were tested and the signal system was returned to service.

125	10/14/1997	BNSF		Remote		Train ID # CJRKC	Phantom Signal	Lincoln, NE	N
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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.

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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141	10/14/1997	CSXT	CTC			A013-14	None	Horn Industrial Track, Elberton, GA	N
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Human Error - Signal, Improper Lenses Installed

On October 15, the engineer of work train A013 mentioned during a conversation with signal personnel that there was a problem with the dwarf signal on the Horn industrial track at the south end of Norman on the Abbeville subdivision. The engineer said that he had received a Yellow aspect to exit the industrial track onto the occupied siding. The proper signal should have been a lunar aspect for RESTRICTING speed. The signals at the south end of Norman were suspended pending investigation.

Investigation revealed that the engineer had received a Yellow aspect to exit the industrial track onto an occupied siding. The signal should have been a lunar aspect indicating a RESTRICTING signal. The wiring in the location was according to plan. Discussion with the signal design group revealed that the Yellow lens had never been changed to a lunar when the operating rules were changed.

The Yellow lens was changed to a lunar and all circuit wiring was verified to plans. The location was placed back in service following a complete operational test.

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

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
173	10/22/1997	UP	AB			UP 3592	Switch Circuit Controller	Boracho, TX	N
<p>Cause</p> <p>Narrative</p> <p>Maintenance - Switch Circuit Controller</p> <p>On October 22, 1997 at 21:00 CDT, on the Baird Subdivision at Boracho, Texas, westbound IDALB 21, on the main track, reported westbound signal 708.1 Green with the spring switch in the next block at MP 710.0 lined reverse.</p> <p>An investigation revealed a bad order switch circuit controller at the spring switch.</p> <p>The switch circuit controller was replaced. The signal system was restored to proper operation, and all applicable tests were performed.</p>									
127	10/25/1997	BNSF	CTC			VKCKPHX123, Eng	2W Signal	Canyon Diablo, AZ	N
<p>Human Error - Signal Circuit Design Error, Inadequate Service-Testing</p> <p>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.</p>									
174	11/5/1997	UP	CTC			UP 9367	Shunt Wires	Falls City, Nebraska	N
<p>Maintenance - Switch Shunt Wires Broken</p> <p>On November 5, 1997 at 12:10 CDT, on the Falls City Subdivision in Falls City, Nebraska, at Control Point Z384, northbound ZMESE 03 on the main track had CLEAR signals with the siding switch of a crossover movement.</p> <p>An investigation revealed the shunt wires were broken at the siding switch of the crossover at MP 384.4.</p> <p>The shunt wires were replaced. The signal system was restored to proper operation, and all applicable tests were performed.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
175	11/14/1997	UP	AB			SSW 9690	Semaphore Signal Air Valve	Carrizozo, NM	N	
			Failed Equipment or Device - Semaphore Signal							
			On November 14, 1997 at 03:58 CST, on the Carrizozo Subdivision at Carrizozo, New Mexico, westbound IGTWC-05 observed a Green approach Semaphore signal 1441.5 to a Red signal 1440.3 at the east end of Carrizozo.							
			An investigation revealed a plugged air valve in the Semaphore signal 1441.5 did not let the signal move to a Yellow position.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
589	11/20/1997	CR		Remote		None	Home Signal 5W	Cleveland, Ohio	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			Signal 5W was observed by a Signal Maintainer as Green over Green, CLEAR, with 4 switch reverse. Signal should have been Green over Red, SLOW CLEAR.							
			Cause was found to be a design error, which allowed the signal control relay for the bottom aspect of 5W signal to be energized whenever 11 switch was lined normal. Design changes were made, signals were tested, and returned to service.							
128	11/22/1997	BNSF		Manual		SPOALB		Loc. CP 143, Pasco, WA	N	
			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.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
590	12/2/1997	AMTK	AB			101	3BSA Relay	Phila., PA	N
<p>Cause</p> <p>Narrative</p> <p>Human Error - Field Wiring Error, Inadequate Service Testing</p> <p>Amtrak train no. 653 engine no. 101 traveling west on no. 3 track passed auto signal no. 69. Auto signal 69 on no. 3 track was observed displaying APPROACH with the block occupied. C&S forces investigating found the "3BSA" relay not wired properly. The relay was replaced. All appropriate tests were made along with a complete operational check. Signal 69 was returned to service with no exceptions. Disciplinary actions have been initiated to prevent any reoccurrence.</p>									
177	12/5/1997	UP	CTC			CSX T8603	None	AMA Jct., LA	N
<p>Human Error - Field Wiring Error, Inadequate Service Testing</p> <p>On December 05, 1997 at 04:23 CST, on the Alexandria Subdivision at CPL021, AMA Jct., LA, southbound MLINOB/04 on track #1 observed a Yellow over Red signal with the track ahead occupied.</p> <p>An investigation revealed the HR relay output and relay common wires swapped between track 1 and track 2 at LO21.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</p>									
176	12/5/1997	UP	CTC			CNW 8830	None	Sheep Creek, WY	N
<p>Loss of Shunt - Possible Rust or Foreign Material on Rail</p> <p>On December 05, 1997 at 12:53 MST, on the North Platte Subdivision at CPW195 in Sheep Creek, WY, westbound CNWNA-01, making a move from track #2 to track #1, observed the signal change from Red over lunar momentarily to Red over Green and then back to a Red indication with the track occupied in front of him.</p> <p>An investigation determined a temporary loss of shunt of the light engine on the main track west of W195 caused the momentary proceed indication.</p> <p>All applicable tests were performed.</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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178	12/11/1997	UP	CTC			UP 3539	None	Pace, MO	N
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Vandalism - Signal Damaged, Caused Unintended Signal Aspect

On December 11, 1997 at 09:25 CST, on the Sedalia Subdivision at Pace, Missouri, eastbound MKCAS-09 observed the eastbound approach signal on track #1 at milepost 59.0 indicating a Yellow over Yellow signal, with the eastbound home signal on track #1 at CP M058 indicating a Red signal.

An investigation revealed the eastbound approach signal at milepost 59.0 had a bottom signal head that has one light which is yellow. The access door to the bottom signal head was open and sunlight shining into the back of it gave the appearance of a Yellow signal on the bottom head.

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

591	12/16/1997	CR	CTC			MAIL 8M, Eng 5564	Signal 2E	Nasby Interlocking, Toledo, OH	N
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Human Error - Field Wiring Error, Inadequate Service Testing

Crew of MAIL-8, located on the siding west of Nasby Interlocking, Chicago Line, MP 272, observed signal 2E on Track 2 displaying APPROACH with MAIL-8M head end in the interlocking and the rear end west of the plant on #2 Track. Cause was found to be improperly wired contacts on the 2HPR polar relay. This allowed lighting energy to hold up the SR relay when AC power was off. The additional wire was removed from the relay, all appropriate tests were performed and the signal system returned to service.

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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149	12/30/1997	NS	CTC			8808-8677	Phantom Signal	Pearisburg	N
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Phantom Signal - Due to Object in Foreground or Background

At approximately 3:10 PM, Train No. 817 reported to the dispatcher that they had received an APPROACH DIVERGING westbound at signal 327.5, but when they arrived at the next signal, Control Point Pearisburg, the signal there was at STOP. The switch was lined normal (correct for their move), but the dispatcher had not yet requested a signal at Pearisburg for their move. Signal 327.5 should have been displaying APPROACH. No. 817 got stopped 35 cars lengths past the signal. No other trains were involved.

Signal personnel were called to investigate, but could not find a problem or duplicate the incident. The signal control on the single track approaching Pearisburg is by Electrocode 4. Signal 327.5 is a right hand ground mast colorlight. It has a three position head over a single green head which is illuminated only for APPROACH DIVERGING. All heads are phankill equipped. As the train crew said the bottom green appeared weak, a test was scheduled for the same time the following day for a possible phantom signal. That test did show a weak (whitish) phantom green on the normally dark head that was found to be caused by reflection from heavy snow on the ground in front of the signal. The sun at the time was about 40-degrees up and to the back of the signal in question. As the sun went down, the reflection got dimmed, disappearing altogether by 4:00 PM. The bottom head was turned to the field until the snow was gone.

150	12/31/1997	NS	CTC			9004	Signal Lens	Cleveland, TN	N
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Vandalism - Signal Damaged, Caused Phantom Aspect

At approximately 7:00 AM, Train No. Q26, while running eastbound on the siding between Control Points Bradley and Lyle, went by the eastward signal at Lyle while it was displaying STOP. The engineer was able to come to a stop one car length past the signal into the OS at Lyle. No other trains were in the area, and the signal had not been lined for No. Q26 to leave the siding onto single track. Both crew members reported they observed the signal to be displaying DIVERGING APPROACH when they were about 50 cars west of it. Once they were within 5 car lengths of the signal, they said they saw it drop to STOP so came to a safe stop. Signal personnel were called to investigate.

The signal system for Lyle is TC with the control station at Knoxville, TN. Lyle is the last control point when traveling east and eastbound moves must have both a permissible signal and a track warrant to proceed east. The signal system east of Lyle is APB with Electrocode II electronic track circuits. The signal system from Lyle west is TC with underground HD circuits. Q26 was in the siding which is a controlled siding so his approach to Lyle would have been RESTRICTING. Q26 did have track warrant to proceed, but no signal had been lined at Lyle for their movement. The signal is a ground mounted 3 aspect type "D" dwarf signal capable of displaying Red over Green (DIVERGING CLEAR), Red over Yellow (DIVERGING APPROACH) and Red (STOP). The three aspect signal had a red in top, green in the middle and yellow on the bottom.

All appropriate FRA and operational tests were performed with no exceptions. However, it was observed that the red inner lens was cracked and the lamp voltages were a little low. Believing that this could have contributed to a phantom signal, the dwarf signal was left out of service until sight tests could be performed the next day at 7:00 AM. Those tests were performed and it was found that the red dwarf signal did appear from 6-7.5 to 8.0-9.5 volts. Then the signal was rechecked and found to be displaying proper aspects at all distances where it could be seen.

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.

592	1/5/1998	CC		ATS			FP-CL	East Absolute C.L. Signal, Lake Oley	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

False proceed signal east absolute C.L. signal Lake Oley.

On 1/5/98 at 20:12:00 EB train I12 reported a cab and field signal CLEAR 5 car lengths west of Lake Oley and did not drop Red until the westbound was at Best Wall switch at MP 371.7. The WB CC2000 train reported CLEAR signals from Dumcombe to first Red at 371.7.

There were 2 H wires wrapped together at MP 372.1. The insulator was broken possibly due to the ice, which caused the wires to wrap. Trouble cleared at 22:45.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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201	1/10/1998	UP	AB			UP 6060	AK Card in Electrocode Unit	5 Miles South of Ogden Jct., TX	N
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Failed Equipment or Device - Electrocode Module

On January 10, 1998, at 06:00 CST, on the Austin Subdivision, south of Ogden Jct., Texas, northbound MLDLI 09, on track 2, observed northbound signal at Mile Post 241.6 Green with the next northbound signal at Mile Post 238.4 Red and the track north of Mile Pole 238.4 occupied.

An investigation revealed a defective 4K card in the Electrocode unit at Mile Post 241.6.

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

437	1/11/1998	CSXT	CTC			Z35610	N/A	NAS Wauhatchie, Chattanooga, TN	N
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Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)

On Sunday, January 11, the AJ dispatcher line Norfolk Southern (NS) NAS Wauhatchie on the Chattanooga Subdivision for NS train Z35610. Z35610 passed the Wauhatchie signal at 0034 and passed a STOP signal at Wildwood at 0040. The signals at NS NAS Wauhatchie were removed from service.

A re-enactment of the situation by signal personnel revealed that the aspect at NS NAS Wauhatchie had improperly displayed a MEDIUM APPROACH MEDIUM (R/Y/FG) instead of MEDIUM APPROACH (R/Y) into the STOP aspect at NAS Wildwood. Further investigation revealed a ground in the twist wire that had been installed to temporarily repair the code line due to a recent wire theft. The wire had been damaged by placement of new rail beside the track. The ground caused 4.5 VDC to be placed on the 2RD relay at Wauhatchie. The improperly energized RD circuit caused a Flashing Green signal to be displayed at Wauhatchie in addition to the R/Y signal.

The circuit tested clear after the wires were repaired and the signals returned to service. Electronic track circuits were installed in this section and placed in service on January 21.

593	1/11/1998	KCS	CTC			NS 314 A7	A04XTR	Meridian, MS	N
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Failed Equipment or Device - Relay

At 02:30 hrs on 1/11/98 Norfolk Southern's NS 314 A7 was traveling north on the NS northbound main at Meridian, MS and reported they received a Yellow aspect at signal 04, when they reached the crossover they realized that #6 Switch was lined against their move.

Please see attached memo from Signal Supervisor for details of investigation, the problem found and the preventative action taken. Also attached is a track diagram of this location.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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180	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.

595	1/14/1998	INOX		Automatic		None	1342 Approach Signal	Lima, Ohio	N
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Human Error - Field Wiring Error, Inadequate Service Testing

Approach Signal 1342 on northbound approach to the Conrail Sugar Interlocking, Lima, Ohio displayed a Green aspect into a Red home signal at the interlocking. This condition was caused by the control wires 1342 HD and N1342 ND having been transposed where the line wire and aerial cable junction at MP 133.45. This condition was discovered about 9:00 A.M. on 1/14/98 and corrected and placed back into service at 2:30 P.M. The discovery of the false proceed was made by RailTex and RCL signal personnel while making routine tests of the system. It is unknown how long this condition existed, but it appears to have been wired in when the aerial cable was installed several years ago. RailTex acquired this property less than a year ago from the Grand Trunk Railroad.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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594	1/14/1998	INOX		Automatic		3802	Approach Signal #8	Liberty Center, OH	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

It was reported by the train crew on train no. 261-14 that they received a Green approach signal northbound at signal #8, MP 82.22 into a Red-over-Red home signal at the interlocking. This was confirmed by the signal MTR who was near the interlocking at the time of the report. The signals were taken out of service and the incident was investigated by both RailTex and RCL personnel. After the signal, MTR duplicated the false proceed by placing a shunt in advance of the approach and witnessing the Green into a Red. Further attempts to duplicate the incident failed. The pole line was walked out and at MP 82.9, it was found that the 8HR1 and 8DR1 were untied on the pole and nearly touching by means of a tie wire. This would cause both the 8DR and 8HR relays to be energized simultaneously, causing a Green into a Red.

182	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.

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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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438	2/28/1998	CSXT	CTC			Q21327	None	Potomac Run, Fredricksburg, VA	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On February 28, 1998, Q21327 was traveling south on the RF&P subdivision on signal indication. The engineer called a CLEAR signal at the Potomac Run intermediate signal (633A). He noticed that the cab signal displayed APPROACH as the train passed signal 633A. The crew proceeded observing the most restrictive indication, the cab signal. The crew notified the dispatcher of the conflicting indications. The signals were removed from service.

Signal personnel were dispatched to investigate. The investigation revealed that the wrong relay had been altered during a consolidation of stand alone dragging equipment detectors to a combined equipment defect detector at Ross. The alteration to the DR relay vice the DEDPR relay resulted in the signal displaying a CLEAR aspect whenever code was received at the signal. The signal did display a Red aspect when no code was received at the signal.

The circuit was rewired to alter the DEDPR relay and the signal was returned to service after all operational checks were completed.

203	3/7/1998	UP	CTC			Amtrak #6	None	Citrus Heights, CA	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On March 7, 1998 at 1000 PST, on the Martinez Subdivision at Citrus Heights, CA, eastbound Amtrak #6, on the main track and was lined from 2 Tk to 1 Tk, observed the approach signal 2E to Citrus Heights at MP 99.4 Green with the Home signal at Citrus Heights Red over Green.

An investigation revealed the pole change wires on the FYR at signal 99.4 were reversed causing incorrect polarity to the HPR relay.

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

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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192	3/10/1998	NS	CTC			UP 2961	Poleline	Sidney, IL	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

At approximately 8:55 PM, westbound train No. 71 reported the distant signal to East Sidney, displayed ADVANCE APPROACH and the East Sidney home signal displayed STOP. The 325.8 signal should have displayed APPROACH because East Sidney had not been lined for No. 71's move due to train No. 409 working between the switches at Sidney.

Signal personnel called to investigate confirmed the ADVANCE APPROACH aspect into a STOP. This was caused by false energy on the 3258BH relay that controlled the bottom yellow. The false energy was the result of a line wrap between the 3258BH wire and the 32695TP wire at milepost B-327.1. Though the two line wires were tight and tied-in, we suspect the 50 MPH + wind gusts on the previous day had blown something into the line resulting in the wrap. The wrap was removed, the signal system verified to be working as intended, and signals were returned to service at 12:45 AM, 3/11.

To keep this from recurring, the ADVANCE APPROACH aspect has been eliminated on this signal. Instead of getting an ADVANCE APPROACH when East Sidney is APPROACH, signal 325.8 will repeat the yellow at East Sidney. This is a temporary fix since the poleline is to be eliminated and aspects will change in conjunction with a new NS/UP connecting track to be installed here in the near future.

596	3/11/1998	AMTK		Remote		NA	63R	West Cambridge, MA	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

Mr. James Hoffnagle of the FRA reported to [redacted] Assistant Division Engineer C&S MBTA for Amtrak, that signal 63R at West Cambridge Interlocking displayed APPROACH MEDIUM with a route displayed over #52 crossover which is a #15. It was determined that circuit design of the 63R would allow APPROACH MEDIUM aspect to be displayed thru the #52 crossover reverse. Circuitry was redesigned, operational tests made and no exceptions taken.

204	3/11/1998	UP	CTC			UP 8197	None	Colton, UT	N
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Loss of Shunt - Possible Rust or Foreign Material on Rail

On March 11, 1998 at 2300 MST, on the Provo Subdivision at Colton, Utah, eastbound CTVSV-04, on the main track, observed the eastbound signal at MP 644.7 display a momentary Green with the track circuit east of the signal at MP 644.7 occupied.

An investigation revealed momentary loss of shunt in the occupied track circuit east of signal at MP 644.7 caused the momentary Green signal at eastbound signal at MP 644.7.

All applicable tests were performed.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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193	3/16/1998	NS	CTC			8945-6678	Poleline	Clymers, IN	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

At approximately 3:45 PM, train No. 183, running westbound, reported receiving a CLEAR signal at the East End Clymers and then a STOP signal at the West End Clymers. Being in radio contact with opposing train D93 west of Clymers, they were aware of the false signal and were able to stop before passing the STOP signal.

Signal personnel were called to investigate and found from TC loggers that there was an indication of a westward signal lined at West End Clymers, not requested by the dispatcher, at the time that train 183 saw the CLEAR at East End Clymers. In the field, the same scenario was set up and proved that a westward CLEAR was displayed at East End Clymers while a STOP was displayed at West End Clymers. The cause was a falsely energized 500 ohm relay (LAYGP) at West End Clymers which resulted in the improper pole change back to East End Clymers. The relay was falsely energized by three volts caused by two separate line wraps in two different spans within the plant at West End Clymers. The LAYGP also tumbled down the eastward signals on train D93 and gave the false indication of a westward signal at West End Clymers.

The wraps were corrected and the system retested to verify proper operation. The line wires involved were properly slacked and tied in. It was suspected, but never proved, that a truck hit a pole and caused at least one of the wraps. High winds in this area on previous days were suspected of causing the first wrap. Neither wrap on its own would have caused this problem.

597	4/3/1998	SCRA	CTC			Eng. #876	EC-4H/VHLCprog.	Glendale, CA	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

Added "Joint Hop Logic" to Executive Software [see printed report]

205	4/23/1998	UP	CTC			UP 469W	None	Centertown, MO	N
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Phantom Signal - Due to Sun Angle

On April 23, 1998 at 10:10 CDT, on the Sedalia Subdivision at Centertown, Missouri, westbound WPFLWB21, while stopped in the siding 200 yards east of control point M142, observed a Yellow indication from the signal to leave the siding, with the switch lined normal.

An investigation revealed a phantom indication in the signal to leave the siding was caused by the sunlight washing out the Red signal and making it appear Yellow.

Shields were applied preventing the phantom signal, and all applicable tests were performed.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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439	4/24/1998	CSXT	CTC			Q21922	None	Godsend, Fostoria, OH	N
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Human Error - Field Wiring Error, Inadequate Service Testing

At about 10:48 AM on April 24, 1998, the crew on train Q21922 viewed a CLEAR aspect on the #10 signal (LE&W) westbound on number one track at Fostoria, Ohio and a LIMITED CLEAR aspect at the absolute W1 signal at Godsend. The crossover was reversed for a movement from number one to number two track. The aspect should have been an APPROACH into a LIMITED CLEAR. The signals were removed from service pending investigation by signal personnel.

Signal personnel investigated the problem and verified the aspects as described above. The problem was identified as a wiring problem in a temporary case. The temporary case contained an Electrocode 4H. The wire for the Code 7 decoder was on the Code 3 decoder post. This caused the false proceed. The wire was returned to its proper post. Operational tests were performed and the signals were returned to service on April 25, 1998.

206	4/30/1998	UP	CTC			SP 6823	None	near Millican, TX	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On April 30, 1998 at 16:30 CDT, on the Ft. Worth Subdivision, north bound RSPOG 29 observed a Yellow over Green indication at the north bound approach signal at MP 56.8 with the next north bound home signal at control point Q058 displaying a Red over Yellow indication with the track lined for the siding.

An investigation revealed the north bound signal at MP 56.8 should have displayed a Yellow over Yellow indication with the control point Q058 lined into the siding.

The north bound signal at MP 56.8 was changed to display a Yellow over Yellow indication with the control point Q058 lined for the siding. All applicable tests were performed.

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

598	5/4/1998	RBMN	AB			2396	C1741A	Dupont, PA	N
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Vandalism - Signal Mechanism Shot - Stuck in Position

Signal C 1741, MP 174.1, Lehigh Main Line was observed by an eastbound train displaying APPROACH while the block it governed was occupied.

Investigation revealed that the signal was vandalized by trespassers throwing rocks, breaking the lenses causing glass to fall into the SA mechanism lodging it in the Yellow position.

Lenses and mechanism were replaced and signal tested and restored to service.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
194	5/5/1998	NS	CTC			6626-8947	Arrestor	Carbo, VA	N
<p>Failed Equipment or Device - Lightning Arrestors, Shorted</p> <p>Train No. J62U705, operating the two units as a pusher, had entered the CV main off the west leg of the wye at Carbo on signal indication. After he moved from unit 8947 to unit 6626 to change direction, the Engineer observed he had an APPROACH DIVERGING for his eastbound movement at Carbo. Shortly after he started his eastbound move, the CV dispatcher contacted him giving him permission to pass the next signal into the siding at Mill Creek and couple to train No. 572. When the Engineer told the Dispatcher that his last signal displayed APPROACH DIVERGING instead of APPROACH, the dispatcher had him stop his train and then called signal personnel to investigate.</p> <p>Signal personnel arrived and had train No. J62U705 back west of the signal at Carbo. They then had the dispatcher set up the same scenario and were able to see the false proceed about five minutes later. Investigation revealed that there were three badly burned lightning arrestors in a pole mounted junction box at Carbo. Each of these arrestors was partially grounding the circuit to which it was attached. One was on the BP circuit which had 12 VDC on it at the time. The positive side of the BD relay for the eastward signal was also grounded by one of these arrestors and had 5.2 volts on it which was found to be coming from the BP circuit ground. The arrestors were replaced and the signal system tested for proper operation before being returned to service.</p> <p>A recent lightning storm had likely caused the multiple ground condition by severely burning these three arrestors.</p>									
599	5/14/1998	CR	AB			SFEL3	Sig. 425.4	Elkhart, IN	N
<p>Failed Equipment or Device - Insulated Joint(s)</p> <p>Automatic signal 425.4 displayed APPROACH aspect with train in block. Cause was found to be two shorted insulated joints and an open track wire from switch circuit controller allowing 9ct track relay to become energized with battery from adjacent track circuit.</p> <p>Corrective Action: Installed biased track relay and insured opposite polarity across insulated joints.</p>									
600	5/15/1998	CR		Remote		Unknown	Signal 6W-4	Toledo, OH	N
<p>Human Error - Signal Circuit Design Error, Inadequate Service-Testing</p> <p>Signal 6W-4 at Nasby Interlocking displayed a SLOW CLEAR aspect with signal 1WB ahead at STOP. Cause was found to be a design error which omitted a #3 switch in the home network of signal 6W-4. The controls for 6W-4 signal have been opened in the field to prevent 6W-4 from displaying better than SLOW APPROACH. New design will be issued, installed and tested as soon as practicable.</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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601	5/17/1998	INOX	CTC			3807	60R	Cincinnati, OH	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On May 17, 1998 at approximately 07:00 AM vandals set fire to a pole and cables at Mile Post 10.9 Ridge Interlocker. The signal Maintainer was called at 9:00 AM and found the power and 7 conductor destroyed. Repairs began about 12:00 PM and were complete about 06:00 PM. During reconnection the H's for the 60R signal were transposed, which gave a Green signal instead of a Yellow into a Red. The signals were put back into service.

At 10:45 PM the Signal Dept. was informed of the false proceed and took the signals out of service. The problem was found and corrected. The signal system was tested and put back into service.

195	5/25/1998	NS	AB			9057	Design	Hattiesburg, MS	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

At approximately 4:30 AM train No. 314 reported a CLEAR signal northward at Hattiesburg Interlocking and a STOP indication at the next signal, N.E. Hattiesburg.

No. 314 had left part of its train on the main south of the interlocking and proceeded on signal indication north of the N.E. Hattiesburg. They then reversed the switch and made a reverse move into Hattiesburg Yard to make a pick up. After returning to the main and restoring the switch, No. 314 moved southward with the proper Red signals at N.E. Hattiesburg and Hattiesburg Interlocking to couple to their train. They then proceeded north with a CLEAR at the interlocking and found a STOP at the N.E. Hattiesburg.

Investigation revealed that a southbound movement at N.E. Hattiesburg when cars were occupying the track south of Hattiesburg Interlocking enabled a circuit path at N.E. Hattiesburg permitting a CLEAR code back to the interlocking while a STOP was displayed at the N.E. Hattiesburg. The design was corrected and the signals were thoroughly tested.

207	5/27/1998	UP	AB			SP 7798	None	Pence, IL	N
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Vandalism - Signal Damaged, Caused Phantom Aspect

On May 27, 1998 at 17:59 CDT, on the Chicago Subdivision at CP 1050, southbound ZYCFW 27 had a CLEAR signal through the Pence interlocker, while a westward Conrail crew reported a Green over Red home signal at Pence interlocker.

An investigation revealed that Conrail's westbound high green signal's back door was open, and the sun shining through gave a Green indication.

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

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
602	6/5/1998	CR		Remote		CSXT 913	Home Signal 8W	Buffington, IN	N
<p>Cause</p> <p>Narrative</p> <p>Vandalism - Signal Damaged, Caused Phantom Aspect</p> <p>Crew on CSXT 913 reported signal 8W at CP 501 displayed Red over Lunar White (RESTRICTED PROCEED) with a westbound Amtrak train occupying interlocking. Investigation found that vandals had broken the lock and hasp and removed the cover from the center lunar light unit on signal 3W allowing sunlight to enter the rear of the unit which illuminated the white lens. Cover was replaced and local police notified.</p>									
603	6/18/1998	CR	CTC			CP 5616	Auto. Sig. 94E	Castasauqua, PA	N
<p>Human Error - Field Wiring Error, Inadequate Service Testing</p> <p>Signal control wires terminated in switch location junction box reconnected on opposite terminals reversing polarity and allowing Sig. 94E to display CLEAR with signal 2E at CP Caty at STOP. Wires were properly connected, all tests performed and signal system returned to service.</p> <p>Investigation is being held to determine responsibility.</p>									
440	6/22/1998	CSXT	CTC			Q50321	None	NE Weston, Weston, OH	N
<p>Human Error - Field Wiring Error, Inadequate Service Testing</p> <p>On June 22, 1998, the southbound Q50321 reported a CLEAR signal at the NE Weston and a STOP signal at the SE Weston. The signals were removed from service and signal personnel dispatched to investigate. The situation was simulated by the signal personnel and the false clear was confirmed. The investigation revealed that reverse polarity on a pair of HD wires had caused the false clear signal. The polarity of the HD wires was corrected and the signal system was tested and returned to service.</p> <p>A signal maintainer was called to investigate a problem at the SE Weston on June 14. The maintainer identified the problem as an open in the HD lines and changed to a pair of spare wires. He placed two spare wires on each of the open cable wires marked R22HD4 and NR22HD1. He then went to the Taylor St. crossing warning system and jumpered the wires together to complete the circuit from the SE Weston. The maintainer checked voltage to verify the circuit but failed to perform an adequate operational test of the circuit before returning the signals to service. The polarity of the circuit was inadvertently swapped by the maintainer. This was determined to be the cause of the false clear.</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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196	6/24/1998	NS	CTC			CR 6116	Vandalism	Westminster, SC	N
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Vandalism - Signal Damaged, Caused Unintended Signal Aspect

At approximately 8:15 AM, train No. 266 was northbound on Track #1 when the crew observed the signal on Track #2, signal 532.2, displaying what appeared to be an APPROACH DIVERGING, Yellow over Green. Since they had a CLEAR signal on their track, they knew they were lined onto single track at Jason, and the signal on Track #2 should not have been better than APPROACH. They reported this as a false proceed to the dispatcher.

Signal personnel were called to investigate and found that the door was open for only the green aspect in the bottom color light unit. Sunlight was shining through the lens on this signal that was facing almost due west due to the track alignment at this point. Compounding the incident was the fact that the bottom red which should have been lit was burned out. Had the bottom red been lit, this would have been an improper signal.

The screw-lock that secured the signal doors had been removed, apparently by an outsider. The signal was secured with a padlock to prevent recurrence.

208	6/24/1998	UP	CTC		ACS	6201	None	Rawlins, WY	N
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Phantom Signal - Due to Sun Angle

On June 24, 1998 at 18:27 MST, on the Laramie Subdivision at MP 681.2, eastbound AMLKCX 22 reported the eastward signal from the South Runner to the #2 Main was Red over Yellow into a normal switch.

An investigation revealed that the sunlight washed out the lower red aspect and it appeared to be a Yellow aspect.

Phantom screens were installed, the signal system was restored to proper operation, and all applicable tests were performed.

604	7/9/1998	CR		Remote		Amtrak 286	Home Signal 1WB	Albany, NY	N
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Human Error - Signal Equipment Improperly Installed

Westbound Amtrak 286 reported CLEAR signal with the switch normal on 1WA signal at CP 146 and he observed a Red, Red, Green SLOW CLEAR signal on 1WB signal out of the siding. Investigation revealed that the contacts on the 3RWCR B2 plug in relay were shorting together allowing energy to pick the 1WBCHR. It was determined that the relay had been removed from the plug board 2 days earlier to be tested and that the contacts were bent when the relay was reinserted into the plugboard.

Relay was replaced, all tests performed and the interlocking was returned to service. Discipline will be assessed to involved employees.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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209	7/9/1998	UP	APB			UP 2256	Switch Circuit Controller	Conway, AR	N
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Maintenance - Switch Circuit Controller

On July 09, 1998 at 00:30 CDST, on the Coffeyville Subdivision at the south end of Conway, MP B371.9, northbound Local LVR56-08 stopped and lined the switch for the siding and observed the northbound signal stay Green.

An investigation revealed that the switch circuit controller rod had fallen off the controller.

The switch rod was replaced, the signal system was restored to proper operation, and all applicable tests were performed.

441	7/17/1998	CSXT	CTC			U241	None	Three Mile, Mobile, AL	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

Shortly before 0800 on July 17, a signal maintainer was dispatched to the scene of a run through electric lock switch just south of Three Mile Drawbridge. The signal maintainer arrived at 0830 and found southbound train U241 stopped just north of SAS Three Mile with a STOP aspect. Shortly thereafter, SAS Three Mile changed to a CLEAR aspect. The maintainer observed the switch operating handle vertical and immediately checked the NWPR. The maintainer removed the signals from service upon finding the NWPR deenergized.

Investigation determined that a design defect caused a CLEAR signal to be displayed with the A-BNWPR deenergized. The A-BNWPR protects the electric lock switch which was installed as part of a speed increase early in 1998. The A-BNWPR was rewired to be in series with the lock time relay, track release circuit, and H+ input of the HD polar adapter. The HD polar adapter device is configured to provide a reverse polarity output when there is battery input to the H+ terminal. A normal polarity output is given when there is battery input to the D+ terminal. A battery input to the H+ terminal is not required for normal polarity output.

The defect was corrected by relocating the track A-BNWPR, WLTER, and A_BTOR control of the 6633HDR from between the Electrocode unit and HD polar adapter to between the HD polar adapter and the positive control of the 6633HDR. Operational tests were made and the signals were returned to service the evening of July 17.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
210	7/18/1998	UP	CTC		ACS	UP 9507	75 Code Transmitter	Rawlins, WY	N	
			Failed Equipment or Device - Relay							
			On July 18, 1998 at 07:309 CDST, on the Laramie Subdivision at Rawlins, WY, westbound ZAPLA-16 observed the westbound CP-W680 was Yellow with a Green CAB, and westbound CP-W681 was Red with a Red over Yellow CAB. The ZAPLA-16 was following another train.							
			An investigation revealed that the eastward 75 Code Transmitter Relay at CP-W681 was coding faster than 75 because of a bad contact, which caused the eastward cab code at CP-W680 to upgrade the code to a Green (180 code rate).							
			The 75 Code Transmitter Relay was replaced, the signal system was restored to proper operation, and all applicable tests were performed.							
442	7/20/1998	CSXT	CTC			Q59221	RCRE Cable	NE Lilly, Lilly, GA	N	
			Failed Equipment or Device - Electrical Ground (not in underground or aerial cable)							
			On July 20, train Q59221 reported observing a CLEAR signal on the main and a MEDIUM CLEAR on the dwarf signal at the north end of Lilly. The signals were removed from service and signal personnel were dispatched. Upon arrival, signal personnel found the train on the OS circuit. The signal on the main displayed STOP while the dwarf signal displayed a MEDIUM CLEAR.							
			Investigation revealed that the RCRE cable had been pinched in the door to the dwarf signal the last time the signal was closed. The signal went to STOP when the door was opened and the cable moved. The RCRE cable was repaired and the flex wires inside the dwarf signal were replaced.							
			The signals were returned to service after performing operational tests, megging cables and checking for grounds.							
185	7/27/1998	BNSF	AB			MDENGAL3 - Engin	Pole Line Wire	Ottumwa, Iowa	N	
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)							
			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.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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186	7/30/1998	BNSF	CTC			ZNBYWSP829	Switch CP 7816	Vaughn, New Mexico	N
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Human Error - Signal Personnel Introduced False Energy into Signal System During Testing

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.

443	7/31/1998	CSXT	CTC			Q22929	None	East Junction, Hamlet, NC	N
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Vandalism - Instrument Case, Cable, or Junction Box Damaged

At approximately 0130 on the morning of July 31, Q22929 reported the distant signal to East Junction at CLEAR with no signal requested at East Junction. The signals were removed from service and signal personnel dispatched to investigate.

Signal personnel arrived at approximately 0200 and verified the CLEAR signal at the distant signal. The investigation revealed that the signal case at East Junction was hit by a vehicle. Upon opening the signal case at East Junction, signal personnel found the DR relay on its side. The contacts on the relay were made, thereby causing the false signal.

The relay was righted, operational tests performed, and the signals were placed back in service at 0300.

Signal maintainer verified that bungalow was struck by City vehicle. CSX police spoke to City personnel [GVH].

605	8/5/1998	AMTK		Remote		941	Signal 971-3, Charles Interlocking, Signal	Baltimore, MD	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

Engineer on train 105 reported that signal 7SB displayed STOP, due to #89 switch out of correspondence. Dispatcher gave the engineer permission by the 7SB signal with Rule 241. The engineer reported that after passing 7SB signal the cab signal aspect indicated CLEAR. Signal 971-3 displayed STOP AND PROCEED with CLEAR cab aspect displayed in engine. After investigation, it was determined that the 3 HGR did not check the cab signal network, therefore, allowing CLEAR cab rather than RESTRICTING cab to be displayed. Circuit changes made, circuitry 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?
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197	8/5/1998	NS	CTC			3537	Poleline	Leipsic, OH	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

At approximately 11:10 PM, eastbound train No. X10 reported receiving an ADVANCE APPROACH indication at intermediate signal 3156 and then a STOP at Leipsic home signal, MP B-311.4, which is the I&O interlocking. The engineer was able to stop short of the home signal at Leipsic. They had been running at restricted speed due to a storm caused code line outage. Signal 3156 should have been displaying APPROACH since it was an automatic signal. The home signal was at STOP because of the code line outage.

Signal personnel called to investigate were able to duplicate the problem and determined that the B3156HR relay that controlled the bottom yellow aspect was falsely energized with 6 volts across the coil. The 6 volts was found to be coming from a combination of several line wire wraps and grounds that resulted from damage from a severe storm which was passing through the area at the time. The voltage ultimately came from the 3156NHD line wire that was normally separated from the B3156H wire by no fewer than two wires fed by different battery. It was only through such an unlikely combination of poleline faults that this problem could have occurred.

The bottom yellow on the 3156 signal has been disabled until the poleline gets configured to prevent a recurrence. Other signal aspects were returned to service by 8:00 AM following poleline repair and appropriate tests.

211	8/7/1998	UP	CTC			UP00159	None	North Riverside, MO	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

On August 7, 1998 at 13:30 CDST, on the De Soto Subdivision at North Riverside, Missouri, southbound LSE57-07, at Mile Pole 26.30, observed a CLEAR southbound signal at CPD026, and a Red southbound signal at CPD027.

An investigation revealed that a line wrap in the HD circuits between D026 and D027 allowed the 61H and 61D relays to pick up falsely at D026.

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

212	8/7/1998	UP	CTC	Manual		UP-0508	None	Kinder, LA	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On August 7, 1998 at 22:45 CDST, on the Beaumont Subdivision at Kinder, LA, westbound MLIBT-07, at Mile Pole 545.3, observed a Yellow westbound signal governing the Interlocker at Kinder with the gate lined against movement on the Beaumont Sub.

An investigation revealed a wiring error which caused the gate repeater to be ineffective in the signal circuits.

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

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
187	8/25/1998	BNSF	AB			SCLOLCB-524 We	Pole Line	Adamana, AZ	N	
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)							
			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.							
214	8/27/1998	UP	CTC			SP 8108	None	Georgetown, LA	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			On August 27, 1998 at 14:40 CDST, on the Monroe Subdivision at Georgetown, LA, northbound MDYNL-26 observed the northbound signal at Control Point A560 upgrade from Red to Green with OS track circuit occupied.							
			An investigation revealed the relay track connections on either side of one insulated joint at the north end of the OS were transposed, which allowed the track battery from the north to be in series with both relays and energize the relays with the OS track occupied.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
213	8/27/1998	UP	CTC			UP 8266	None	Midvale, UT	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			On August 27, 1998 at 15:46 MDST, on the Provo Subdivision at Midvale, Utah, westbound 1 RUT611 27, at Mile Pole 26.30, had a switch lined under him while he was occupying the OS circuit.							
			An investigation revealed that an OS track relay was not wired into the OS track repeater, which allowed the switch to be lined while the train occupied a portion of the OS circuit for that switch.							
			The signal system was restored to proper operation, and all applicable tests were performed.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
215	8/28/1998	UP	CTC			SP 8267	None	Delta, CA	N	
			Vandalism - Instrument Case, Cable, or Junction Box Damaged							
			On August 28, 1998 at 22:30 PDST, on the Valley Subdivision at Delta, CA, westbound MBROA-28, on the main track at Mile Pole 296.25, observed the westbound signal out of the siding display a Yellow signal with the switch lined normal.							
			An investigation revealed vandalism in the control house left the LBHPR relay turned over.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
216	9/10/1998	UP	AB			UP 5555	None	El Paso, TX	N	
			Phantom Signal - Due to Sun Angle							
			On September 10, 1998 at 17:55 MDT, on the Valentine Subdivision at El Paso, TX, eastbound UP 5555 was lined from the House Track to the #2 Main Track at Mile Pole 826.5, and observed the eastbound signal was Green over Red with the #3 crossover lined against them.							
			An investigation revealed the signal appeared to give a Green indication due to the reflection of the sun on the lens.							
			A Phantom Screen was installed on the signal, and all applicable tests were performed.							

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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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198	9/29/1998	NS	AB			UP-9247, NS-8736	Connection	Millard, MS	N
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Failed Equipment or Device - Electrocode Module

At approximately 5:45 PM, train No. 131 was traveling southbound from Meridian, MS to New Orleans when the crew observed a CLEAR indication on signal 134.3. The crew knew they should have had an APPROACH indication because southbound train No. M30 was stopped in the second block ahead. They were aware of M30's location on account of radio conversation.

Signal personnel were called to investigate. The signals in this territory are controlled by Electrocode II electronic track circuits. Though the problem was not duplicated in the field, they did witness a more restrictive indication on the 134.3 signal under similar conditions. The code generator responsible for the 134.3 signal indication (at the next signal south) was found to be causing the false restricting when it was purposely vibrated in its socket. This code generator was never seen to cause a false clear in the field, even when vibrated. However, when the unit was bench tested at Birmingham with a code-two (APPROACH) continuously generated, it was able to get a receiver to decode a code-four (CLEAR) for about 9.5 seconds by wiggling the card. The unit was returned to the manufacturer for further analysis and their recommendations.

The manufacturer stated they were able to duplicate the problem and traced it to mechanical loosening of the connection at one end of a capacitor. This fault was found to only upgrade an APPROACH code to a CLEAR code or down grade to RESTRICTING, and then only sporatically and momentarily when the card was being vibrated. It would not upgrade from a red. It was not determined what could have been vibrating the case where the card unit was housed. Recommendations are to be provided by the manufacturer.

444	10/1/1998	CSXT	CTC			X90129	None	Republic, OH	N
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Human Error - Improper Circuit Jumper in Place

Train K90129 was traveling westbound on number one track near Republic, OH on October 1, 1998. The train crew received a CLEAR signal at the intermediate approach signal for Republic. After stopping and receiving permission to pass through a work authority, the crew observed a CLEAR signal with the WAS on number one track at Republic. The crew observed the number 15 crossover switch from number one to number two track reversed and braked the train. The train crew reported the incident to the dispatcher and the signals were removed from service.

Signal personnel were dispatched to investigate and observed the number 15 switch on number one track to be locked reverse and the number 15A switch on number two track to be locked in the normal position. Further investigation revealed that two jumpers installed at the factory had not been removed from the switch machine in accordance with the circuit plans. The effect of the jumpers was to return a correspondence indication of only the number 15A switch to the vital microprocessor unit. The shunt bar for the switch was also in the non-shunting position. The jumpers were removed and the shunt bar changed to the shunting position. The signals were returned to service after operational tests were performed.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
445	10/9/1998	CSXT	CTC			Q44009	None	NE Cherry, Plant City, FL	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			On October 9, CSX train Q44009 was traveling northbound on the main line of the Lakeland Subdivision approaching NAS Cherry. The train crew observed Green aspect on the main line NAS and a Red over Green aspect on the siding NAS. The signals were removed from service and train control personnel dispatched.							
			Train control personnel responded and verified the aspects viewed by the train crew. After investigation, it was determined the root cause of the false clear was caused by wire changes made recently in conjunction with replacing the searchlight with a color light signal. The operational tests were not performed correctly after the wiring changes were completed. The RAHDGR contact in the circuit the the NAS main line had been replaced with a contact from the RHDPR. The effect of this change was to remove the checks on switch position, detector circuit, and opposing routes when lining a signal. Therefore, both signals were lit when a northbound signal was requested. The wiring was corrected and the signals were returned to service after operational tests were completed.							
606	10/12/1998	AMTK	CTC			316	Signal 884-1 CS 89.2	Guilford, CT	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			Engineer on train 12 reported signal 884-1 displayed CLEAR aspect and CLEAR cab instead of cab speed. Also, CS 89.2 displayed CLEAR cab instead of cab speed with signal 1E at Guilford displaying cab speed. Upon investigation it was determined that peripheral boards of Micro Lok Plus for track #1 and track #2 at Loc. A at Guilford Interlocking were swapped which allowed wrong code to be sent to signal 884-1 and CS 89.2. Investigation is being conducted to determine responsibility.							
217	10/13/1998	UP	AB			Unknown	None	El Paso, TX	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			On October 13, 1998, at unknown time, on the Valentine Subdivision at El Paso, TX, an unknown westbound train on track #1 reported the westbound signal at MP 826.9 was Red over Green over Red with the next westbound signal Red over Red.							
			An investigation revealed the wires on the #3 and #4 contacts of the 2RBHDR relay were transposed.							
			The signal system was restored to proper operation, and all applicable tests were performed.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
189	10/19/1998	BNSF	CTC			BN 7908, HPASFT	GRS SA Mechanism	Spokane, WA	Y	
			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.							
218	10/21/1998	UP	AB			UP 6046	None	Pastura, NM	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			On October 21, 1998 at 23:45 MDT, on the Carrizozo Subdivision at Pastura, NM, eastbound ILLADU-20 was lined from the Main track to the siding, and eastbound approach signal at MP 1543.0 and the eastbound home signal for the switch at MP 1545.8 displayed a Green signal.							
			An investigation revealed the switch was not wired correctly which allowed the normal switch position indication to remain energized with the switch reverse.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
607	10/22/1998	CR		Remote		Train XSM49E	4TPR Relay	Pittsburgh, PA	Y	
			Human Error - Improper Circuit Jumper in Place							
			Train XSM49E was proceeding on signal indication through CP Penn from #1 track on the Conemaugh Line to #2 Island Connecting track over #9 switch reverse. The west end of the 41st car proceeded down #2 Island Connecting track while the east end of the car traveled down the Fort Wayne Line #2 track. The train went into emergency with the one car derailed. The cause of the derailment was determined to be jumpers that had been applied to the 4TPR relay allowing the #9 switch to be thrown with a train on that circuit. The jumper was removed, circuits tested and returned to service the same day. An investigation will be held to assess any employee responsibility, and instruction on company policy concerning jumper permission will be reviewed with all C&S employees.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
608	10/30/1998	METX		Manual			38RAHDR	Tower A-2, Chicago, IL	N
							Failed Equipment or Device - Relay		
							Train took signal 38R after past insulated joints in plant signal stayed Yellow. Mtr. Took track 2 out of service and started to trouble shoot. Found relay 38RAHDR not dropping with no battery on it. Replace relay, tested system and put back in service.		
							Time out: 11:30 AM Back in Service: 2:30 PM		
199	11/4/1998	NS	CTC			8929-6659	Human Error	Bandy, VA	N
							Human Error - Field Wiring Error, Inadequate Service Testing		
							At approximately 6:00 AM, train J69, a single unit helper, had traveled westbound on the Dry Fork Branch to the west end of Bandy, where he was to clear up in the siding. After lining himself into the siding and getting in the clear, the Engineer was in the process of tying his unit down when he heard the following train J60 call a CLEAR signal westward at the east end of Bandy. Since the engineer had not yet lined the handthrow mainline switch and derail back to normal, he reported the occurrence as a false proceed.		
							Signal personnel were called to investigate and were able to duplicate the problem. The normal switch detection relay for the handthrow switch is located at an ElectroLock cut section case about 700 feet west of the switch. Though this relay was properly down when the west end of Bandy switch was not normal, it was not affecting the electronic track code passing through the ElectroLock equipment. Investigation revealed that a handthrow switch adjacent to the ElectroLock had been removed from the track two days following the FRA 236.103 testing. When modifications were made for this removal, the maintainer erroneously cut out the circuit through the WP relay, too. Improper testing after disarrangement resulted in the wiring error going undetected at the time.		
							Corrections were made to the circuits, the signal system was properly tested and returned to normal service.		
609	11/11/1998	IC	CTC			GCG2CH	NBH Sig.	South Edgewood, IL	N
							Human Error - Signal Circuit Design Error, Inadequate Service-Testing		
							Crew of train observed NBH at CP South Edgewood display Yellow over Green in approach to the home signal at Edgewood Jct. displaying Red over Red.		
							Investigation found the Light Out Relay was de-energized for the top Red marker at Edgewood Jct. With the LOR down, the lower aspect was set Red; however, the outgoing code to the approach signal was not downgraded and continued to send a code for Yellow over Green.		
							Interim circuits were made by disabling the codes for the approach aspects when the LOR is de-energized. When the interim circuit changes were completed, tests were performed and signals observed to insure integrity. Permanent changes require programming and circuit changes, and these changes are being installed.		

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
190	11/17/1998	BNSF	CTC			UPSACD, Engine #	70 L Signal	Kansas City, MO	N
							Human Error - Field Wiring Error, Inadequate Service Testing		
							The UPSACD was a northbound train approaching the 70L signal at Tower 8, Sheffield, on the KCS Railroad. The train reported that the 70L displayed a Red over Green aspect with the next signal, 66L, displaying a Red aspect. Signals were tested and found to be as reported. The cause was due to a wiring error in the signal control circuit. Circuit was corrected and signals tested and restored to service on 11-18-98 at 0200 hours.		
610	11/20/1998	AMTK				MARC #532, Eng. 4	3N Signal, Charles	Baltimore, MD	N
							Human Error - Signal Circuit Design Error, Inadequate Service-Testing		
							Engineer on northbound MARC local reported that signal 3W at Charles displayed MEDIUM APPROACH with cab signal displaying APPROACH MEDIUM rather than APPROACH. Upon investigation it was found that due to a circuit design error, the speed selection network was omitted thru the new switch #66. Circuit was revised by breaking the speed selection network thru the #66 correspondence relays. Circuit was tested and 3N signal returned to service.		
219	11/28/1998	UP		Automatic		SP 6866	None	West Point, TX	N
							Maintenance - Wiring Chewed by Rodents		
							On November 28, 1998 at 14:08 CST, on the Smithville Subdivision at West Point, TX, southbound RDTPA-27 reported the southbound Interlocking Home Signal at mile pole 78.00 displayed a Red over lunar aspect with a westbound train occupying the interlocking.		
							An investigation revealed a rodent had chewed through the wire insulation in the signal mast which resulted in shorting the voltage from the red signal head wiring to the lunar signal head wiring.		
							The signal system was restored to proper operation, and all applicable tests were performed.		
611	12/3/1998	CR	CTC			6664	Auto. Sig. 1421W	Columbus, OH	N
							Human Error - Signal Circuit Design Error, Inadequate Service-Testing		
							Train PICO2, westbound, #1 track on Cincinnati Line observed signal 1421W CLEAR with westbound home signal at CP 144 displaying MEDIUM APPROACH. Cause was found to be field Signal personnel had made unauthorized circuit change and had failed to properly test the signal system.		
							Circuit design was corrected, all tests were made and the signal system was restored to service. Involved employees were removed from service and discipline was assessed.		

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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200	12/4/1998	NS	AB			9003	Poleline	Foristell, MO	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

At approximately 12:10 AM, train #256 with crew consisting of Engineer, Student Engineer, and Conductor were eastbound at West End Foristell when they observed the eastward signal go from RESTRICTING to CLEAR. The next signal, at East End Foristell, was then observed to be displaying APPROACH. The preceding train, #282, was in the block ahead of East End Foristell and, hearing #256 call these signals over the radio, contacted #256 to confirm the calls. Train #256 then aware that the signals had malfunctioned, slowed in sufficient time to avoid #282 and reported the problem to the Berkeley Operator.

Signal personnel were advised of the situation, investigated and were able to duplicate the problem. The cause was traced to a line wire wrap at about milepost S-50. A three wire DC HD line wire signal control system is employed in this territory. The wrap was between the opposing signal HD wires and did not involve the common. The condition resulted in a more restricting signal for the first train, #282, but when that train occupied the second of two track circuits in the block, a path was set up by the wrap that gave a false APPROACH aspect on the East End Foristell eastward signal into the block that [unintelligible] was what #256 had observed.

The wrap was cleared and the signals were tested for normal operation. Though not confirmed, it is likely that brush clearing activities the previous day had caused the wrap.

612	12/12/1998	CR		Remote		OIPI-1	14W Signal, CP UN	Gallitzin, PA	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

Westbound crew on OIPI-1 observed home signal 14W at CP "UN" displaying MEDIUM CLEAR with train RR 261 ahead in the block. Cause was found to be a design error which allowed the 14 WADR to be energized with a train in the block.

Design revisions were issued, all signal tests were completed and the signal system was returned to service.

446	12/14/1998	CSXT	CTC				None	NE Parkwood, Parkwood, AL	N
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Human Error - Field Wiring Error, Inadequate Service Testing

A southbound train observed a CLEAR signal at the SAS NE Parkwood. The switch at the SE Parkwood was lined normal and the next switch to the south was lined reverse for a movement onto the Lineville Subdivision. The signal at ME Parkwood should have displayed an APPROACH MEDIUM aspect for this movement. The signals were removed from service and signal personnel were dispatched.

Signal personnel verified the false proceed indication and identified two wires that had been reversed during a splice to repair a cut cable. The wiring error resulted in a false track code to be sent north to the SAS NE Parkwood. The splice was rewired correctly and the signals were returned to service following operational tests.

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

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

[Statement by Signal Supervisor]

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

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

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

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

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

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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615	5/4/1999	CR		Remote		6664	2E Signal	CP Alum, Blairsville, PA	N
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Failed Equipment or Device - Insulated Joint(s)

Engineer on eastbound PICA4 reported receiving APPROACH MEDIUM cab signal aspect with home signal 2E at STOP ahead. Problem was found to be 2 bad insulated joints at home signal 2E, which caused the DC track circuit in the interlocking to drop but did not shut off the MEDIUM APPROACH cab which was the proper cab for the route lined.

616	6/9/1999	FEC		Manual		420	1NDR Relay	Pompano, Florida	N
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Failed Equipment or Device - Relay

On June 9, 1999 at approximately 8:43 PM FEC train 21609 engine 420 reported signal 1N displayed a Red over Green aspect DIVERGING ROUTE CLEAR at Pompano North Interlocking with train 9809 occupying the block in advance. Signal 1N should have displayed Red over Red STOP under these conditions. Both trains were stacked in Pompano siding and train 21609 was following train 9809 in a northward direction after meeting southbound train 10509. The cab signal on train 21609 went to single Red and remained at this condition immediately after entering the OS track and no incidents occurred as a result of the wayside signal failure. After arrival at the scene FEC personnel were able to simulate the conditions and duplicate the failure.

The cause of the failure was determined to be the 1ND relay that was observed mechanically stuck in the energized position by FEC signal personnel. Contacts of the 1ND relay operate the clear control on the searchlight mechanism for the 1N signal that caused the B head of the 1N signal to display a Green aspect. The relay was removed from service and replaced in kind. Operational tests were made and the signals restored back to service.

The 1ND relay is a Type B plug in relay serial number H76-96N, Drawing Number 56001-925 manufactured in 1976 by General Railway Signal Co. Rochester NY. The relay will be sent to the manufacturer for inspection by an independent lab to determine the cause of the failure. Test results are forthcoming.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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617	7/8/1999	IMRL	CTC			IMRL 8925	RHDR Circuit	Deer Creek, IA	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On July 8, 1999 at approximately 13:53 hours, crew on eastward train M 232D 08 reported passing the eastward absolute signal at West Deer Creek displaying a CLEAR aspect when the next signal in advance at East Deer Creek was displaying a STOP aspect. At this time the power operated switch was lined reverse with a signal lined eastward out of the siding at East Deer Creek. The proper aspect for the eastward absolute signal at West Deer Creek at this time was APPROACH.

Signal Department personnel were immediately notified and arrived on the scene to promptly investigate this incident. Personnel duplicated the conditions that were reported at the time this incident occurred and determined this condition did occur as reported. With an eastward absolute signal lined out of the siding at East Deer Creek and an eastward signal lined down the main track at West Deer Creek, the eastward absolute signal at West Deer Creek would improperly display a CLEAR aspect.

This condition was caused by a circuit design error involving the RHDPR circuit at East Deer Creek which pole changes normal energy on the RHD line circuits. The RHDPR relay was designed to be energized when the RA or RB signal was lined at East Deer Creek. Corrections were made in the RHDPR circuit by checking the front contacts of the RAHR and NWPR relays before the RHDPR relay would be energized. Circuit changes were made and tests were completed at 0200 hours on July 9, 1999.

Signal Department personnel have determined that this condition has existed since 1979 when the CTC control points at Deer Creek were installed. Signal Department personnel have also checked all CTC control points on IMRL and have determined this design error does not exist at any other signal locations.

618	7/22/1999	AMTK		Remote		Train #418, Eng. 49	Charles Int., Signal 2N	Baltimore, MD	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

Engineer on train #418 reported that signal 2N at Charles Interlocking displayed APPROACH SLOW aspect with 4N signal at Paul displaying STOP aspect. Investigation revealed that a circuit design error existed in the 2NHRYPYR circuit. Revision of the circuit was accomplished by breaking the 2NHRYPYR circuit through the front contact of the 66RWCR. Circuitry was changed, tests completed and signal system returned to service.

619	8/25/1999	MNCR		Remote		Train #2736, Head	2S Signal	CP 26 - Phillipse Manor, NY	N
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Human Error - Improper Circuit Jumper in Place

Train #2736 received a NORMAL cab signal for a short period of time when the 2S signal at CP 26 was at STOP, due to a section of third rail laying on tie plates. This bridged an insulated joint at the signal, downgrading it to STOP as the train approached, while permitting cab signal intended for this train after passing the signal, to be received before passing the signal.

The section of third rail was removed from the insulated joint location.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
620	9/20/1999	CN		Automatic		N/A	Home Signal	Waltonville, Illinois	N
<p>Cause</p> <p>Phantom Signal - Due to Sun Angle</p> <p>Phantom signal created by sunlight on Green aspect of CN/IC home signal. Red lamp also burned out. Installation of snow shields and improving site distance for correction.</p>									
621	9/24/1999	AMTK		Remote		Commuter Rail Trai	Loop Interlocking - 14E	Boston, MA	N
<p>Cause</p> <p>Human Error - Signal Circuit Design Error, Inadequate Service-Testing</p> <p>Commuter Rail Road Foreman reported to ADE C&S Commuter the 14E signal at Loop Interlocking displayed an APPROACH MEDIUM into a SLOW APPROACH at the 14E at Broad Interlocking. Investigation revealed that a circuit design error from a field change that occurred on March 5, 1999 was the result of improperly displayed aspect on 14E at Loop. Circuitry was changed, tests completed and signal system returned to service. Investigation being conducted to determine responsibility.</p>									
622	10/5/1999	MNCR			ACS	Car # 8326	On-Board Cab Signal	Grand Central Terminal, New York, NY	N
<p>Cause</p> <p>Foreign Current Induced in Track Circuit from Adjacent Power Lines</p> <p>The on-board cab of car # 8326 randomly generated aspects more favorable than intended when operating on uncoded 100 Hz track circuits due to electrical interference by the Motor/Alternator of the car.</p>									
624	10/22/1999	CC	APB				FP	Sioux City, Iowa	N
<p>Cause</p> <p>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</p> <p>Yard employee reported westward signal at MP 507.4 was CLEAR with a cut of cars observed 20 car lengths west of signal.</p> <p>Failure was caused by a metal crossarm brace that had fell across the WBH and Com line wires energizing the WBH relay causing the westward signal to display a CLEAR indication.</p> <p>Corrective Action: The crossarm brace was removed from the pole line wires.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
623	10/22/1999	CR		Remote		Unknown	2E Signal	CP Jersey, Delair, NJ	N
<p>Cause</p> <p>Narrative</p> <p>Human Error - Field Wiring Error, Inadequate Service Testing</p> <p>On October 22, 1999, Conrail's Director-Operating Rules notified [redacted], Asst. Chief Engineer - C&S that a B. of L.E. Local Chairman informed him that 2E signal at CP Jersey was displaying a SLOW CLEAR when it had previously displayed a SLOW APPROACH going from CP Jersey to CP Hatch. The cause of the problem was the 2RE and 2R2E wires for the 0 and 1 lights were reversed causing the PL4 signal to display a SLOW CLEAR when it should have been displaying a SLOW APPROACH. The signal was rewired and tested and returned to service on October 22, 1999.</p> <p>An investigation will be held to ascertain employee responsibility. Further, instruction on company policy regarding circuit changes and testing will be reviewed with all C&S employees.</p>									
221	1/3/2000	BNSF	CTC			Amtrak 1006	3E Signal, Congress Park Control Point	Brookfield, IL	N
<p>Human Error - Train Crew Took Wrong Signal</p> <p>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.</p>									
268	1/8/2000	UP	CTC			UP5869	None	Odem, TX	N
<p>Human Error - Field Wiring Error, Inadequate Service Testing</p> <p>On January 8, 2000, at 06:10 CST at Odem, Texas, on the Brownsville Subdivision at MP 156.40, northbound MBVHO/07, on the main track, reported a CLEAR northbound approach signal at J156, into a Red over Lunar northbound home signal at J159.</p> <p>An investigation revealed a wiring error on the Electrocode unit at J156.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</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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269	1/11/2000	UP	CTC			AMTK-53	None	Bond, CO	N
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Cause

Narrative

Phantom Signal - Due to Sun Angle

On January 11, 2000 at 14:13 MST, in Bond, CO on the Glenwood Springs Subdivision at MP 156.00, eastbound Amtrak 53 on the main track lined for the siding, reported the eastbound signal was Red over Yellow into the siding with the switch reversed into track and time.

An investigation revealed a phantom signal in the bottom head caused it to appear Yellow.

The lens was changed in the bottom head, it was refocused, and the background was painted flat black. The signal system was restored to proper operation, and all applicable tests were performed.

222	1/25/2000	BNSF	CTC			Local	Signal 76L	Ft. Scott, KS	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

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.

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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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625	1/30/2000	WC				COKEX	Signal 2WA Color Light	Lake Villa West, Lake Villa, Illinois	N
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Cause

Narrative

Phantom Signal - Due to Foreign Light Source

Train COKEX observed a Yellow over Red aspect on signal 2WA for 10 seconds during a meet with train T048 while opposing signal 2EB was CLEAR.

Simulations and tests resulted in no defects.

A yard light for Snyder Trucking may have caused a phantom signal.

237	2/4/2000	CSXT		Automatic		Q13501	None	Columbia Ave., Hammond, IN	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On February 4, 2000, Q33501 reported to the dispatcher that he had received a MEDIUM APPROACH indication at the WAS #1 Track at Columbia Avenue with train engine J701 in the block ahead. The signals were removed from service and Signal personnel were dispatched.

Signal personnel simulated the movement and verified the false proceed indication. The westbound signal on #1 track at Columbia Avenue upgraded from STOP to MEDIUM APPROACH when the west end of the eastbound crossover from #1 to #2 track was reversed. Further investigation revealed that a pair of Safetran Dual Wideband Shunts were improperly applied around both insulated joints between the track circuits on #1 track. The improperly applied shunts acted as a DC shunt, allowing battery from the adjacent track circuit to pick the track relay when the shunt & break circuit broke the track circuit battery feed.

The wiring error was corrected and the signals were returned to service following operational testing.

626	2/9/2000	CN		Remote			Signal Wires	Wellsboro, Ind.	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

At 05:30 on 2/9/00 a CN train approaching the interlocking at Wellsboro, Indiana, South Bend Subdivision MP 71.1 reported that westward home signal WB2w had a CLEAR aspect when the crew knew that the signal should have been APPROACH. The investigation of the signal system found that the root cause of the false proceed was intermittent foreign voltage on the "H" control wire. The foreign voltage was traced back to a short on the line. The wrapped wire was removed and all circuits tested.

Remedial Action: All control wires will be inspected monthly.

Note 1: Locomotive number unknown, train crew notified FRA.

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

238	2/13/2000	CSXT	CTC			Q57911	Searchlight Mechanism	South Orange Grove, Pascagoula, MI	N
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Vandalism - Signal Damaged, Caused Unintended Signal Aspect

On February 12, 2000, at 2347 hours the Southward Absolute Signal from the siding at Orange Grove, Signal #6, went into time without a control. At 0012 hours on February 13, the dispatcher reported the signal hung in time and maintenance personnel were dispatched to investigate. At 0040, when southbound Q57911 occupied the siding, the dispatcher had the train crew report the signal aspect. Upon receiving the report that the signal was indicating Red over Yellow while the dispatcher had ordered it to stop, the dispatcher immediately removed the signal from service.

Upon arrival, Signal personnel verified the improper indication. Further investigation revealed that the searchlight signal mechanism had been vandalized. The outer compound lens had been broken, and pieces of the shattered lens were lodged in the signal mechanism causing the mechanism to be stuck in the Yellow position.

The signal mechanism was replaced, and the signal was placed back into service following operational testing.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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255	2/16/2000	NS	CTC			5469-5460	Phantom Signal	Cleveland, OH	N
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Cause

Narrative

Phantom Signal - Due to Sun Angle

At approximately 12:30 PM, Train No. 133 observed the 5WA signal at CP 190, Rockport Yard, displaying a SLOW APPROACH aspect. The dispatcher did not have the signal lined and the train was stopped as it took the signal. No other trains were involved.

Signal personnel arrived to investigate and first interviewed the train crew. The crew reported the signal they saw from about 150 feet had looked to be Yellow over Red. 5WA is a US&S dwarf signal consisting of four (4) light units each with an 18 watt bulb. The top unit is red, the second green, the third yellow and the fourth is a red unit. Initial inspection of the signal found it to be in excellent condition with no cracked or discolored lenses, no missing hoods. The signal was properly sealed, locked and aligned. The lighting voltage on the individual units, when lit, measured between 8.4 and 8.6 volts DC. The train was then backed to the point where the crew thought they saw the Yellow over Red. With the top and bottom red units lit, a STOP signal, the top red appeared to be washed out to the point that it could have been misinterpreted as a yellow. A contributing factor was the train crew's relative unfamiliarity with this location.

All appropriate signal tests were performed with no exceptions taken.

As the sun was above and slightly behind the 5WA signal, it was suspected that the sun reflecting back off the second hood could have caused the top unit, displaying red, to wash out somewhat. The signal bulbs were replaced with 20 watt bulbs, and the voltage was increased to 9.2 volts before returning the signal to service.

627	2/26/2000	CN	AB				Signal 366.7	near Baton Rouge, LA	N
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Failed Equipment or Device - Track Isolation Unit

The report of an alleged false proceed signal at Mile 366.7 was left on the Viocemail system of the Signal Supervisor, by a trainmaster, at 02:43 hrs (26.FEB.00). The Acting Signal Supervisor checked the voice mail at 17:20hrs. (26.FEB.00). This voice mail stated that with a train south of signal 366.7, said signal was flashing from Red to Yellow.

The appropriate signals were removed from service.

On site inspection and testing, formally commencing at 00:30hrs (27.FEB.00), could reproduce the condition as reported. A defective Track Code Isolation Unit allowed a capacitor to supply voltage to, and cause the momentary pickup of the 3667 HR, hence displaying the Yellow aspect with the track occupied.

The Isolation Unit was replaced. The signal system was tested and found to be operating properly. The signal system was restored to service at 02:30hrs (27.FEB.00).

As part of an on-going upgrade of the signal system on the Baton Rouge District, the Trackcode in this area is scheduled to be replaced with Electrocode, the week of 06.MAR.00.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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270	2/28/2000	UP	CTC			UP4808	None	Indio, CA	N
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Cause

Narrative

On February 28, 2000 at 10:22 PST, at Indio, CA on the Yuma Subdivision at MP 606.34, eastbound WBEBET-28 on the main track reported the eastbound signal at Myoma West displayed Yellow over Yellow aspect when lined for the siding.

An investigation revealed the lens in the top head was dirty, misaligned and the Red signal appeared Yellow.

The lens was changed and the signal head was refocused. The signal system was restored to proper operation, and all applicable tests were performed.

256	3/4/2000	NS	CTC			6681	Dwarf Signal	Norris Jct., AL	N
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Cause

Narrative

At approximately 2:50 p.m., Train No. 192A504 was leaving Norris Yard eastbound and called a DIVERGING CLEAR indication (R/G) at Home Signal 27L - Norris Jct., MP 790.7. The operator at Birmingham Division Control Center observed train 192 entering the plant at Norris Junction onto Main 1 and contacted the train crew to stop. The 27L signal was not requested and should have been displaying a STOP. Train 192 ran by signal approximately 1,250 ft.

Signal personnel investigated and took no exceptions of the signal system. Signal log reports at the Control Center and the field determined the 27L signal was not requested nor did it indicate lined.

Further tests determined that the color light dwarf signal was subject to reflection from sunlight depending on the viewing location and position of the sun.

Action was taken to replace the standard hood arrangement with 9 inch hoods that surround each colored lens and install phan screens to further direct sunlight reflection.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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257	3/9/2000	NS	AB			CR2898	Audio Frequency Overlay	Taylor, MI	N
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Cause
Narrative

At approximately 3:45 p.m., Train L60L59 was leaving Oakwood Jct. on the Detroit District, Lake Region on an APPROACH indication into single direction ABS territory. They were following train L64. As train L60 approached automatic signal D-10.2, they observed a CLEAR signal. Aware that train L64 was working ahead, they passed this signal prepared to stop.

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

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

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

258	3/10/2000	NS	CTC			8373, 8792, 8051	Light Out Circuit	Reading, PA	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

At approximately 5:30 AM on 3/10/00, train 11AH510 was proceeding west on Track #1 on the Harrisburg Line in Reading, PA. After having passed Intermediate Signal 591 displaying a CLEAR indication, the train encountered the next signal, Intermediate Signal 601 displaying a RESTRICTING indication.

The train was brought to a safe stop, and the problem was reported to the Harrisburg Dispatcher.

Investigation of the incident revealed a lamp failure on the Green aspect of Signal 601, and a design deficiency in the light out circuit at Signal 601. The signal design at this location would cause a Red aspect to be displayed when a lamp failure condition existed on the Green or Yellow aspect (as is proper), but failed to change the polarity feeding the approach signal, Signal 591. The result was Signal 591 displaying a CLEAR indication into a RESTRICTING indication at Signal 601 when a lamp failure condition was present on the Green or Yellow aspect at Signal 601.

After the incident, changes were made in the circuit design at Signal 601 such when a lamp failure occurs on the Green or Yellow aspects at Signal 601, in addition to causing Signal 601 to display RESTRICTING indication, a polarity change will be fed to Signal 591, causing it to display an APPROACH indication. Upon completion of these changes, the signal system was restored to normal service.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
628	3/27/2000	AMTK	AB			N/A	Hand Throw Switch MP 14.9	Norwood, MA	N
<p>Cause</p> <p>Human Error - Field Wiring Error, Inadequate Service Testing</p> <p>Maintenance inspector discovered that the hand throw switch at MP 14.9 was not checking the signal control circuits for 2E signal at Norwood Central and 131.2 signal. This was found during a routine maintenance inspection. It appears that due to a signal circuit revision at Railroad Ave. sometime in 1995 the signal control circuits were removed from checking the hand throw switch at MP 14.9. Circuits were revised, tested and signal system returned to service. Person responsible for circuit changes made in 1995 no longer is employed by Amtrak.</p>									
629	3/28/2000	CN		Manual			CL	E. Bridge Interlocking	N
<p>Cause</p> <p>Human Error - Signal Circuit Design Error, Inadequate Service-Testing</p> <p>Polarity of control wires for H2 mechanism (Signal 31) was reversed allowing said signal to display Green aspect in lieu of Yellow. (09:00, 28-Mar-00). Signal wires were restored and full operational tests were made (18:00, 29-Mar-00). Signal was found to have been wired according to circuit plans. Plan was in error and field corrections made. East Bridge Interlocking, New Orleans, LA.</p>									
239	4/11/2000	CSXT		Remote		H89611	None	E.E. Quinimont, Quinimont, WV	N
<p>Cause</p> <p>Human Error - Improper Circuit Jumper in Place</p> <p>At approximately 1515 hours on April 11, 2000, the crew of H89611 reported that they had received a MEDIUM CLEAR signal at MP 377 while proceeding eastbound out of the siding at E.E. Quinimont into a STOP signal at Backus MP 371. The signal should have displayed a MEDIUM APPROACH. Signal personnel were dispatched, verified the false proceed indication, and subsequently removed the signals from service.</p> <p>Further investigation revealed that the R270 DR relay was improperly energized by a wire which ran directly to the BH-6 battery buss, effectively removing the #1 reverse polar contact of the R268 HDR from the circuit. This permitted the R270 DR relay to be energized when the R270 signal was requested without checking the aspect displayed at Backus.</p> <p>The wiring error was corrected and signals were returned to service following operational testing.</p> <p>The cause was found to be improper operational testing following field wiring changes.</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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630	4/14/2000	IMRL	APB			IMRL 355	Stick Circuit	Kittredge, IL	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On April 14, 2000, Engineer on train M264D14 reported the eastbound signal at East Kittredge as displaying an APPROACH aspect with westbound train ICHLB14 occupying the same block east of Kittredge. The proper aspect for the eastbound signal at East Kittredge at this time was Red.

Signal Department personnel were notified and immediately investigated this incident. Signal Department duplicated this incident and found stick relays energized at MP 114.8. This condition prevented the opposing east bound signals to tumble back to Kittredge when train ICHLB14 passed Adeline.

Signal personnel released the stick circuits and performed the appropriate tests. Subsequent to tests, signal system was returned to operation at 22:52 hours on April 14, 2000.

240	4/21/2000	CSXT	CTC			Y16221	#27 Track Circuit	Baldwin, Baldwin, FL	N
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Human Error - Field Wiring Error, Inadequate Service Testing

At approximately 1558 hours on April 21, 2000, northbound single engine Y16221 passed the northbound signal at Baldwin on the main track. The engine had previously indicated occupancy on two separate track circuits at Baldwin, but then indicated clear of the Baldwin circuits upon passing the northbound signal. When the track circuits indicated clear, a previously stored request began automatically lining signals. The switch at Baldwin subsequently reversed and a southbound route lined through Baldwin while Y16221 still occupied the track. The signals were removed from service and Signal personnel were dispatched.

Further investigation revealed that the track circuit had been altered by Signal employees attempting to resolve a previous track circuit problem. The employees believed that the existing track wires were faulty, disconnected the existing track wires, and replaced them with temporary wire. In re-wiring the track circuit, the employees failed to recognize the track circuit as a series fouling circuit, and inadvertently eliminated a short portion of the main track from the circuit.

The wiring errors were corrected, and signals were returned to service following operational testing.

The cause was found to be improper operational testing following field wiring changes.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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241	4/23/2000	CSXT		Remote		N94820	#4 Signal	VR Tower, Walbridge, OH	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

At approximately 2315 hours on 4/23/2000 at VR Tower in Walbridge, OH, northbound train N94820 reported receiving a MEDIUM CLEAR (Red over Green) on the #4 Signal when lined for a crossover move from #1 track into the receiving yard through #7 and #5 crossovers reversed. The signal for this move should have been RESTRICTED (Red over Yellow). The following train, Q39723, made this same move and reported receiving a RESTRICTING signal. Upon notification, Train Control personnel were dispatched to investigate.

Further investigation revealed that when a signal was lined northbound on the #2 track at Yard D through the next northbound interlocking (#8 Signal), a Code 7 was sent back to VR Tower holding up the W2DR. This permitted a MEDIUM CLEAR signal to be displayed when the signal was lined on #2 track without checking the position of the #5 crossover.

The wiring error was corrected and signals were returned to service following operational testing.

The cause was found to be a design error.

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 ZWSPNBY9-24B, 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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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631	5/2/2000	IMRL	APB			UP 9730	None	Byron, Illinois	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

On May 2, 2000, Engineer on westbound train ICHLB 02 reported that while operating on Red signals and after passing eastbound signal 891 he looked toward the rear of his train and observed signal 891 displaying a CLEAR aspect. The Engineer reported that his train was occupying the block for signal 891 when the CLEAR aspect was observed. The proper aspect for signal 891, at this time, was Red.

Signal Department personnel were notified at 10:00 PM and immediately began a complete investigation of this incident. Personnel tested relays, meggered cables, and inspected signal light wires and the pole line. Attempts were also made to recreate this incident by shunting tracks and with actual train movements. Signal would not clear until shunts or train was completely by signal 891. Subsequent to tests, signal system was functioning as intended and returned to service at 04:40 AM on May 3, 2000. Signal Department personnel were unable to duplicate this alleged false proceed report.

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 System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
227	5/6/2000	BNSF	CTC			Z-WSPSBD-104	Westbound Signal Main Track Two	Barstow, CA	N	
			Phantom Signal - Due to Sun Angle							
			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.							
			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.							
			Correction: Added hood over red aspect to reduce the potential of sun interference.							
242	5/11/2000	CSXT	CTC			IHB Run 518	Design	CP Francisco, Blue Island, IL	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			On Thursday, May 11, 2000 at approximately 1022 hours Indiana Harbor Belt (IHB) Train Run 518 received a RESTRICTING signal at CP Francisco MP DC 14.9 (IHB MP 15.4) to proceed west on Track 1. At the same time, eastbound IHB Train NP 11 accepted an opposing approach signal at CP 123 (IHB MP 17.5) to proceed east on Track 1. Each train proceeded into the block until they viewed the opposing train and stopped. The signals were removed from service and Train Control personnel were dispatched.							
			Further investigation revealed that the false proceed was caused when the Call-on feature was initiated by the dispatcher, which permitted a RESTRICTING signal to be displayed at CP Francisco with an opposing signal already lined into the block.							
			Temporary wiring changes were made to disable the Call-on circuit, and signals were returned to service following operational testing.							
			The cause was found to be a design error.							
632	5/15/2000	METX		Manual		Unknown	Signal 2-0	Chicago, IL	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			Signal 40R was reported Green and signal at 2-0 was reported Red. Found wires on RSRIT on print A1-2-1A contact #16 and 13 reversed. Repaired same signal 5/15/00 2:50 PM.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
633	5/23/2000	PATH	AB				Signal 232	Tunnel E, Exchange Place, Jersey City, NJ	N
<p>Cause</p> <p>Narrative</p> <p>Human Error - Field Wiring Error, Inadequate Service Testing</p> <p>At some undetermined time in the past, automatic signal 232Z was improperly wired in the field to display a speed control aspect (Rule 208, Figure 1 - Yellow over Yellow), when it was designed to display an APPROACH aspect (Rule 211, Figure 1 - Yellow). Due to track alignment and entering a station platform, this is a slow speed location, and no unsafe conditions or incidents have occurred over the period of years that this has been in place. The wiring has been corrected and the signal displays the proper aspects as designed.</p>									
228	5/30/2000	BNSF	CTC			ZNBYWSP2-28A,	None	Courtney, MO	N
<p>Loss of Shunt - Possible Rust or Foreign Material on Rail</p> <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>									
271	5/31/2000	UP	CTC			SP 2710	None	Houston, TX	N
<p>Human Error - Field Wiring Error, Inadequate Service Testing</p> <p>On May 31, 2000, at 11:30 CDT, at Houston, TX on the Terminal Subdivision at MP 2.8, eastbound YHS52-31 on #2 main was lined through the 121 x-over, and reported the eastbound signal 19B at the #23 switch displayed a Red over Green.</p> <p>An investigation revealed the HD control wires to eastbound signal 19B were reversed.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</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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259	6/2/2000	NS	CTC			AMT 57, AMT 37	Design Error	Elyria, OH	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

At 4:45 a.m., June 2, 2000, Amtrak #29 was traveling west on track #2 at MP 203 on the Chicago Line when they received a STOP signal at CP-203. After receiving permission to pass the STOP signal, they progressed to intermediate signal 205 2W which was displaying a LIMITED CLEAR (Red/Flashing Green). At this time they notified the dispatcher concerning the improperly displayed signal.

Investigation: The signals were lined to replicate the conditions experienced by Amtrak 29, The crossover at CP 207 was lined and it displayed a LIMITED CLEAR aspect. At signal 205 2W a LIMITED CLEAR aspect was also displayed. At this time the NWLPPR relay was also still de-energized. Signal 2W at CP-203 was displaying a STOP aspect. Under these conditions Signal 205 2W should display a STOP AND PROCEED aspect (Red/Red), but was displaying an improper aspect of LIMITED CLEAR (Red/Flashing Green).

Review of the in service circuit plans revealed that aspect displayed was consistent with the designed circuit. The circuit design allowed the "B" head to continue to display a Flashing Green with the hand throw switch showing not lined for normal movement. With the cross-over at CP 207 lined from track #2 to track #1 the signal that would be displayed at 205 2W if the NWLPPR relay was energized would be APPROACH LIMITED (Yellow/Flashing Green). When the NWLPPR relay was de-energized the "A" head went to Red but the "B" head remained at Flashing Green.

Correction: Signal engineering was contacted and they developed a circuit modification to correct the problem. The circuit was modified and complete signal checks were performed. The signals were placed back in service at approximately 2:00 p.m.

272	6/2/2000	UP	CTC			UP-3568	None	Houston, TX	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On June 2, 2000 at 18:00 CDT, at Houston, TX on the Terminal Subdivision at MP 366.30, westbound 1HHOKC 02 was lined from Main Track 2 to Main Track 1, and reported the westbound signal #15 on Track 2 at LF369 was Red over Flashing Yellow and the next westbound intermediate signal at MP 5.9 was at STOP.

An investigation revealed a design error. The Reverse Switch Relay was not wired into the "B" signal head of the westbound #15 signal.

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

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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274	6/3/2000	UP	CTC			UP-1647	None	Houston, TX	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On June 3, 2000 at 14:50 CDT, at Houston, TX on the Terminal Subdivision at MP 366.30, the Dispatcher was able to line a route from CP LF369, on the #1 main to Bellaire Junction, with a hand throw switch on the #1 main, located south of CP LF369 in a reverse position.

An investigation revealed a design error. The Switch Correspondence Relay was not wired into the control for the southbound signal at LF369.

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

260	6/4/2000	NS	CTC			NS 9316	Human Error	Bellwood, NJ	N
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Human Error - Field Wiring Error, Inadequate Service Testing

At approximately 5:00 p.m., June 4, 2000, train #I62H403 was eastbound on the Lehigh Line, in the controlled siding between CP 67 and CP 64, when they observed the eastbound signal at CP 64 on the single track displaying a CLEAR aspect with the #1 switch at CP 64 in reverse position lined against them.

Investigation revealed switch junction box had been damaged earlier in the day (at approx. 9:00 a.m.) by what appears to be All Terrain vehicles. Repairs were made by Maintainer and Maintainer Test. They gave the switch back to the dispatcher at 2:06 p.m. The investigation by Fye and Renninger revealed four conductors of the switch cable had been placed in the wrong position which resulted in the switch points laying in the reverse position, yet indicating it was in the normal position. Wiring corrections were made and a complete breakdown of the switch indication circuits were done along with verification of switch correspondence with the dispatcher. Indication locking tests were made and the interlocking was restored to service at 9:55 p.m.

The false proceed signal at CP 64 was due to both maintainers' failure to make proper in-service tests after disarrangement of the signal 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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634	6/6/2000	CN	AB			IC 1026	85 Signal	Cicero (Hawthorne), IL	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

At approximately 1100 hours on June 6, 2000, westbound train CHWL-06 reported that signal 85 displayed a Yellow aspect with the hand-throw switch lined reverse, within the block at Mile 8.8.

Signal 85 was removed from service by the Signal Supervisor. Upon arrival at the location, the investigation found that the location had not been vandalized or damaged and that the incident was reproducible.

On June 2, 2000 the hand-throw switch at Mile 8.8 had been placed in service. The crossover track circuits 1AXT and 2AXT had been inadvertently omitted from block repeater circuit 85BP, which allowed signal 85 to display an aspect less restrictive than intended when the crossover switch was lined reverse. The omission was not discovered during the in-service testing.

Corrections to the 85BP circuit were made to include the 1AXT and 2AXT in the block repeater circuit 85BP. The circuits were then tested to determine that they were operating as intended.

Signal 85 was returned to service at 1800 hours.

635	6/8/2000	AMTK		Manual		None Involved	64L Signal at 200 (DI)	Philadelphia, PA	N
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Failed Equipment or Device - Relay

Engineman on SEPTA train no. 562 reported that, while making a move on Track No. 1 at signal 54L, he looked over and observed signal 64L displaying a STOP AND PROCEED aspect. At no time did the operator at Zoo call for signal 64L to be cleared. Upon investigation, it was found that signal 64L was displaying a bottom marker light. Further investigation revealed that the bolt holding the No. 3 front contact of the 64LBHB relay had broken and the carbon contact inside of the relay slid down and allowed a continuous electrical path between the No. 3 front, heel, and back. This allowed EBX energy to be applied to the 64LBN2L circuit, thereby illuminating the 64L marker light. The relay was removed from service, a new relay installed, circuitry tested, and the signal system returned to service. Further testing with the vendor will take place to determine the cause of the bolt failure.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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273	6/12/2000	UP	CTC			UP-9709	Relay	Hood River, OR	N
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Failed Equipment or Device - Relay

On June 12, 2000 at 14:49 CDT, at Hood River, Oregon on the Portland Subdivision at MP 61.40, westbound IG2SE 10 had gone by a Green westbound signal at MP 61.50 and looked back to see the eastbound signal at MP 61.40 displaying a Yellow aspect.

An investigation revealed a broken armature pin in the 614 HR relay allowed the armature to twist allowing contact connection that false picked the HPR relay for the eastbound signal at MP 61.40, which caused the eastbound signal at MP 61.40 to display Yellow.

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

636	6/15/2000	PATH	AB				Auto Signal 90	Hoboken Station, Hoboken, NJ	N
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Human Error - Field Wiring Error, Inadequate Service Testing

A wiring change in the signal control circuit was improperly installed and tested as part of a timing relay replacement. This resulted in the improper display of an APPROACH aspect (Yellow, old Rule 211, Fig. 1, new Rule 213, Fig. 1) with no train on the approach circuit, instead of a STOP AND PROCEED (Red, old Rule 215, Fig. 1, new Rule 219, Fig. 1). Due to this being a stub-end terminal station, this is a slow speed location. No unsafe incidents occurred. The wiring was corrected, retested, and the signal displays the proper aspects as designed.

261	6/24/2000	NS	CTC			8933, 2506, 8713	Human Error	Dorset, OH	N
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Human Error - Field Wiring Error, Inadequate Service Testing

At approximately 2:22 a.m., June 24, 2000, train #62V was southbound at MP 10.5 on the Youngstown Line when they observed signal 10S displaying APPROACH LIMITED (Yellow over Flashing Green) with signal at CP 13 MEDIUM APPROACH (Red over Flashing Yellow). The train crew knew that MP 10.5 should have been displaying Yellow over solid Green since they were lined to take the turnout at CP 13. The number 15 turnout at CP 13 is limited to 30 MPH, therefore, the signal observed by the train crew at 10S, Yellow over Flashing Green, was improper since it was a 40 MPH speed limit through the turnout at CP 13.

Investigation determined that this improper signal was displayed due to our Signal Supervisor replacing the EC-4 box when it was in trouble on 6/1/00, at CP 13. He placed a control wire on the wrong terminal post of an EC-4 box which generated a Code 4 instead of a Code 3. He failed to make proper in-service tests after disarrangement of the signal system.

The wiring on the EC-4 box was corrected, in-service tests were done and the signal system placed back in service 6/24/00.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
637	6/26/2000	IMRL	CTC			IMRL 105	None	Ipsco, Iowa	N
			Scenario Reenacted, Unable to Duplicate, No Defects Found						
			<p>On June 26, 2000 at approximately 23:06 hours, crew on train L82726 reported observing eastward absolute signal 1E at Ipsco displaying a CLEAR aspect when lined into the pocket track with cars setout in the pocket track. The proper aspect for signal 1E at Ipsco at this time was Lunar.</p> <p>Signal Department personnel were immediately notified and arrived on the scene to promptly investigate this incident. Personnel duplicated the conditions as reported by lining signals and shunting tracks which resulted in signal 1E displaying a Lunar aspect as intended. Personnel then reviewed the VHLC data log which verified that signal 1E displayed a Lunar aspect for train L82726 which was the proper aspect. Signal Department personnel were unable to duplicate a CLEAR aspect as reported. Subsequent to tests, signal system was returned to service.</p>						
638	7/9/2000	CR		Manual		N/A	Proximity Detector	Bridgeport, NJ	N
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing						
			<p>On 7/19/00, the bridge operator at Bridgeport moveable bridge at MP 20.79 on the Pennsgrove Secondary notified the signal office that he was able to get a signal with one of the mitre rails not seated. Upon investigation by local C&S forces, we found a proximity switch that failed in the closed position.</p> <p>On 7/19/00, the signal forces removed the defective proximity detector and set the signals.</p> <p>On 7/20/00, the defective proximity detector was replaced after new circuitry was installed to insure that if a proximity detector did fail in the open position, it would be impossible to get a signal.</p> <p>[Note from Editor: This false proceed was charged to "Signal Circuit Design Error" because it is clear from the description above that the circuit was not originally designed on the "closed circuit" principle, as required by 49 CFR Part 236.5]</p>						
275	7/9/2000	UP	CTC			AMT 28	None	Madison, IL	N
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing						
			<p>On July 09, 2000 at 11:15 CDT, at Madison, Illinois on the Springfield Subdivision, northbound 1AMT22.08, on track #2, had a Yellow (APPROACH DIVERGING) northbound signal at CP GM278, with the northbound home signal at WR Tower, MP 275.60 displaying a Red over Yellow (RESTRICTING) indication.</p> <p>An investigation revealed differences in signal aspect rules between the TRRA and the UPRR resulted in a signal design error.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</p>						

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
639	7/11/2000	DH	CTC				Switch Circuit Controller	MP 29.5, Ballston Spa, NY	N	
			Maintenance - Switch Circuit Controller							
			<p>Train SCR traveled north thru CPC 24 to switch cars at Curtis Lumber, train 63 was to follow them north. The dispatcher cleared CPC 24 North after SCR. Train 263 called SCR to find out their location. SCR reported that they were switching in Curtis out the switch was open on the main. Train 263 had passed CRC 24 with a CLEAR signal and saw signal 28.7 was CLEAR and stopped their train. Maintainer Acker was notified at 18:45 and the switch circuit controller rod had fallen off at Curtis switch because switch points had moved north. Also found the spring loaded cam in circuit controller in closed position unable to move. Replaced controller and point rod. Had Track Dept. move switch timbers.</p>							
243	7/19/2000	CSXT	AB			Q138-19	EB Signal, #2 Track	Scott Haven, PA	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			<p>At approximately 1830 on 19 July, Q136-19 eastbound on #2 track reported a CLEAR signal with the crossover from #2 to #1 track lined against them. The eastbound signal on #2 track was removed from service.</p> <p>The false clear signal was found to be due to a wiring error. The B-12 wire was found to be connected to the heel contact of a relay in the 51B circuit instead of to the front contact. The wiring error bypassed a relay contact which should have opened the HD circuit when the switch was reversed and set the signal to red. With this contact bypassed, the switch could be reversed without knocking down the opposing signal.</p> <p>The wiring error was corrected, operational checks were performed, and the signals were restored to service at 2310.</p>							
640	7/20/2000	WC	AB			L017-20, WC 6620	Signal 2516	Stevens Point, Wisconsin	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			<p>As NB train L017 passed approach signal 2517, Engineer looked back and observed SB signal 2516 at APPROACH while the 52 car train was still on the circuit.</p> <p>No defects found. Unable to replicate after numerous simulations. Signal returned to service after testing complete.</p>							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
262	7/21/2000	NS	CTC			NS 7136	Pole Line	Milton, PA	N
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)						
			At 9:30 a.m., July 21, 2000, southbound train #H46 received a CLEAR signal, southbound at CP South Fair into a STOP AND PROCEED aspect at automatic signal 247S. Dispatcher notified of incident.						
			Investigation of this incident revealed three separate trouble areas. These three conditions were a grounded code line (L-) wire at MP 246.1, a grounded line drop at Cameron Street, Milton, PA on the negative EHD line wire, and a dead comm line wire that was making contact with both the positive EHD and code line (L+) wires at MP 246.6.						
			The above conditions caused false code line voltage to be applied to the HD resulting in a CLEAR aspect at CP South Fair into a STOP AND PROCEED at signal 247S. The dead comm wires were removed from both code line wires and the signal control wires and the grounded line drop cable has been replaced.						
641	7/24/2000	KCS	CTC			KCS 6602	Pt. Det. Rod	Beaumont, TX	N
			Human Error - Signal Equipment Improperly Installed						
			At 11:50 hrs on 07/24/00 train #016423 North with engines KCS 6202 and KCS 729 with Engineer and Conductor and a consist of 48 loads, 29 empties, 6633 tons and 4370 feet, was traveling north bound at Mile Post 766, Neches River Bridge, where he reported receiving a Yellow aspect with the derail in the derailling position. The signals were immediately removed from service with the Control Operator until investigation could be made. Upon arrival at the location myself, Signal Engineer [redacted], Signal Supervisor [redacted], and Signal Maintainer [redacted] investigated the report and was able to reproduce the reported failure. The first finding was that the point detector rod was broken where the threads (for connection to the external rod) and the shoulder of the external rod come together. The second finding was that the Lock Rod Arm (clips) were installed reverse therefore not insuring that the lock rod and point detector rods were moving concurrently as described in the General Railway Signal Pamphlet #1293 Rev. February 1987, page 45. The corrective action was to install the lock rod arm (clips) properly and replace the broken point detector rod. We have checked every affected switch machine on the KCS property to insure that this condition doesn't exist anywhere else.						
642	7/24/2000	SEPA	AB				Cable	Jenkintown, PA	N
			Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)						
			See attached [nothing attached].						

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
229	7/25/2000	BNSF	CTC			Train SLGBNYC6-2	None	Ormonde, IL (Chillicothe Sub)	N
			Scenario Reenacted, Unable to Duplicate, No Defects Found						
			<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>						
244	7/28/2000	CSXT	CTC			Q308-26	Signal 56N	Arlington, OH	N
			Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)						
			<p>On July 28, 2000 northbound Q308-26 received an APPROACH aspect at intermediate signal 56N while the electric lock switch XA54 at the New Generation Industry Spur was lined reverse against the 56N signal. Signal 56N should have displayed an aspect no better than STOP AND PROCEED with the switch reversed. Train H719-26 had lined the switch reverse in order to set off a car in the industry track, and the signal went from STOP AND PROCEED to APPROACH when H719-26 cleared the fouling section of switch XA54. When H719-26 re-entered the fouling section, Signal 56N went back to STOP AND PROCEED. The switch was removed from service and Train Control personnel dispatched.</p> <p>The cause was found to be shorted HD conductors in a spliced aerial 12-conductor/14 line drop, caused by moisture shorting out the wires. The line drop was replaced, switch and signal checks were made with no exceptions, and the signals were returned to service.</p> <p>The cause was determined to be a material failure of the splice.</p>						
230	8/2/2000	BNSF	CTC			GCCMTAC931	169.7	Culbertson, MT	N
			Human Error - Field Wiring Error, Inadequate Service Testing						
			<p>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.</p>						

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
245	8/2/2000	CSXT	AB			None	WB Int., Signal #43	Westport Branch, Baltimore, MD	N	
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)							
			On August 2, 2000, FRA officials observed westbound color light intermediate signal #43 displaying an APPROACH aspect (Yellow) with a local freight train in the block ahead. Signal 43 should have displayed a RESTRICTING aspect (Red). The signal was removed from service and Train Control personnel were dispatched.							
			The cause was found to be pole line wires which had been pulled down by a large tree that fell across the line wires. The insulation on the wires was damaged, and the bare HD wires were shorted together.							
			The pole and line wire were repaired, signal and switch checks were made with no exceptions, and the signals were returned to service. The cause was determined to be external damage from the tree to the pole line wire.							
643	8/7/2000	CN	AB			CN2540	Signal 1063	Mishawaka, IN	N	
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)							
			A tree had fallen on the pole line near Fir Rd. at milepost 105.8 on the Southbend Subdivision. The "H" wire and "D" wire crossed causing the signal to be falsely cleared. This was reported by CN 2540 at 0130 on August 7, 2000. The tree was removed, the line wire was repaired, and signal was tested and back in service on August 7, 2000 at 0600.							
246	8/8/2000	CSXT	CTC			P052-07	Signal 6L	Fredericksburg, VA	N	
			Failed Equipment or Device - Electrical Ground (not in underground or aerial cable)							
			On August 8, 2000 at approximately 0720, northbound L174 while moving on #3 track between Hamilton Interlocking and Fredericksburg Interlocking reported the Northbound Signal (6L) for #2 track at Fredericksburg displaying an APPROACH aspect with Train P308-08 ahead in the block. Signals were removed from service and Train Control personnel dispatched.							
			Investigation revealed a 4.4 mA ground which caused the 6LBPR relay to remain energized with the block occupied ahead. The cause of the ground was found to be deteriorated insulation on house wires which were contacting the metal wire chaseaway. All deteriorated house wires were replaced, signal checks were made with no exceptions, and the signals were returned to service.							

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
276	8/10/2000	UP	AB			UP6053	None	Mulford, CA	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			On August 10, 2000 at 00:50 PDT in Mufford, CA on the Coast Subdivision, southbound IOAMN 09, on the Main Track at MP 15.70, reported the northbound signal 15.70 displayed a Green aspect when they were 100 feet south of signal 15.70 and 1,900 feet of their train was north of the signal.							
			An investigation revealed that a field construction gang had extended some track circuits and had failed to break the control to northbound signal at MP 15.70 with the track contacts.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
644	8/16/2000	WC		Manual			2LA	Lake Villa, Illinois	N	
			Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)							
			Northbound #2 main displayed Red and Yellow aspects at the same time. Upon notification took plant out of service.							
			Upon investigation found bridge piling was driven through cable crossing the wires.							
			Replaced cables.							
645	8/17/2000	WC		Manual			103L	Vernon, Wisconsin	N	
			Vandalism - Signal Mechanism Shot - Stuck in Position							
			Northbound signal stayed CLEAR after train movement, received unsolicited signal indication on CTC screen.							
			Upon notification took plant out of service. Plant locked up as intended, caused by vandalism. Signal shot out, broken glass stuck in mechanism.							
			Replaced and tested SA type mechanism.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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247	8/20/2000	CSXT	AB			CP522	CP9 SB Sig., #2 Track	Tonawanda, NY	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

On August 20, 2000, the train crew on southbound CP 522 observed the southbound signal on #2 track at CP9 displaying an APPROACH MEDIUM aspect with a STOP aspect at the next signal at CP8. The signal at CP9 should have displayed an APPROACH aspect. The signal was removed from service and Train Control personnel were dispatched.

The cause was found to be open line wires which were twisted together by a tree leaning into the pole line.

The tree was cut away, line wire was repaired, signal and switch checks were made with no exceptions, and the signals were returned to service. The cause was determined to be external damage from the tree to the pole line wire.

248	8/24/2000	CSXT	APB			J769-24	Int Signals 762 & 738	N.E. Rensselaer, Rensselaer, IN	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

On August 24, 2000, the train crew on northbound Train J773-24 was clearing the main into the siding through a reversed switch at MP Q72.9 in order to allow northbound Train J769-24 to pass. While the switch was still reversed, J769-24 received a CLEAR signal at Q76.2 (which should have been APPROACH) and a CLEAR signal at Q73.8 (which should have been STOP). The signals were removed from service and Train Control personnel were dispatched.

The cause was found to be an open line wire wrap of the CHD wire (part of the 3-wire HD circuit) and CE1 positive battery wire (part of the approach circuit between the Rensselaer siding switches). The line wrap was removed, signal and switch checks were made with no exceptions, and the signals were returned to service.

231	8/25/2000	BNSF			ATC	BN2375	Track Ckt	Seattle, WA	N
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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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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646	8/25/2000	MRL	CTC			BNSF 4799	None	Missoula, Montana	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

On August 25, 2000 at approximately 08:27 hours, crew on eastward train STACSPM122 reported signal 1246 as displaying a Yellow over Lunar aspect when the next signal in advance at West Missoula was displaying a STOP aspect with the West Crossover lined reverse which was against the movement for this route. The proper aspect for signal 1246 at this time was Yellow.

Signal Department personnel were immediately notified and investigated this incident. During this investigation, personnel performed operating tests, indication locking tests, ground tests, meggering tests of all involved cables, tested all involved relays, tested involved searchlight signal mechanisms, took voltage readings on all involved equipment and tested the involved Electrocode units.

Signal Department personnel were unable to duplicate this alleged false proceed incident. All tests and inspections revealed the signal system functioned as intended.

266	8/26/2000	NS	CTC			BN 9647, BN 9648	Relay	Hammond, IN	N
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Failed Equipment or Device - Relay

At approximately 6:40 p.m., Saturday, 8/26/00, the crew of eastbound CSX train #939 with Engineer, Conductor, and Engineer Trainee, was moving on track #2 and went by signal 2E at CP 507 which was displaying a STOP aspect. Crew reported they had a CLEAR aspect at CP 508, the approach to CP 507, and were unable to stop.

Upon investigation, C&S personnel did observe the 508-2E signal display a CLEAR indication on track #2 EB with a train in the block immediately ahead.

It was determined that the 1EHPR signal control relay was sticking up when no energy was being applied to the coil due to worn and pitted contacts. Relay was replaced and signals restored to service.

277	9/1/2000	UP	CTC			UP3074	None	Dexter Junction, MO	N
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Loss of Shunt - Possible Rust or Foreign Material on Rail

On September 1, 2000 at 5:48 CDT at Dexter Junction on the Jonesboro Subdivision, southbound MINPB 01 on the main track at mile pole 40.3 reported the southbound signal (4L) displaying a Green aspect and as they proceeded they encountered the northbound LSV50 01, a local with a single 4-axle unit, in the same block.

An investigation revealed an oil film was present on the rail between Dexter Junction and Bernie causing a loss of shunt. It is unknown as to the origin of the oil film and it is under investigation.

The oil film was removed and the signal system operated as intended.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
263	9/3/2000	NS	CTC			NS 6189, MRL 030	Case Wire	Glenvar, VA	N
<p>Failed Equipment or Device - Electrical Ground (not in underground or aerial cable)</p> <p>At 3:48 p.m., 9/3/00, train #185V402 was westbound on Track #1 east of Glenvar, VA when they observed the westbound signal L-102, Track #2, displaying an APPROACH aspect with train #755V403 in the block on Track #2 just west of the L-102 signal. L-102 should have been displaying a STOP aspect with the block occupied by #755V403. L-102 is a color position signal.</p> <p>C&S personnel arrived and were to duplicate the scenario observed by the train crew of #185V402. Investigation found that the "H" relay was being falsely energized and held up by a 14 mil ground on the C-16 battery and a 4 mil ground on the B-16 battery. Several deteriorated case wires were replaced and the location was tested and returned to service at 7:40 a.m., September 4, 2000.</p> <p>This location was last checked for grounds on June 27, 2000 with no exceptions taken.</p>									
264	9/7/2000	NS	CTC			KCS6629	Wire	McConnell, AL	N
<p>Maintenance - Wiring Chewed by Rodents</p> <p>At 11:34 a.m. CST, train 339A7 reported that the south home signal (7RA) at McConnell, AL, MP 269.7, Alabama Division was at STOP and then upgraded to APPROACH with southbound train 21KA7 occupying the block ahead. Train 339 notified the dispatcher and train movements were protected. Signal personnel arrived on the scene and also observed the south signal (7RA) at McConnell was at APPROACH with train 339 occupying the block ahead.</p> <p>It was discovered through ground testing that the wire insulation in the south signal had been removed by rodents causing battery to energize the search light signal, resulting in the false signal.</p> <p>Wires were replaced and signal tested and placed back in service.</p>									
278	9/8/2000	UP	CTC			UP3702	None	Picacho, AZ	N
<p>Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)</p> <p>On September 08, 2000 at 01:02 MDT, at Picacho, AZ on the Phoenix Subdivision, eastbound LK172 07, on the Main Track at MP 978.6, reported the eastbound approach signal to Picacho at MP 978.60 displayed a Yellow over Yellow aspect and the eastbound absolute signal at Picacho displayed a Red over Red aspect.</p> <p>An investigation revealed a shorted underground cable to the eastbound approach signal at MP 978.60 caused the lower aspect to display a Yellow.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
279	9/20/2000	UP	CTC			UP6558	None	Atchison, KS	N
<p>Cause</p> <p>Narrative</p> <p>Human Error - Signal Circuit Design Error, Inadequate Service-Testing</p> <p>On September 20, 2000 at 13:15 CDT, at Atchison, KS on the Falls City Subdivision, northbound CWBCD 17 was on the Main Track at MP 329.50, south of Signal Z329. The Dispatcher was able to line northbound signal at Z329 with the A-B crossover north of northbound Signal Z329 reversed.</p> <p>An investigation revealed the normal switch repeater relay for the A-B crossover was not in the signal control for northbound Signal Z329.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</p>									
232	10/3/2000	BNSF	CTC			BNSF 9819, C-BTM	EC II Unit	Humboldt, NE	N
<p>Failed Equipment or Device - Electrocode Module</p> <p>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.</p> <p>Corrective Action Pending: Harmon/GE Harris Corp. has been notified in regards to the failure.</p>									
265	10/7/2000	NS	CTC			BNSF 9730	Relay	Pinola, IN	N
<p>Failed Equipment or Device - Relay</p> <p>At approximately 8:30 a.m., October 7, 2000 the train crew of #41M were stopped at the 2W signal at CP 466 when they observed the signal upgrade to APPROACH with a train setting, and visible, in the block ahead.</p> <p>Investigation by C&S personnel confirmed what the train crew saw and it was confirmed that signal 2W improperly displayed an APPROACH aspect with track ahead occupied. From the tests and simulations we identified a failure of the 4661 WHPR relay, a GRS 194 ohm Slow Release Relay, which remained stuck "up" when the battery to its coils was removed. Relay was replaced and signal 2W was returned to service at 10:30 p.m., October 7, 2000.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
249	10/13/2000	CSXT	APB			Q598-13	Semaphore Sig 147.0	Sugar Creek Bridge, Crawfordsville, IN	N
			Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)						
			At approximately 1200 on October 13, 2000, northbound Train Q598-13 reported that the signal at MP 147.0 was displaying a Yellow 45 degree signal (APPROACH) with northbound Train Q642-13 ahead in the block.						
			The cause was found to be damage to a temporary cable that had been installed across the bridge decking to facilitate bridge department crane work. The damaged cable was replaced with open line wire and placed back on the pole line. Signal checks were made with no exceptions, and the signals were returned to service.						
250	10/20/2000	CSXT	CTC			U833-17	#14 Dwarf CPL Signal	Mexico Tower, Cumberland, MD	N
			Failed Equipment or Device - Interior Wiring						
			At approximately 0113 hours on October 20, 2000, two engines (power for U833-17) were making an eastbound move from the Cumberland Terminal 4 East Lead to the PPG Lead. As the engines passed the #14 westbound signal on the PPG Lead, the crew looked back and observed the #14 signal displaying a RESTRICTED PROCEED (two reds over a "B" marker light) instead of STOP (two red lights) while one engine still occupied the track circuit behind the signal. The signals were removed from service, and Train Control personnel were dispatched.						
			The cause was found to be worn insulation on the cable for the "B" marker light, which had made contact with the energized Red aspect terminal buss. The cable was repaired, signal checks were made with no exceptions, and the signals were returned to service.						
280	10/20/2000	UP	APB			UP4051	None	Evanston, WY	N
			Maintenance - Switch Shunt Wires Broken						
			On October 20,2000 at 10:45 MDT, in Evanston, Wyoming on the Evanston Subdivision, eastbound ZLAAP 18 was on Track 2 and reported eastbound signal 917.4 was Green with the switch at MP 916.8 lined against him.						
			An investigation revealed the shunt fouling wires from the switch circuit controller were not connected to the rail on one side.						
			The signal system was restored to proper operation, and all applicable tests were performed.						

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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251	10/21/2000	CSXT		Remote		L256-21	2WA Signal	CP-124, Ridgeway, OH	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

At approximately 0500 hours on October 21, 2000, Train L258-21 was westbound on #1 track awaiting the 2WA signal to proceed into Hayes siding through the #4 crossover reversed. When the signal was received, the crew initially observed a RESTRICTING signal (NORAC Rule 29 - Red over Yellow) which changed to a MEDIUM CLEAR (Rule 283 - Red over Green). The signal should have been RESTRICTING. The signals were removed from service, and Train Control personnel were dispatched.

The cause was found to be a design error in the circuit, which included an extra wire allowing the 2WA-BDR to be energized when the #3 crossover was reversed regardless of the position of the #4 crossover. The wire was removed, signal checks were made with no exceptions, and the signals were returned to service.

267	10/21/2000	NS	CTC			NS 6776, NS 8613,	Human Error	Cleveland, OH	N
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Maintenance - Improper Adjustment, Track Circuit

At 1:30 p.m. on 10/21/00, train #24Z on track one observed signal 2E at CP Twin go from RESTRICTING aspect to a CLEAR aspect and back to APPROACH with a train ahead passing the next intermediate signal at MP RD-100.4, 7.7 miles ahead. The CLEAR aspect was only displayed 14 seconds before dropping to APPROACH, the proper aspect.

Upon investigation it was discovered that the working current on the 1004T relay was excessive, which resulted in the circuit failing to shunt for light engine 5096 moving in the block ahead of train 24Z.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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233	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)"

281	10/25/2000	UP	AB			CSXT 8670	None	Ogden, UT	N
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Vandalism - Instrument Case, Cable, or Junction Box Damaged

On October 25, 2000 at 13:30 MDT in Ogden, Utah on the Lakeside Subdivision, westbound ZAPT 25, on the main track, reported the westbound Signal 769.5 was Yellow with the track circuit west of the signal occupied.

An investigation revealed a road grader had struck the instrument case at MP 767.20 and tipped over the track relay for the track circuit west of westbound Signal 769.5.

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

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
647	11/2/2000	CN		Remote		Amtrak #51	8W Signal	Thornton, IL	N
							Human Error - Signal Circuit Design Error, Inadequate Service-Testing		
							8W signal displayed a SLOW CLEAR (R/G) into STOP (R/R) at UP home signal on the UP wye at Thornton Junction.		
							Cause: Wire/design error and insufficient testing at time of installation.		
							Corrective Action: Wire/design change to give a RESTRICTING signal (R/Y) at 8W to the UP wye track.		
648	11/5/2000	CN	AB			CN2415, CN5724	1614	Scotts, MI	N
							Human Error - Field Wiring Error, Inadequate Service Testing		
							On Sunday, November 5, 2000 at 1555 hrs, train M398-71-04 reported that ABS 1614 displayed a CLEAR with train E254-61-05 occupying the next block governed by ABS 1628. The ABS 1614 should have displayed an APPROACH. Failure to follow proper testing procedures resulted in this false proceed. A newly installed coded track circuit at ABS 1614 was miswired. The code 2 caused the signal to display CLEAR rather than APPROACH. The coded track circuit at 1614 was rewired and tested properly.		
234	11/7/2000	BNSF	CTC			H MOD SEL 907	CL	West Seligman, AZ	N
							Phantom Signal - Due to Sun Angle		
							On 11-7-00 at 15:42 the HMODSEL907 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 grounds 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?	
			Cause							
			Narrative							
282	11/7/2000	UP	CTC			UP6266	None	Taylor, TX	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			On November 7, 2000 at 01:49 CST in Taylor, TX on the Austin Subdivision, northbound MLDAS 06, on the main track, reported the northbound signal at CP Q146 was Green with the switch north at MP 144.8 lined reverse.							
			An investigation revealed a design error caused by a contact of the Normal Switch Relay not properly disabling the Electrocode Repeater at MP 145.20.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
235	11/9/2000	BNSF	AB			Train SCHCTAC2-0	S-Code Approach Lighting Module	Galena, Illinois	N	
			Failed Equipment or Device - S-Code							
			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.							
283	11/9/2000	UP	CTC			AMTK39	None	Ironton, UT	N	
			Vandalism - Instrument Case, Cable, or Junction Box Damaged							
			On November 9, 2000 at 06:31 MST in Ironton, Utah on the Provo Subdivision, eastbound AMT6-08, on Track #1, reported the eastbound approach signal at MP 699.80 to Ironton displayed a Green aspect with the crossover in Ironton lined and occupied.							
			An investigation revealed the signal case at MP 699.80 had been struck by a vehicle on the service road and the 98H and 98D relays were upside down.							
			The signal system was restored to proper operation, and all applicable tests were performed.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
284	12/2/2000	UP	CTC			N/A	None	Kansas City, KS	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			On December 02, 2000 at 13:15 CST in Kansas City, Kansas on the KCT Subdivision, westbound signal at MP 5.0 was Yellow with a switch west of the signal in the reverse position.							
			An investigation revealed that during field wiring changes a wire had not been removed that held up the GZP relay which allowed the signal to display a Yellow (APPROACH) with signal's H relay down.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
653	12/4/2000	WC		Manual		BYFDIT	Signal 10LA - Case	Schiller Park, IL - B12 Interlocker	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			Northbound train BYFDIT reported a CLEAR aspect at approach signal 139 into a STOP (Red) absolute signal 10LA at B12.							
			After testing and investigation it was discovered that Code 7 (CLEAR) was being transmitted to the south from 10LA to 139 while the IHB route was lined northbound. This was the result of a defective circuit design. The circuit was repaired to send an APPROACH code (C-2) to the approach 139 when the IHB is lined for a northbound route.							
236	12/8/2000	BNSF	CTC			LAUPT1 06	Relay	West Stevenson	N	
			Failed Equipment or Device - Relay							
			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.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
285	12/9/2000	UP	AB			Unknown	None	Houston, TX	N	
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)							
			On December 09, 2000 at 3:34 CST in Houston, Texas on the Strang Subdivision, northbound YGP7208 reported the northbound intermediate signal at MP 1.8 was Green into a Red northbound signal at MP 104 (tower 88).							
			An investigation revealed two pole line wraps that false energized the 02GCP D line wire and allowed the signal at MP 1.8 to display a Green aspect.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
253	12/12/2000	CSXT	CTC			M742-11	#6 Dwarf Signal	N.E. Live Oak, Live Oak, FL	N	
			Human Error - Improper Circuit Jumper in Place							
			At approximately 0040 on December 12, 2000, Train M742-11 backed southward into the siding at the North End of Live Oak MP SP 713.4 on the Tallahassie Subdivision. When the switch into the siding was restored to normal, the crew observed that the dwarf signal governing movement out of the siding displayed a Red over Yellow (MEDIUM APPROACH) signal. The signal was removed from service and Train Control personnel were dispatched.							
			The cause was found to be a jumper which had been installed the previous day to set the lamp voltage on the Yellow aspect after replacing the dwarf signal, which had been damaged by track equipment. This jumper caused the Yellow aspect to be continuously illuminated. The jumper was removed, signal tests were made with no exceptions, and the signals were returned to service.							

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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654	12/18/2000	CP	CTC			CP8507	X-Over Switch	South Milwaukee, WI	N
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Cause
Human Error - Improper Circuit Jumper in Place

Narrative
 Nature of Failure:

On Dec. 18, 2000 at approx. 1300 CP8507, with Engineer Skotartzak and Conductor Franklin, proceeding east on #2 main track approaching control point at Lake had a CLEAR signal to proceed east on #2 main track with the east end of the west crossover (#5) lined reverse.

Just previous, a westbound Amtrak train had crossed over from #2 main track to #1 main track at the west crossover (#5) at Lake.

After Amtrak had passed control point at Lake, Dispatcher requested west crossover (#5) to be lined normal and requested an eastbound absolute signal on #2 main track at Lake to be cleared. The switch on the west end of the west crossover (#5) went normal and the switch at the east end of the west crossover (#5) did not move, staying reverse. The west crossover (#5) indicated both ends were lined normal and the eastbound absolute signal cleared.

Signal Maintainer K.D. Huebner noticed the malfunction and stopped train CP 8507 before running through the switch.

Cause and Corrective Action:

Further investigation revealed a jumper wire in the GRS 5F switch machine on the east end of crossover had been applied across terminals 1 and 8 which would allow the crossover to indicate normal or reverse dependent upon position of the crossover switch on the west end of crossover. It is unknown why the east end of the crossover (#5) did not move to normal as requested but frost in contacts or armature is suspected.

Corrective action taken was removal of the jumper from contacts 1 and 8 and crossover tested by removing power from each end simultaneously requesting opposite end of crossover to go normal or reverse and verifying if either end is not in correspondence and it will not indicate. Immediately all crossovers on the CP Railway (Soo Line) utilizing GRS Model 5F switch machines were inspected and found to be correct. CP Railway (Soo Line) is presently drafting a test procedure to be done every 2 years in conjunction with RS&I Rule 236.380 Indication Locking test utilizing the above testing procedure.

254	12/21/2000	CSXT	CTC			K996-20	None	Mango, FL	N
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Failed Equipment or Device - Relay

On December 21, 2000, K996-20 while traveling SB reported the SAS at NE Mango displaying an alleged CLEAR indication. K996-20 reported a STOP indication at the SAS SE Mango coming to a controlled stop beyond the limits of the SE Mango. Signals were immediately removed from service at the NE and SE Mango. Additionally the train dispatcher reported an inability to control the signal at the NE Mango prior to the arrival of K996-20. K996-20 was instructed to handle the switch NE Mango from motor to hand lining the switch reverse and restore the switch to motor position. K996-20 failed to perform this instruction. Subsequent investigation revealed no exceptions. Additional field investigation was performed by CSX and the signal mechanism apparently operated slower than normal. The signal mechanism was replaced and after full operational testing the signal was restored to service. On January 4th FRA performed a field investigation and made an assumption alleging that the signal mechanism was slow on December 21, 2000. We are reporting this but we do not consider this to be a false proceed.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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317	1/3/2001	UP	CTC			UP 9201	None	Anita, CA	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On January 3, 2001 at 11:30 PST, at Anita, CA on the Valley Subdivision at MP 193.95, southbound QUERV 02 on the main track reported the southbound signal at the north end of Anita displaying Flashing Yellow, and the southbound signal at the south end of Anita displayed Red.

An investigation revealed the control wires for the H circuit at the south end of Anita were reversed.

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

310	1/4/2001	NS	CTC			P42P3	Phantom Signal	Thicketty, NC	N
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Phantom Signal - Due to Sun Angle

At approximately 5:04 p.m. on 1/4/01, train P42P3 running northbound reported a signal problem with the 4354 northbound intermediate signal at MP 435.4. Train P42P3 was northbound on track two returning to a cut of 15 cars it had left on track two north of the 4354 intermediate signal. Upon approaching the 4354 signal northbound, the crew first observed a RESTRICTING Red over Red aspect. As they got closer to the signal, it appeared to them as an APPROACH, Yellow over Red aspect. The engineer called the dispatcher and reported that he thought there were signal problems at the location. The dispatcher called signal personnel to investigate. Investigation revealed no exceptions with signal circuits, grounds or relay operation. However, it was determined that the sun was shining directly into the signals at the time of the incident and the situation would be reenacted at 5:00 p.m. on 1/5/01, as a phantom aspect was suspected.

Conditions were almost identical to the previous day during the reconstruction. The same crew and train P42P3 were used, with signal officers on board to observe the signals. At a distance the RESTRICTING aspect was visible on signal 4354. When the train got within 600' of the signal, an APPROACH aspect could be distinguished and the top head green lens appeared dimly lit on signal 4354.

It was observed that the signal was affected by the sun's glare, and the top head appeared to have all three units (green, yellow, and red) burning dim and of equal intensity. Such an aspect would have been interpreted as an improperly displayed signal, rather than an APPROACH. However, the possibility of an APPROACH aspect could not be discounted.

Adjustments were made to make the signal aspects easier to discern in the afternoon sun. This involved bulb voltage adjustments, sighting alignment and installing long signal hood covers.

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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655	1/12/2001	IHB		Manual		CSX Train X747-11	Signal 7	Hohman Tower, Hammond, IN	N
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Human Error - Train Crew Took Wrong Signal

Light power from CSX train X747-11 was traveling from IHB Gibson Yard to CSX Barr Yard. Train was stopped at westbound home signal no. 7 at Hohman Tower, Hammond, IN. Operator made the line up for IHB train BA3, also westbound, to proceed west from Track 4 to Track 3 and pulled signal lever 9 to clear signal for IHB train BA3's movement from Track 4 to Track 3.

CSX crew on train X747-11 claims that signal 7 cleared to RESTRICTING aspect (R/Y) for Track 3. Upon receiving this signal, train X747-11 proceeded west and ran through the reverse side of the west end of crossover 15 which was lined against their movement. During interviews following this incident, the CSX crew repeatedly claimed that they had a "bottom yellow" on signal 7. IHB crew on train BA3 claimed they could see the RESTRICTING signal (R/Y) but could not determine which track it was for. As information, both signal 7 and signal 9 are located above the Engineer's rail on a signal bridge.

Signal Department was notified and responded to the scene to investigate. Signal personnel found that the control lever for crossover 15 was locked in the reverse position and the control lever for signal 9 was in the CLEAR position as described by the Tower Operator. The control lever for signal 7 was locked in the STOP position.

After the damaged rods in the switch machine were replaced, signal personnel attempted to re-create the situation as described by the crew of CSX train X747-11. In each instance when the control lever for signal 9 was pulled with crossover 15 reversed, signal 9 cleared to RESTRICTING (R/Y) as intended and signal 7 remained at STOP.

After failing to re-create the alleged false proceed, signal personnel then performed all appropriate tests on the signals, switches and cables with no problems found and no exceptions taken to any test results.

The train crew waived formal investigation and accepted discipline.

318	1/18/2001	UP	CTC			UP 743	None	Houston, TX	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On January 18, 2001 at 8:40 CST, in Houston, TX, on the Terminal Subdivision, westbound YEW50 18, on track NR2, reported the westbound 1-14-RD signal at LF395 was Green with the westbound 1-24-R signal at LR 360 displaying a Red.

An investigation revealed that the mechanism polarity wires at the westbound 1-14-RD signal were reversed.

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

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
300	1/25/2001	CSXT	CTC			None	Switch Repeater	318-2 EB Int. Signal, Maidens, VA	N
			Human Error - Field Wiring Error, Inadequate Service Testing						
			<p>EB Train V454-22 while running on Number 1 track observed the EB Intermediate signal on Number 2 Track displaying a RESTRICTED PROCEED signal which upgraded to APPROACH while the block ahead was occupied by the B010-25 working at Wood Yard Switch on Number 2 Track. The signal was immediately removed from service. Investigation revealed a wiring change error due to a switch's derail removal. The wiring error was a misapplication of relay tag identity and connecting the wiring to the wrong switch repeater relay thus eliminating a track circuit break in the switch repeater circuit. Wiring was corrected and full operational tests were made. Signal was restored to service.</p>						
656	1/26/2001	DH	CTC				Signal 584.4	MP 584.4, Afton, NY	N
			Scenario Reenacted, Unable to Duplicate, No Defects Found						
			<p>The following incident was reported to B. Velasco from T. Otis. A southbound train #8859 (empty coal train) reported having a CLEAR signal at the south approach (signal 584.4) to CPF587, and then stated that the southbound home signal at CPF587 was at STOP and the switch was in the reverse position. They reported putting the train in emergency and stopping approximately one car length north of the southbound home signal.</p> <p>Several tests were made at that time to find a cause. No cause has been found and testing is ongoing at this time, by use of recording devices.</p>						
301	2/6/2001	CSXT	CTC			Q453-06	Phantom Aspect	10 Signal So. Wye, Waycross, GA	N
			Phantom Signal - Due to Sun Angle						
			<p>16:35, 02-06-01, 10 Signal at Waycross south wye was over-run by Q453-06 to track J02 south bound. Train crew reported they had stopped and rechecked the 10 signal indication and agreed on the RESTRICTING indication and passed the signal. Upon arrival, signal personnel observed the sun shining directly into the 10 signal, with Q453 stopped occupying yard lead, 10 signal OS, 5 switch normal, and J02 track. The top red aspect was clearly visible. The middle aspect indicated a white reflection from left to right, approximately 1" in height, top and bottom part of lens was darker in appearance. The bottom red aspect indicated dull red to orange appearance. Signal personnel performed full operational checks and inspections with no exceptions noted. Signals returned to service at 21:00 on 02-06-01. A test with a locomotive, signal & transportation personnel occurred on 02-07-01 at 16:30 to simulate the previous day's conditions. The test was conducted with bright sun shine conditions. While on a locomotive about 30 feet from 10 signal, observing personnel could not determine when the signal had changed from STOP to RESTRICTING with direct sun light into the face of the signal. Signal department immediately changed the lower red lens, screening and installing longer hoods. We are reporting this event but we do not consider this to be a false proceed.</p>						

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
302	2/19/2001	CSXT	CTC			Q297-19	Design	PA Tower, Fort Meade, MD	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			At about 2130 on 2-19-01 B702-19 was traveling WB on #1 Track crossing over to #2 Track at Savage. After B702 cleared Savage, Train Dispatcher requested #3 crossover Savage normal and #8 Signal WB on #2 Track behind B702 for a following train Q297-19. As Q297 approached the #2 WB signal at PA Tower the train crew reported an APPROACH MEDIUM signal with B702 ahead in the block west of Savage. This signal should have been an APPROACH signal into the RESTRICTED PROCEED following B702. Signals were immediately removed from service and Train Control personnel dispatched to the location for investigation. The investigation revealed a design error at Savage that allowed a Code 3 generated and sent to PA Tower when a RESTRICTED PROCEED signal was displayed at Savage. A corrected design was sent to the field and installed. Full operational checks were made and the signals were restored to normal service at 1500 on 2-21-01.							
286	2/24/2001	BNSF	CTC			P EPEKCK1 24A En	None	Camden, MO	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			Train P EPEKCK1 24A, traveling west on main track 3 (Norfolk Southern track), observed a Red over Flashing Yellow on the 6L (Norfolk Southern signal) at CA Jct. Control Point, for a move from main 3 to main 1. The signal should have displayed Red over Yellow. This signal had been overlooked when plans were issued to change the Red over Flashing Yellow to Red over Yellow on this Subdivision to conform to current BNSF signal aspects. Temporary circuit changes were made to correct the condition until permanent circuit plans are issued. The Signal was tested and placed back in service.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
657	2/27/2001	MRL	CTC			MRL 406	WP Circuit	Livingston, MT	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			<p>On February 27, 2001, Signal Maintainer Mike Hardesty observed the 841 local crossing over from the east leg of the Y at Livingston to the yard when he observed the WP relay at Livingston Hump in the energized position. The WP relay should have been deenergized at this time since two of the 3 hand operated switches in this WP circuit were in the reverse position.</p> <p>Signal Department personnel immediately corrected the problem by making the appropriate circuit changes. Tests were performed to verify the signal system functioned as intended.</p> <p>Investigation by Signal Department personnel revealed that this problem occurred when signal crew 101961 cut over a new underground cable for the west leg of Y switch and thereby removed the WP circuit from the Yard Switch and east leg of Y switch. The Signal Foreman took full responsibility for this error and stated the error occurred because he did not know that all 3 switches were on the same WP circuit. The Signal Foreman was relieved of all Foreman responsibilities pending a fact-finding hearing.</p> <p>On March 9, 2001, a fact finding hearing was held to determine the facts involving this incident. In the fact finding hearing the Signal Foreman accepted full responsibility for this incident. The Foreman stated in the hearing that he thought this was a simple circuit change and did not see a need to consult with his Supervisor prior to performing the work. Although this was not intentional interference, this incident happened because the Signal Foreman interfered with vital circuits and did not make the appropriate tests to ensure the integrity of the signal system. Upon review of the official transcript, disciplinary action will be taken as deemed necessary.</p>							
659	2/28/2001	METX	AB			Train 730 (MU)	22 HD Relay	Richton Park, Illinois	N	
			Failed Equipment or Device - Relay							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
660	2/28/2001	SDNR		Remote			Improper Wiring of 4WBFLHR Circuit	CP Ash, San Diego, California	N
<p>Cause</p> <p>Narrative</p> <p>Human Error - Field Wiring Error, Inadequate Service Testing</p> <p>On February 28, 2001, while Amtrak train #573 was occupying track #3 with a properly displayed aspect on the 4WA signal (Flashing Yellow over Red), the engineer reported that 4WB signal on an adjacent track #4 was displaying a Dark over Flashing Red signal. This was an improperly displayed aspect on the 4WB signal. The aspect should have been Dark over a solid Red signal, with the top aspect lamp burned out.</p> <p>Upon investigation, it was determined that the 4WB signal on track #4 had a burned out lamp in the top aspect and an improperly wired flasher circuit in the bottom aspect. On February 28, 2001 the lamp was replaced on the top aspect of the 4WB signal. On March 2, 2001 a bulletin order was put into effect instructing all engineers to notify the dispatcher's office and receive permission by any Flashing Red aspects at CP Ash until permanent corrections could be made. On March 5, 2001, permanent corrections were made to wiring of the 4WBFLHR circuit. Tests were conducted and the 4WB signal displayed all the proper aspects and functioned as designed.</p>									
658	2/28/2001	ST		Remote		305, 307, 301	VHLC	CPF-266, Wells, Maine	N
<p>Insufficient Information in Report to Assign Cause</p> <p>POSE West - Lite Power (Engineman & Conductor) EDPO.A East (Engineman & Conductor) - Eng. 351, 318, 326, Cars 3/21</p>									
303	3/10/2001	CSXT	CTC			V829-10	Phantom Aspect	D Tower, Grafton, WV	N
<p>Phantom Signal - Due to Sun Angle</p> <p>On Saturday evening March 10, 2001 eastbound train V829-10 running from the Fairmont Subdivision to D Tower at Grafton reported a RESTRICTING signal. Initial investigation revealed that the signal had not been requested by the Jacksonville dispatcher. Signals were removed from service pending investigation. The field investigation revealed that the signal was at STOP but was sunlit. The team refocused the signals and installed an additional screening material as the signals already had Phankill installed. We are reporting this event but we do not consider this to be a false proceed.</p>									
304	3/11/2001	CSXT	CTC			N773-05	Phantom Aspect	North Acca, Richmond, VA	N
<p>Phantom Signal - Due to Sun Angle</p> <p>On Sunday, 3-11-01 at about 10:45 hours crew on northbound N773-05 reported a RESTRICTING signal on the northbound signal #4 track at North Acca. Initial investigation revealed the signal had not been requested by the Jacksonville dispatcher. Signals were removed from service pending investigation. Field investigation revealed the signal was at STOP but was sunlit. A long hood was installed on the bottom green unit which was sunlit and appeared Lunar. We are reporting this event but we do not consider this to be a false proceed.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
287	3/12/2001	BNSF	AB			C CAMRTR001, En	None	Elesberry, MO	
305	3/12/2001	CSXT	CTC			Q245-10	Workmanship	Vandalia, OH	N
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing						
			On 3-12-01 train Q245-10 received a MEDIUM CLEAR signal entering the siding at Vandalia into a MEDIUM CLEAR signal crossing over at Vandalia crossover. Signals were removed from service pending investigation. Field investigation revealed that recently installed signals were designed for medium speed while a slow speed crossover was in service. The signals were immediately downgraded to RESTRICTING and STOP. Proper test and inspections were performed and signals were restored to service.						
661	3/13/2001	ST		Automatic			GRS B-1 Relay	Detroit, Maine	N
			Failed Equipment or Device - Relay						
			Local WA2 (Conductor, Engineer) - cars 5/10, power 72-77 POBK (Conductor, Engineer) - cars 7/69, power 317-216-372-329						
662	3/22/2001	AMTK		Remote		Engine 1016, Train	L716 Signal	Somerville, Massachusetts	N
			Signal Equipment and/or Circuits Flooded						
			Engineer on train no. 204 reported that dwarf signal L716 at Reading Junction was displaying a MEDIUM CLEAR (Green over Flashing Red) with signal L670 at FX displaying Red over Flashing Red (imperfectly displayed). Upon investigation it was found that due to high water conditions at FX Interlocking, false energy was allowed to flow due to grounds, causing the L670 AYPR, L670 AGPR, L670 BYPR, and L670 BGPR relays to be energized at FX Interlocking. This resulted in L716 signal at Reading Junction displaying a false proceed due to false energy on the signal control relays at FX Interlocking. Signals were removed from service until floodwaters receded. After signal components were cleaned and dried out, the signal system was tested and placed back into 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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319	3/28/2001	UP		Manual		Unknown	None	West Bridge Jct., LA	N
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Human Error - Improper Circuit Jumper in Place

On March 29, 2001 at 17:00 CST, at West Bridge Jct., LA, on the Livonia Subdivision, the westbound signal #7 at MP 10.2 stayed Yellow after a westbound train passed it and occupied the track circuit west of the signal #7.

An investigation revealed that pulling levers for signals #6 and #7 in the mechanical interlocker created a bridge that applied battery which held signal #7 Yellow.

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

288	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.

320	4/4/2001	UP	CTC			UP3958 North	None	Gorham, IL	N
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Human Error - Signal Personnel Introduced False Energy into Signal System During Testing

On April 4, 2001 at 11:00 DST, at Gorham, IL on the Chester Subdivision, northbound QNLPI-03 received a northbound DIVERGING CLEAR signal (Red over Red over Green) at CP D085 at MP 84.8 into a dark signal at CP C338.

An investigation revealed that a signal gang, while cutting over new CP D338 had inadvertently applied battery to the 48DPR circuit which caused the DIVERGING CLEAR signal at CP D085.

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

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
323	4/4/2001	UP	AB			UP4267	None	Optima, OK	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			On April 4, 2001 at 11:00 CDT, at Optima, OK on the Pratt Subdivision, eastbound MWCHN 02, on the main track at MP 460.80, reported a CLEAR eastbound signal at MP 460.80, with a switch reversed east of the signal.							
			An investigation revealed that the switch circuit controller was improperly wired.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
324	4/5/2001	UP	CTC			UP4128	None	Ogden, UT	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			On April 5, 2001 at 12:20 MDT, at Ogden, UT on the Lakeside Subdivision, westbound AKSBEX 03, on the main track at MP 759.00, reported a Yellow over Red westbound signal at MP 759.0 with the next block occupied.							
			An investigation revealed that the eastbound and westbound signal control wires were connected together at the 7577 track relay.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
337	4/7/2001	BNSF	CTC			ID # EMLMEBM001,	1WA Signal	Napier, MO	N	
			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?	
			Cause							
			Narrative							
289	4/8/2001	BNSF	CTC			ID# MLAULIN1-05A	Human Error	Yuma, CO	N	
			Human Error - Improper Equipment Installed							
			<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>							
290	4/11/2001	BNSF	CTC			Train YEMP2011-1	Phantom Aspect Signal	Emporia, Kansas	N	
			Phantom Signal - Due to Sun Angle							
			<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>							
306	4/11/2001	CSXT	CTC			U724-10	Workmanship	Sproul, WV	N	
			Maintenance - Switch Circuit Controller							
			<p>On 4-11-01, train U72410, coming off the Coal River Subdivision, reported an APPROACH signal westbound at Sproul Junction immediately after T78308 cleared OS circuit ahead. This should have been RESTRICTING. T78308 was a westbound train on the Big Coal Subdivision. The signals were removed from service pending investigation. The field investigation revealed that the reverse point detector stud had become loose and backed off on a T-21 hand throw switch for the spur track. This allowed both NWP and RWP relays to become energized at the same time. A contributing factor was the absence of a check circuit that would prevent the energizing of both the NWP and RWP relays simultaneously. Changes have been made and signals restored to service.</p>							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
321	4/11/2001	UP		Manual		BNSF 9788	None	Wagoner, OK	N
<p>Cause</p> <p>Narrative</p> <p>Failed Equipment or Device - Interior Wiring</p> <p>On April 11, 2001 at 16:30 CDT, at Wagoner, OK on the Cherokee Subdivision, southbound CGDRO 10, on the main track at MP 486.3, reported the southbound approach signal to the Wagoner Interlocker displayed an APPROACH DIVERGING (Yellow over Yellow) into a Red southbound home signal.</p> <p>An investigation revealed that lightning had melted two wires together, which applied voltage to the bottom aspect of the southbound approach signal.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</p>									
322	4/13/2001	UP	CTC			Unknown	None	Caldwell, TX	N
<p>Failed Equipment or Device - PMTC Card</p> <p>On April 13, 2001 at 06:07 CDT, at Caldwell, TX on the Flatonia Subdivision, westbound RHTCW-12, on the main track at MP 30.95, reported the westbound signal at FL031 was Green and the westbound signal at FL032 was Red.</p> <p>An investigation revealed a bad order PMTC receiver card at FL031.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</p>									
663	4/21/2001	CN		Manual		4601	36B Signal	New Orleans, LA	N
<p>Scenario Reenacted, Unable to Duplicate, No Defects Found</p> <p>On April 21, 2001 at approximately 11:10 a Union Pacific train crew AV07 went by 36B signal with an alleged CLEAR signal (Green over Red) and proceeded into the plant when he noticed 19 switch lined against them. The train crew notified the East Bridge Operator, and the operator said he hadn't pulled the lever to give them the signal.</p> <p>There was a BN train on the Public Belt track going up the Huey P. Long Bridge. He had the 31 signal lined and the lever still out. 20, 21, and 22 switches were already lined reverse for the UP crew AV07 but 18 and 19 switches were still lined normal.</p> <p>The Inspector arrived at about 13:10 and found 36B signal vandalized. All the hoods were knocked off and the lenses had been hit with rocks and were cracked. At this time the Red aspect could be seen, and not mistaken for anything other than a Red, from the Shrewsbury crossing just south of the signal. Inspector checked for grounds at the signal house, no grounds found. He went over the steps the operator had taken that morning and attempted to reenact the incident. The 36B signal remained Red. When 18 and 19 switches were normal and the operator cleared 36B signal, the inspector reported the signal was Yellow over Red. Then the operator lined the route up to the bridge, 18 and 19 switches lined reverse and called for the 36B signal. 36B was Yellow over Red. All circuits were clear going up to the Huey P. Long Bridge and no grounds were found at East Bridge. The reported incident could not be reproduced. Due to excessive vandalism at this location, on April 25, 36A and 36B signals and the cable were replaced for precautionary reasons.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
307	4/27/2001	CSXT	CTC			T676-23	Workmanship	Apex St. Albans, St. Albans, WV	N
			Human Error - Field Wiring Error, Inadequate Service Testing						
			<p>At 0216 hours on April 27, 2001, the train crew of T67623 reported having a MEDIUM APPROACH SLOW (R/Y/G) into a MEDIUM APPROACH EB signal at the Apex Wye at St. Albans. The eastbound signals were removed from service at the Apex Wye at St. Albans. The proper signal should have been a SLOW CLEAR (R/R/G). This was confirmed in testing by signal personnel. The preliminary investigation revealed a wire in the lighting circuit was incorrectly wired to the heel contact of the LA8JR. The wire should have been on the back contact of this relay. This allowed the Yellow aspect to be energized rather than the Red aspect. After consulting with signal design personnel, wiring was corrected and testing completed. The signals were returned to service.</p>						
311	5/8/2001	NS	AB			9571	Line Wire Circuit	Columbus, OH	N
			Vandalism - Pole Line						
			<p>At approximately 10:18 a.m. on May 8, 2001 Train No. 615 southbound reported a CLEAR signal indication at automatic signal 134.1 with automatic signal 135.1 at STOP AND PROCEED and southbound train LY18 approximately 500 feet in advance of the signal 135.1. Crew of train 615 stopped approximately 1000 feet short of signal 135.1 and notified the Dearborn dispatcher.</p> <p>C&S personnel investigated and found a piece of line wire bridging the line wire circuit between the H and D wires. The wire was laying across the line wires at MP AM 134.9. The line wire was inspected and the signals were restored to service.</p>						
291	5/9/2001	BNSF	CTC			BNSF 8234, Train P	Improper Wiring - Human Error	Vernon, CA	N
			Human Error - Field Wiring Error, Inadequate Service Testing						
			<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>						
665	5/9/2001	DH	AB				Signal 588.6A	MP 588.6, Afton, NY	N
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)						
			<p>Su2 was stopped at CPF590 on the controlled siding with train #550-08 stopped behind them at signal 588.6 waiting for a northbound train. CPF590 was cleared north on the main track. Train 550-08 had reported that signal 588.6A (southward approach to CPF590 on the main tk) was going from Red to Green. Su2 reported CPF590 staying at STOP. The cause was overhanging tree limbs at MP 589.2 wrapping line wires #3 and #4 on the middle crossarm. Pin #3 is 29LAHD and Pin #4 is 116.2CHD. This condition had signal 588.6A going Red to Green. After the line wires were unwrapped to clear the problem we had then resimulated the problem by putting the wires back together. The signals were returned to service at 13:14 hrs on 5-11-01.</p>						

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
664	5/9/2001	IMRL	APB			IMRL 358	None	Savanna, IL	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			On May 9, 2001, Engineer on train I 111B 07 reported that while proceeding eastward on No. 2 Track to run around train occupying the Main Track, both eastward signals at Plum (No. 2 Track and Main Track signals) displayed CLEAR aspects simultaneously. At this time the proper aspect for the eastward signal governing movement on the Main Track was CLEAR and the eastward signal governing movement on No. 2 Track should have displayed a Red.							
			Signal Department personnel immediately investigated this incident and determined the signal system functioned as intended. Personnel meggered all underground cables, tested relays, performed ground tests, performed switch tests, performed fouling tests and tested searchlight signals. Personnel also performed operating tests multiple times to recreate this incident. Subsequent to tests, signal system functioned as intended.							
325	5/9/2001	UP	CTC			UP7578	None	Orogrande, NM	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			On May 9, 2001 at 12:31 MDT, at Orogrande, NM on the Carrizozo Subdivision, eastbound ILCIM-08, on the main track, was lined to the siding, and at MP 921.80, reported the eastbound signal at TC922 at West Orogrande was Red over Yellow (DIVERGING APPROACH), with a switch in the siding lined against him.							
			An investigation revealed the Switch Circuit Controller was wired incorrectly causing the Normal Switch Repeater Relay to energize with the switch reversed.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
666	6/4/2001	NICD	APB			2006	Line Circuit	Michigan City, IN	N	
			Vandalism - Signal Damaged, Caused Unintended Signal Aspect							
			Foreign signal governing entrance to NICTD main line was vandalized causing false feed of line circuit controlling NICTD dwarf signal 317. False feed was removed and signal tested okay. Foreign line is now locked out of service. NICTD is developing plans for new NICTD-maintained dwarf signal governing entrance to mainline from foreign railroad.							
667	6/5/2001	DH	AB			Train #268	Signal 2.2	Menands, NY	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			Train #268 had reported that the southbound signal at CP04 went from STOP to CLEAR (for about 2 sec.) and back to STOP again. The work train (2 lite engines) was going south ahead of train #268. When the work train went past signal 2.2, it caused the timing between the Electrocode circuits south of the signal and the DC battery circuits north of the signal to allow this condition to exist. We have corrected this timing problem and retested the signals.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
668	6/5/2001	DH		Remote		Train #SCR	Eastward Home Signal CPF467	Mechanicsville, NY	N
<p>Cause</p> <p>Narrative</p> <p>Phantom Signal - Due to Sun Angle</p> <p>The Springfield Terminal Dispatcher had called train #SCR to see why they had proceeded through the control point at CPF467. The Dispatcher did not have a signal cleared at this location. At this time train SCR had reported that they had an APPROACH signal at CPF467. The signal at CPF467 was out of focus due to a broken bracket that held the signal housing. With the signal out of focus and the position of the sun shining on the signal had caused the signal to appear Yellow. The signal bracket was replaced and the signal was refocused. The signal was rechecked under the same condition and the signal displayed the proper aspects.</p>									
669	6/8/2001	MNCR		Remote		Train #708, Engine	2S Signal	CP 58 - Beacon, NY	N
<p>Failed Equipment or Device - Insulated Joint(s)</p> <p>Train #708 received a NORMAL cab signal for a short period of time when the 2S signal at CP58 was at STOP, due to a failure of the insulated joints adjacent to the signal. The failure downgraded the signal to STOP as the train approached, while permitting cab signal intended for this train after passing the signal, to be received before passing the signal.</p>									
326	6/11/2001	UP	CTC			UP3035	None	Council Bluffs, IA	N
<p>Phantom Signal - Due to Sun Angle</p> <p>On June 11, 2001 at 15:30 CDT, at Council Bluffs, Iowa on the Omaha Subdivision, westbound UP 3035 on Track 2 at CPB 001 reported the Dwarf Signal #20 gave a Red over Lunar aspect.</p> <p>An investigation revealed the lower unit of the dwarf signal had a burned out bulb, and was dark on red. The sun wash into the lenses gave it the appearance of a lunar aspect.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</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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312	6/16/2001	NS	CTC			NS 9360	Track Circuit	Briswold, GA	Y
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On 6/16/01 at 12:45 a.m. near Control Point East Griswold, GA at MP S181.1, Georgia Division Train # 191G515, lead unit 9360, struck the rear car JMHX 69090 of Georgia Division train # 119G514. Train #119 was at a stop waiting for train #192 going eastbound into the siding track at Control Point West Griswold at MP S182.7, train #191 was westbound following train #119.

The westbound signal at East Griswold displayed an APPROACH aspect for the main track and with the main track between east and west Griswold occupied by train #119. Train #119 was waiting for eastbound train #192 to enter the siding and then was to continue westbound. Train #191 was to follow train #119 westbound and occupy the main track between the switches at Griswold, clearing the way for train #192 to proceed through the siding to the main track at East Griswold. Train #191 had a CLEAR signal at the approach signal at MP S178.2 and then an APPROACH aspect at the westbound control signal at East Griswold. The approach signal should have displayed an APPROACH aspect at S178.2 and the control signal at East Griswold should have displayed a STOP aspect. The conditions were able to be recreated and the false clear aspect displayed numerous times during testing.

The circuitry involved is the track transmission and receive circuits of the Union Switch and Signal track code logic. This coded track circuitry was modified in January 2000 for a highway grade crossing upgrade installation at Henderson Road crossing at MP S181.1. The upgrade included the installation of a code isolation unit that is supposed to isolate the signal system track coming from the detection circuits of the highway grade crossing equipment. Testing showed that the code isolation unit was reflecting the coding information sent by the East Griswold location back into itself, through a capacitance effect generated by the isolation unit.

The application of this particular code isolation unit in the circuit was modified after consultation with the supply vendor to eliminate the fault condition. In addition, electronic track circuit equipment will be installed as this type circuitry would eliminate the need of the code isolation unit and the fault condition altogether.

670	6/19/2001	METX		Manual		EJ&E #666	Tested/No Defects (see attached)	Spaulding Interlocking, MP 32.6, Chicago, Illin	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

Westbound EJ&E locomotive #666 reported a CLEAR signal at Spaulding, signal 10L. Train proceeded past signal for head-room to shove back into Spaulding Yard. Operators claim that no signal was displayed for that move.

Signals at Spaulding Plant were put to STOP until Plant could be inspected. The following tests were performed: 236.102, 236.107, 236.109, 236.378, 236.379, 236.380. Test results were recorded and plant was found to be working as intended. (results attached) Plant was placed back in service at 12:01 AM with no restrictions.

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
671	6/20/2001	CR					As Information Only.	CP Mill, Ecorse, MI	N
<p>Cause</p> <p>Human Error - Improper Circuit Jumper in Place</p> <p>Jumper applied to 2TPR for track work, not removed when Track Department finished. Jumper removed and employees responsible disciplined.</p>									
672	6/21/2001	AMTK		Remote		Engine #552	42EA Signal	Sunnyside Yard "R" Interlocking, Queens, Ne	Y
<p>Cause</p> <p>Human Error - Signal Equipment Improperly Installed</p> <p>Switching engine #552 (operating as switching crew 53A with 1 car) was operating east at signal 42EA with RESTRICTING signal aspect being displayed for a move from track #30 to Lead #3 thru #35 crossover to Lead #4. When engine #552 physically entered Lead #4, car #48981 of Amtrak train #102 was struck account being in foul of #35 crossover. Upon investigation, insulated rail joint separating 402 and 403 track circuits on Lead #4 was incorrectly installed too close to the west of east end of #35 switch. Insulated rail joint has been relocated 47' west of the existing joint location allowing proper clearance. Further investigation into determining responsibility is being conducted.</p>									
673	6/25/2001	KCS	CTC			KCS 685	B1 Relay	Page, OK	N
<p>Cause</p> <p>Failed Equipment or Device - Relay</p> <p>At 13:27hrs on 06/25/01, train #109824 North left the switch at North Page on signal indication traveling north. The dispatcher requested a follow up signal behind train #109824 for train 108224 to follow him north. At 13:37hrs on 06/25/01, train #108224 North with engines KCS685, KCS717, IMRL213, KCS2040, and KCS2034 with Engineer [redacted], and Conductor [redacted], and a consist of 34 loads, 47 empties, 5548 tons and 5192 feet, arrived at the north siding switch at Page, MP 353.9 with a Green over Red displayed for a north bound move. Train #108224 confirmed the location of train #109824 and realized he was only by the first signal north of Page at MP 351.8. Upon inspection by Signal Engineer [redacted], Signal Supervisor [redacted], and Signal Supervisor [redacted], we were able to reproduce the failure. We discovered that the north bound Yellow Green Repeater (12YGPR) relay at the first intermediate north of Page at Mile Post 351.8 was failing to drop out causing a Code 4 (Electrocode) to be transmitted south to the north switch at Page. There was no visible evidence for why the relay was hanging up. It would remain up even when gently removed from the plugboard. The information on the defective relsy is as follows: GRS B1, 300 ohm, D.C. Neutral, Drawing #56001-750 GR1, Serial #142277, manufacturer's inspection date is 5/14/53.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
327	7/3/2001	UP	CTC		ACS	UP 6869	None	Nevens, NE	N	
			Human Error - Improper Circuit Jumper in Place							
			On July 3, 2001 at 13:16 CDT, at Nevens, Nebraska on the South Morrill Subdivision, eastbound CNRWX 02, on the main track at MP 18.7, reported the eastbound signal WO18 displayed a Yellow aspect with the track east of Signal WO18 occupied.							
			An investigation revealed a loose terminal washer had caused a short in the BELOR relay that caused the AEHR relay to pick and display a Yellow aspect from eastbound signal WO18.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
674	7/4/2001	NJTR		Remote		N/A	Span/Rail Locks	Newark Drawbridge - "Broad" Interlocking, N	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			M&E train dispatcher reported signals indicated they went to STOP, rail locks not locked, and track circuit occupancy on both tracks at Newark Drawbridge with no trains present and no drawbridge opening requested. The lift rails were found in the raised position with the swing span unlocked and ready to open. With the emergency system the bridge was manually locked and the rails were lowered. The automatic drive system was disengaged and de-energized to allow safe movement of trains. Investigation revealed that the wedge and rail drive control system had become falsely energized by a faulty output from the programmable logic controller used to operate the drawbridge automatically. The drive control circuit was revised to include a physical contact of the signal master relay as well as the existing software interlock.							
308	7/5/2001	CSXT	AB			D750-05	Workmanship	Signal 1598, Sterling, OH	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			At 0845 hours on July 5, 2001, D750-05 train crew observed Signal 1598 displaying a CLEAR (G/R) signal while moving eastbound, following behind train K518-02, which was ahead in the second block. D750-05 stated that Signal 1598 stayed CLEAR for approximately 30 seconds before changing to an APPROACH aspect (Y/R). D750-05 train crew informed the train dispatcher of the signal incident and dispatcher informed the train crew to treat the signal as RESTRICTING. Signals were removed from service. Investigation revealed that the line overlay was not properly broken through the track relays, thus giving the improper signals. Design was notified and the proper wire breaks were designed, installed and tested. Signal system was restored to service.							
675	7/9/2001	CR	CTC				2N-2 Signal	Camden, NJ	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			2N-2 interlocking signal, governing northbound moves off the controlled siding at CP Mill on the Vineland Secondary, was reported to be displaying SLOW APPROACH when the signal on the main (2N-1) was displaying RESTRICTED. Investigation revealed wiring change was made to 2N-2 lighting circuit earlier and was not properly tested. Change was removed and signal tested without any other exceptions. Responsible parties involved were appropriately disciplined.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
676	7/11/2001	MNCR		Remote		Locomotive 105	On-Board Cab Signal Tester	CP233 - Stamford, CT	N
<p>Cause</p> <p>Failed Equipment or Device - Cab Signals</p> <p>Locomotive #105 received MEDIUM Cab Signal intermittently while approaching signal 1E at CP 233 at STOP, due to interference from the On-Board Cab Signal Test Unit of the locomotive.</p>									
328	7/13/2001	UP	CTC			UP0705	GRS SA Searchlight Mechanism	Houston, TX	N
<p>Human Error - Improper Circuit Jumper in Place</p> <p>On July 13, 2001 at 03:20 CDT, at Houston, TX on the Houston East Belt Subdivision, northbound YBS80-12, on 2 Tk at MP 5.40, received a Green aspect north of EB061 at northbound signal 52 into a Red aspect at northbound signal 57 at Wallisville Rd.</p> <p>An investigation revealed water in the SA Signal Mechanism at signal 57 causing the YGPR to pick, which sent a Code 4 back to signal 52, causing the Green aspect.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</p>									
292	7/25/2001	BNSF	AB			C ATMMAS1-03, E	Poleline	New London, Iowa	N
<p>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</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>									
677	7/27/2001	CP		Manual		CP 5653	Signal 3WB	Bryn Mawr Interlocking	N
<p>Scenario Reenacted, Unable to Duplicate, No Defects Found</p> <p>It was reported that signal 3WB indicated CLEAR (Green) for a call on move by crew of CP 5653. All data & info was retrieved & all tests performed. Indicated no defects. Please see following attachments [nothing attached].</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
293	7/29/2001	BNSF	CTC			SCWSLBP1 28	CL-5483	Amarillo, TX	N	
			Failed Equipment or Device - Electrocode Module							
			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.							
678	8/15/2001	ARR		Manual		4009		South Hurricane	N	
			Loss of Shunt - Possible Rust or Foreign Material on Rail							
			North bound absolute signal at South Hurricane displayed STOP indication. Train with engine 4009 moved past the signal to occupy the OS circuit and take the power operated switch on hand. After stopping with the lead truck in the OS circuit the power switch moved to the reverse position and the north bound signal indicated PROCEED. The engine had lost shunt in the OS circuit due to the presence of a foreign material on the top of the rails. The material was removed from the rails and the circuit tested to insure proper operation.							
329	8/15/2001	UP	CTC			BNSF 4486	None	Apache, AZ	N	
			Human Error - Signal, Improper Lenses Installed							
			On August 15, 2001 at 10:21 MDT, at Apache, AZ on the Lordsburg Subdivision, westbound CDGCO-14, on #1 Tk, reported the westbound approach signal on #1 Track at MP 1063.3 displayed a Yellow over Green aspect into a Red over Lunar westbound home signal at CP S1061, with his route lined from the #1 Tk on the Coal Lead Track.							
			An investigation revealed the lower colorlight lunar aspect at the westbound signal at MP 1063.30 had a green inner lens installed instead of a lunar lens.							
			The signal system was restored to proper operation, and all applicable tests were performed.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
313	8/16/2001	NS	CTC			9369	Signal "HD" Relay	Vansant, VA	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			At approximately 7:00 p.m. on 8/16/01, train U70U616, running westbound on Big Prater Branch, observed a CLEAR aspect on the 391 eastbound operative approach signal at MP BP 0.4. Signal was displayed into a de-energized OS track repeater circuit and displayed a STOP aspect on the 98R signal at Control Point Vansant. Investigation revealed the 391HD relay positive and negative signal wires had been swapped during trouble on 8/15/01 by assigned Signal Maintainer for this territory. The swapped polarities caused the 391HD relay (250 ohm polar relay) to pole normal displaying a CLEAR aspect when it should display an APPROACH aspect. Corrections were made and signal restored to service 8/17/01.							
294	8/21/2001	BNSF	CTC			M KCKIHB1 19, Eng	None	Ransom, IL	Y	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			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 LACNYCI 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.							
295	8/26/2001	BNSF	CTC			Z-KCKRIC1-26A M	Line Circuits were Wrapped	Kansas City, Kansas	N	
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)							
			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 System	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
296	8/31/2001	BNSF	CTC			NS-112-28, Engine		Kansas City, Kansas	N
			Phantom Signal - Due to Object in Foreground or Background						
			<p>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.</p>						
679	9/5/2001	URR		Remote		Engine 30	188 Signal	J Tower Interlocking, Duquesne, PA	N
			Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)						
			<p>On September 5, 2001 at approximately 11:00 AM, engine 30 reported an APPROACH MEDIUM aspect on signal 188 and a STOP aspect on signal 150. Upon arrival, Signal Manager [redacted] had the Union Railroad TMD (Dispatcher) request a signal on 188 and an APPROACH MEDIUM aspect displayed (Yellow over Green). The proper aspect should have been an APPROACH (Yellow). Signal 188 was taken out of service.</p> <p>Plant grounds were checked and found okay. Voltages were checked between case 27 and case 186. Cable 27-186A was meggered and had several bad conductors in the 19 conductor cable. This cable was last meggered on 12/1/98. A new 9 conductor cable was run and circuits were moved to the new cable. The new cable was meggered and all signal aspects were operationally checked. Signal 188 was put back in service.</p>						
680	9/6/2001	CP	CTC			CP6055E	45L Sig.	Buffalo, MN	N
			Failed Equipment or Device - Interior Wiring						
			<p>On 9/6/01 at 1933 hrs. train CP6055 East with Conductor and Engineer was moving thru Buffalo East Control Point, Conductor looked back at the westbound absolute signal and observed signal 45L displaying a Red over Yellow aspect. This signal should have been Red. Through investigation by Signal Supv and Signal Mtr, it was found to have the yellow light wire pinched under the nuts and washers of the red light wire in the jct. box of the color light head. The yellow wire was replaced and the balance of the other wires were inspected in all the signals at this control point. Signal 45L is a 4-position colorlight signal.</p> <p>Corrective Action: Mtrs to inspect all stackable colorlight heads to assure proper spacing and placement of wires. Review incident with all Suprv. And with construction crews review the proper procedures and practices when doing wiring in close confined areas.</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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330	9/10/2001	UP				UP4341	None	Templeton, CA	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

On September 10, 2001 at 15:42 PDT, at Templeton, CA on the Coast Subdivision, southbound QRVDO 10 on the main track reported the southbound signal at MP 216.4 was Green, and the next southbound signal at the North End of Templeton at MP 217.6 was Red.

An investigation revealed a line wrap at MP 217.0 that caused the Green signal at southbound signal at MP 216.4.

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

314	9/11/2001	NS	CTC			TR3529211	Phantom Signal	Leesville, VA	N
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Phantom Signal - Due to Object in Foreground or Background

At approximately 9:54 a.m. on 9/11/2001, Train TR 3529211, running eastbound on the siding at Amos Branch, MP V-210.0 on the Altavista District, Virginia Division, reported they had a CLEAR signal to leave the Amos Branch siding. Train TR 3529211 entered the siding at Control Point Huddleston, approached the control point at Amos Branch and stopped short of the eastbound control signal at Amos Branch which was displaying a STOP signal. At 9:54:43, TR 3529211 reported they had a CLEAR signal to leave Amos Branch. All signals at Amos Branch indicated STOP with switch normal to the dispatcher. The dispatcher had not requested the signal clear nor had the switch been requested reverse. At 9:54:55 TR 3529211 reported the signal at Amos Branch had changed to STOP after moving approximately 1 and 1/2 car lengths.

Initial review indicated a phantom aspect. Conditions were identical the next day, 9/12/01 at 9:45 a.m., and a phantom aspect was observed by C&S and Transportation personnel from the previous day's engine position on the eastbound control signal for the siding at Amos Branch. The STOP aspect was not visible and a reflection in the clear position was observed. The sun was to the left approximately 22-25 degrees from top 90 degree. It reflected off the top signal mast pinnacle and a cable junction box located below the background to give the appearance of two spots in the same general position as a CLEAR aspect. Signals in question are color position light signals. Lamps were set at 6.9 volts with 25 watt bulbs.

To correct the situation, signals have been refocused, 20 watt bulbs installed and voltage raised to 8.0 - 9.2 VDC on all signals at CP Amos Branch. Cable junction box was rotated so sunlight would not reflect toward oncoming train.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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331	9/12/2001	UP	CTC			UP6822	None	Kress, IL	N
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Vandalism - Cable Damaged by Digging

On September 12, 2001 at 01:48 CDT, at Kress, IL on the Geneva Subdivision, westbound CMHVC 12, on track #3 at MP 32.1, reported their cab signal cleared for their train on track #3, when the westbound signal on track #2 was CLEAR (cab signals on track #3 should display RESTRICTING when westbound train is cleared on track #2).

An investigation revealed that required track wires were still connected to tracks #2 and 3. These wires were shorted together while performing directional boring, and fed cab signal energy intended for track #2 to track #3.

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

315	9/18/2001	NS	CTC			P83P918	Signal "HD" Circuits	Charlotte, NC	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

At approximately 4:40 p.m. on 9/18/01, Train P83P918, running southbound on Track #1 approaching the control point at North Advance, MP 379.6 on the Piedmont Division observed a DIVERGING CLEAR aspect on the southbound control signal. This was after receiving a RESTRICTING aspect at the approach signal at Summitt Avenue, MP 378.4. They were anticipating a STOP signal at N. Advance due to an occupied block indication between N. Advance and Charlotte Jct., MP 380.6 for Track #1. Switch was requested and indicating normal at N. Advance.

Investigation revealed that the track circuit between N. Advance and Charlotte Jct. for Track #1 was a center fed DC track circuit with two track relays. One on the north end of the circuit and one on the south end. "HD" information for N. Advance is sent from Charlotte Jct. to N. Advance in a multiconductor cable between the two control points.

A track production gang had worked track between Charlotte Jct. and N. Advance earlier that day and caused track leads for the south track relay at Charlotte Jct. to open, de-energizing the relay. Contacts of the relay were in the indication circuits and indicated an occupied block. However, they were not in the 227LBHD circuit and did not de-energize this circuit. Dispatcher had requested a follow-up move at N. Advance. The 227LBHD relay was energized and allowed the DIVERGING CLEAR (Red/Green/Red) to display.

Circuits were corrected adding contacts of the 221RT track relay in the 227LBHD circuit to open the circuit with the track relay deenergized.

The corrections were implemented and tested on 9/19/01.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
297	10/22/2001	BNSF	CTC			MGALCNI1-22, Eng	None	Verona, Illinois	N	
			Maintenance - Rodent Nest in Signal Apparatus							
			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.							
681	11/1/2001	MRL	CTC				Phantom Aspect	Helena, MT	N	
			Phantom Signal - Due to Sun Angle							
			See attached [nothing attached].							
298	11/5/2001	BNSF	CTC			CMCMJCC324A, B	2LA Signal	Defiance Wye Spur, MP .6, Defiance Sub., Ga		
			Insufficient Information in Report to Assign Cause							
299	11/15/2001	BNSF	CTC			L TWI8101 15	SA-1 Signal Mechanism	Minneapolis, MN MP 16.3, Control Point		
			Failed Equipment or Device - Relay							
682	11/21/2001	CR	AB			NS69T, 5412	143 SIS	Detroit Line	N	
			Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)							
			Train NS69T engine 5412 reported signal 143 at CLEAR G/R and interlocking signal at FN Tower STOP R/R. Upon investigation, a maintainer found a pole down and tried to straighten it. In doing so, we believe he cleared a line wrap, which caused the HD relay to be falsely energized. When the supervisor arrived on the scene, he tried to recreate the problem, but he could not.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
332	11/28/2001	UP	AB			BNSF 4742	Electrocode II Unit	Palestine, AR	N	
			Failed Equipment or Device - Electrocode Module							
			On November 28, 2001 at 17:22 CDT, at Palestine, AR on the Brinkley Subdivision, westbound QMECVJ/28, on the main track at MP 51.90, reported that the westbound signal at MP 51.90 was Flashing Yellow, and the next westbound signal at MP 51.00 was Red.							
			An investigation revealed that the 5K module in the Electrocode II unit at the westbound signal at MP 51.90 was intermittently failing causing the HD relay to pump causing the signal to display a Flashing Yellow.							
			The signal system was restored to proper operation, and all applicable tests were performed.							
683	12/2/2001	KCS	CTC			KCS 685	Vandalism	Jaudon, MO	N	
			Vandalism - Signal Damaged, Caused Unintended Signal Aspect							
			At 14:21hrs on 12/2/01, train #RUN8, (IFG Local), with Engineer and Conductor, with a consist of 0 loads, 20 empties, 800 tons and 2169 feet was in the siding at the south siding switch at Jaudon waiting on a meet with train #000230, (KCSH North), with Engineer and Conductor, and a consist of 21 loads, 15 empties, 2813 tons and 2281 feet. RUN8 was aware of the meet and was told that the north bound train #000230 was lined north up the main line by the siding switch. The crew on RUN8 notified the signal desk that the trailing signal out of the siding was displaying a Lunar (RESTRICTED signal). This location is not capable of displaying a Lunar. Upon investigation of the report by Signal Maintainer [redacted], it was discovered that the SA mechanism had been vandalized, shot by a rifle which knocked out the red lens but didn't break the bulb.							
333	12/2/2001	UP	CTC			Unknown	None	Redding, CA	N	
			Phantom Signal - Due to Object in Foreground or Background							
			On December 2, 2001 at 15:30 PST, at Redding, CA on the Valley Subdivision, an unknown southbound train on the main track at MP 286.90 reported that the intermediate southbound signal at MP 286.90 displayed a Yellow over Yellow aspect with the next southbound signal at North Lakehead displaying a Red aspect.							
			An investigation revealed that the ditch lights, on high beam on a new Comfort Cab, were refracting off the lower ("B") head of the southbound signal at MP 286.90 causing a washed out Yellow aspect.							
			The screen has been installed on the signal and the signal system was restored to proper operation, and all applicable tests were performed.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
684	12/10/2001	CP		Manual		Amtrak 41, CP 605	2R Signal	Milwaukee, WI	N
<p>Cause</p> <p>Insufficient Information in Report to Assign Cause</p> <p>See attached [nothing attached].</p>									
309	12/14/2001	CSXT	CTC				Train Bulletin	Crandle Road, Walbridge, OH	N
<p>Cause</p> <p>Human Error - Incorrect Bulletin Provided to Train Crew</p> <p>At 1500 on December 14, 2001, Supervisor responded to a report that the signals at Crandle Road indicated MEDIUM APPROACH indication (R/Y/R) over a #10 turnout when lined over the #1 crossover. The northbound signal on #2 track and the southbound signal on #1 track were removed from service. Verified the aspects and found a Detroit Division General Train Bulletin issued at 0001 on 10/01/01 incorrectly stating the signals at Crandle Road are Seaboard-style signals and are to be governed by CSX signal rules 281 through 296 and should have been Chessie-style signals covered by CSX Rules C281 through C296. The signals were restored to service at 1715.</p>									
685	12/17/2001	CN	CTC			CN 5780	Approach Signal	Flint, MI	N
<p>Cause</p> <p>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</p> <p>At 02:00 on 12/17/01 eastbound train with leading engine CN 5780 had an APPROACH MEDIUM aspect at signal 2676 on the Flint Subdivision, this aspect was less restrictive than APPROACH aspect the engine crew should have received. When investigating the cause of the discrepancy, it was found that two line wires had come in contact with each other at MP 269.27 (Pins 4 and 5). This failure caused voltage to be present on the "B" mech. Control coil.</p> <p>Corrective action was taken by separating the line wires, and making repairs to pin 5.</p>									
686	12/27/2001	IMRL	APB			MRL 265	None	Savanna, IL	N
<p>Cause</p> <p>Insufficient Information in Report to Assign Cause</p> <p>See attached [nothing attached].</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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346	12/31/2001	CSXT	CTC			NS 6688	Insulated Joints	High Bridge, KY	N
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Failed Equipment or Device - Insulated Joint(s)

On 12/31/01 at 2:10 a.m., Central Division Train #50VT830, lead unit NS 6688, proceeding southbound on Track #1 at High Bridge, KY, observed the home signal at High Bridge Control Point, MP-102.5, to display a CLEAR aspect for the train's movement. The signal should have displayed an APPROACH aspect due to the signal in advance, located on Track #1 at Control Point Brown MP-105.0, displaying STOP aspect. Train #50VT8 was aware of the dispatcher's plan for a meet with an opposing train at Brown and was able to stop the train short of the home signal at that location.

Investigation revealed that the track circuit on #1 track between High Bridge and Brown had the presence of foreign AC current on the rail. This allowed the track relay at High Bridge to intermittently pickup, and energize the decoder and associated relay pertaining to the CLEAR aspect. The presence of foreign current was attributed to two defective insulated joints on #1 track at High Bridge, one being shorted and one having low resistance.

As a corrective measure, both insulated joints were replaced. As an additional precaution, 60 cycle reactors were installed on the involved circuit at both High Bridge and Brown. The signal system was tested and returned to normal service at 4:15 p.m.

316	12/31/2001	NS	CTC			NS 6688	Insulated Joints	High Bridge, KY	N
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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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357	1/17/2002	NS	CTC			NS 5512	Track Isolation Unit	Seneca, NY	N
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Failed Equipment or Device - Track Isolation Unit

On January 17, 2002 at 3:15 a.m., Harrisburg Division train 17H, lead unit NS 5512, southbound on the Ebenezer Running Track at Seneca, New York, reported signal 39E at MP 3.9 display an APPROACH aspect for the train's movement. This signal should have displayed a RESTRICTING aspect due to a hand throw switch ahead in the block being in the reverse position.

Train 17H's crew was aware of the switch being left in the reverse position by the crew of a previous train movement, and therefore train 17H proceeded at Restricted Speed and stopped short of the hand throw switch lined against their movement.

Investigation revealed that the B1-1T track circuit in advance of the 39E signal had a track isolation unit with an open resistor and shorted diode. This condition allowed the track isolation unit to discharge its capacitor through the 39HR relay during the entire duration of its discharge time, which prevented the relay from dropping out while the hand throw switch was in the reverse position.

The track isolation unit was replaced and signal restored to normal service at 2:50 p.m.

334	1/22/2002	BNSF	CTC			Unknown	Signal	Phillipsburg, TX	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

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.

687	2/13/2002	CORP	AB			CORP 3819	Aerial Cable	MP 550.4, Myrtle Creek, OR	N
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Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)

The CORP 3819 was northbound at Myrtle Creek on 2/13/02. The crew reported a Dark signal at 550.4 and 551.2. While passing 551.2 they looked back at signal 551.3. 551.3 was showing an APPROACH while train was still occupying the block which it governed. I responded immediately and began shunting track circuits. I discovered the track relays were de-energizing, but the 5513HR and 5505HR would not de-energize. After checking the rints and pole line, I concluded that the aerial drop cable to signal 550.4 was shorted out between the 5513H and 5505H circuits. I set both the 5505 signal and the 5513 signal to their most restrictive aspects and informed dispatch. The next morning, myself and [ends in midsentence].

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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358	2/17/2002	NS	CTC			NS 9003	Relay Circuit	Matewan, WV	N
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Failed Equipment or Device - Interior Wiring

At 12:42 a.m. on 2/17/02, train U72U616 received a westbound APPROACH aspect on the 8LR signal at Control Point Ought-One, MP N445.5 on the Pocahontas Division, when the 8LR signal located at MP D0.6 should have displayed a STOP aspect.

The problem was duplicated during testing and found to be a foreign voltage on the LC08H relay, falsely energizing the relay which allowed the Yellow aspect to be displayed on the "A" signal head. Signal 8LR is a color light signal. The short was found in the LC08H circuit in the main shelter at CP Ought-One. This is a TC Green wired bungalow and a TC Green wire had shorted to local battery. The defective wire was replaced in the circuit, eliminating the foreign voltage. In addition, the location is scheduled to be upgraded to new electronic equipment in March, 2002.

689	2/26/2002	MRL	CTC			BNSF 1016	None	Eddy, MT	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

On February 26, 2002, Engineer on train XPASABE123 reported that while approaching eastward intermediate signal 240, the signal was first observed as displaying a Green aspect, then the signal was observed as displaying a Flashing Yellow aspect. The proper aspect for signal 240 at this time was Flashing Yellow account the eastward absolute signals at East Eddy were Red.

Signal Department personnel promptly investigated this incident. Personnel checked the electronic log reports for the HLC equipment at East Eddy and West Eddy which revealed the signal system was functioning as intended. Personnel checked the electronic data log reports for Digicon, which revealed the system was functioning as intended. Personnel checked the electronic data logger report the the Electrocode equipment at signal 240, which revealed the signal system was functioning as intended with signal 240 displaying a Flashing Yellow aspect at the time of the occurrence.

Signal Department personnel also performed operational tests, performed relay tests, megging tests, tested relays, performed ground tests and inspected wiring. Subsequent to tests, signal system functioned as intended.

Signal Department personnel were unable to duplicate this alleged false proceed incident. All tests and inspections revealed the signal system functioned as intended.

347	2/27/2002	CSXT	CTC			R27627	None: Phantom	NAS Contentnea #2 Tr., Contentnea, NC	N
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Phantom Signal - Due to Sun Angle

On February 27, 2002 at about 1545 hours the crew of K27627 reported a RESTRICTING signal (R/R/L) at the NAS Contentnea, NC Number 2 Track at MP A139.0. Investigation revealed that the signal was working as intended and the RESTRICTING aspect was due to being sunlit and was verified as a phantom aspect. The signal backgrounds were painted, outer lens replaced and realigned signal to the apex of the curve. Phantom screens were ordered and will be installed upon receipt. After the mitigating action the signal was rechecked under similar conditions and now exhibits no aspect exceptions. We are reporting this event but we do not consider this to be a false proceed.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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688	3/2/2002	CORP	AB			UP 2459	Semaphore Arm	MP 617.4, Curtin, OR	N
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Failed Equipment or Device - Semaphore Signal

0332 AM, March 2, 2002

The southbound 501, UP 2459, heading to Roseburg, passed semaphore signal 617.5. The engineer looked at the opposing signal, 617.4, and noticed that it was displaying a Yellow indication.

Upon arrival and inspecting, the signal relays, track relays and slot coil were energized, and signal 617.4 was still displaying a Yellow indication.

Upon further inspection to signal 617.4 the buffer for the 617.4 semaphore arm was immovable, held stationary, in its Red position. Inspecting the buffer the grease was stiff, to the point of being frozen. The buffer and buffer chamber were cleaned and new grease installed.

Signal location was then tested with shunts and train movement observed.

Weather conditions for the day of March 02, 2002: frost with patches of ice, outside temperature 33 deg.

335	3/12/2002	BNSF	AB			RNCA 0023-12A	None	Maltby, CA	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

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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348	4/9/2002	CSXT	CTC			H75709	Aerial Cable	W.E. Gordonsville, Gordonsville, VA	N
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Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)

At 18:25 on April 9, 2002 H75709 was operating westbound in the siding at the west end of Gordonsville. The switch was lined reverse and the westbound dwarf signal displayed a SLOW CLEAR (G) for the train to leave the siding. The train crew then observed a CLEAR (G/R) signal westbound on the main at the west end of Gordonsville. This signal should have been at STOP. H75709 stopped and reported the incident to the dispatcher. The signals were immediately removed from service and signal personnel were dispatched to the location. Upon arrival, Signal Supervisor and team verified this condition. Further investigation revealed foreign battery applied to the H-D line circuits causing the signal on the main to incorrectly indicate CLEAR. The line circuits were opened and the signals in both directions at the west end of Gordonsville were left out of service until repairs completed. Investigation revealed the aerial cable at the West End of Gordonsville junction box showed signs of moisture and corrosion. The affected aerial cable was removed from the junction box and the terminal strips were cleaned. Some of the conductors were cut off and the cable was reterminated. All conductors passed the megging test to ground and the cross megging test. The aerial cable was then restored to the signal system. Operational tests were performed with no exceptions taken. Signals were restored to 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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336	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.

349	5/5/2002	CSXT	CTC			Q68905	None - Phantom	N.E. Osierfield, Osierfield, GA	N
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Phantom Signal - Due to Sun Angle

At about 17:40 hours on May 5, 2002 train Q68905 reported an APPROACH signal at the N.E. Osierfield for about 5 to 8 seconds with a train in the block ahead. Investigation revealed that the signal was working as intended and the APPROACH aspect was due to being sunlit and was verified as a phantom aspect. Individual hoods were installed on each affected signal. After this mitigation action the signal was rechecked under similar conditions and now exhibits no aspect exceptions. We are reporting this event but we do not consider this to be a false proceed.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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338	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.

690	5/14/2002	CN	CTC			IC 1116	SB Signal, Trk 1, Skip	St. Charles, LA	N
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Failed Equipment or Device - Electrical Ground (not in underground or aerial cable)

Signal Supervisor was notified at 20:15. M320 train reported a false proceed at Skip. The approach signal to Skip was APPROACH DIVERGING and went to APPROACH then back to APPROACH DIVERGING. The signal aspect at Skip was Red over Flashing Red, then to a DIVERGING CLEAR, and back to Red over Flashing Red. Crew M320 knew that TL James crossover was Red lined against his movement, due to an empty grain train going through to track 2.

The Supervisor and Inspectors arrived at Martin Jct. and the signal was Red over Red over Red. They checked for grounds on the battery busses and found a 12mA negative ground on the B12 buss with AC power on, with the AC power off it read 500 mA. They lined the switch on track one for the TL James crossover Red. The Code 2 was lost going to Skip on the EC 4H unit, sending only a Code 1 and 5, but every few seconds the Code 4 would light up and stay on about 6 seconds then drop back out.

The ground was on 5RC and 5RA signal head. Any time the 5RALOR relay was down it would not produce a Code 4. If the 5RALOR was up with the 5RCEN or 5RCRE off it would not produce a Code 4. With a switch lined you dropped out the ANWPR which dropped the 1NBPR that took the path away from your reference to Code 4 with the relay down. The negative 12mA ground was making the unit think it needed to send a Code 4 out, which was why the DIVERGING CLEAR was falsely produced at Skip. It should have been a RESTRICTING signal, Red over Flashing Red because TL James crossover was lined Red. The cable to the 5R signal was megged. They found the 5RAEN and 5RCEN grounded. The signal heads were removed and the wires were repaired. They megged and tested the signal system, and it was placed back in service at 14:30, 5/15/02.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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692	5/17/2002	AMTK		Automatic			Switch Detector Locking	Chicago, IL	Y
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Human Error - Improper Circuit Jumper in Place

On May 17, 2002 at approximately 8:30 AM-CT METRA Commuter train 2116 operating in a shoving move with 2 locomotives and 9 cars derailed the lead locomotive at the switch (37-MPF) entering track number nine. There were no injuries to passengers or crew. Investigation determined that the (37-MPF) switch had been thrown normal while the last locomotive was traversing over the switch. Investigation revealed that a 39-foot section of rail located between the N37 switch and the R40 signal had been removed to facilitate the replacement of long switch ties on track two. This rail removal caused the 37-track circuit to be down and the 37 & 39 switches to be detector locked. Engineer C&S revealed that jumpers had been applied bridging contacts in the 37 & 39 switch lock circuit, which disabled the switch locking circuits on the 37 & 39 switches. This condition allowed the train director to throw the 37-switch under the METRA train. This accident caused considerable damage to the interlocking infrastructure (Track & Signal) and on-board equipment which was estimated at \$30,000 cost. Track and signal restoration was completed by 2-PM on Sunday, May 19, 2002. Record of jumper permission was found in [redacted] office per AMT-23, section number eight that indicated that [redacted] authorized the jumper to be applied (copies attached). This accident was caused by an employee failing to follow proper procedures in the application of jumpers, per Amtrak AMT-23 Rules number 300 thru 304 & 407. Rule number 302 reads: "The guiding principle at all times must be that any protection temporarily defeated by the jumper must be provided by some other means until the removal of all jumpers is assured and original protection is restored." Rule number 407 which reads in part "... When necessary to disconnect or impair the function of locks, circuits, or other safeguards in an interlocking, all switches affected must be safely secured before any train or engine is permitted to pass over them..." [redacted] failed to ensure that protective measures were in place. The Division Engineer has indicated to this writer that the events that caused this incident are not normal procedure. He has initiated new procedures for the application of jumpers that require his or [redacted] the Manager C&S authority. He has also scheduled instructional meetings with C&S employees to re-enforce jumper procedures, as well as checking C&S employee AMT-23 & 27 qualifications. He has also discussed discipline against [redacted] (who has accepted full responsibility for this accident), and is requiring [redacted] to meet with all C&S employees to discuss his involvement in this accident. The C&S system office will be issuing an advisory on the use of jumpers and attaching a paper copy of the Electronic Jumper Permission Log currently in use on the Northeast Corridor for distribution to other areas of the Amtrak system.

350	5/17/2002	CSXT	CTC			Q69617	None - Phantom	Monroe, NC	N
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Phantom Signal - Due to Sun Angle

Train Q69617 arrived at Monroe from Charlotte at about 1800 hours. Dispatcher is lined for a mainline move at the north end of Monroe but will put signal to STOP and route Q69617 NB out of the siding onto #1 track. The Engineer on Q29217 states he called the signal as a SLOW CLEAR and as he approached the switch it was lined for main so he stopped train and reported incident to the train dispatcher. Signals were removed from service and signal personnel dispatched to the site. Investigation revealed that the signal was working as intended and the SLOW CLEAR aspect was due to interference from the sun and was verified as a phantom aspect. Individual hoods were installed on the affected signal and phantom reducing screens were installed. After this mitigating action the signal was rechecked under similar conditions and now exhibits no exceptions. We are reporting this event but we do not consider this to be a false proceed.

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.

691	5/27/2002	KCS	CTC			KCS 685	Vandalism	Watts, OK	N
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Vandalism - Signal Mechanism Shot - Stuck in Position

At approximately 23:25hrs on 05/27/02, train 108227 (#82), with Engineer and Conductor, with a consist of 51 loads, 17 empties, 6532 tons and 4251 feet, with engines KCS 4509, KCS 669 and BNSF 9873 was traveling northbound on the main track at North Watts, Mile Post 234.30 on the Heavener Subdivision, Mid Continent Division. As the train approached North Watts the crew reported that the northbound main line signal and the trailing signal out of the siding were both displaying a CLEAR (Green). Upon investigation of the report by the Signal Supervisor, it was discovered that the SA mechanism in the trailing siding signal had been vandalized, shot by a rifle, which caused debris to hang the mechanism in a position to cause it to display a Green.

Please see attached Call Desk trouble ticket, a statement of facts from [redacted], a train report and a Station report for North Watts.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
359	5/30/2002	NS	CTC			560C329	Human Error	CP-207, Elyria, OH	N	
			Human Error - Signal Personnel Introduced False Energy into Signal System During Testing							
			On Thursday, May 30, 2002 at 11:00 a.m., Dearborn Division train 560C329, lead unit NS 9451, westbound on track 2 at MP-CD205.7, reported intermediate signal 205-2W to display a CLEAR aspect for its movement. This signal should have displayed an APPROACH aspect due to the next signal, the 2W home signal at CP-207, displaying a STOP aspect account train 15JB129 ahead in the block.							
			Train 560C329 was aware of a train ahead in the block and therefore stopped short of the 2W signal at CP-207.							
			Investigation revealed that a signal testman was performing relay testing at CP-207 at the time of the incident. The maintainer performed testing on the 2WAHR relay during the time that train 15JB129 was in the block, which involved false battery being applied to this relay. Testing on this relay had been performed without obtaining the proper track time authority, and without appropriate measures taken to insure safety of train movements.							
			Dispatcher logs indicate that the 2W home signal displayed a permissive aspect without being requested, and remained in that state for 41 seconds. Tests after the incident proved that the 205-2W signal would display a CLEAR aspect when false battery was applied to the 2WAHR relay at CP-207.							
			The signal system was tested for proper operation and restored to normal service at 2:00 p.m.							
340	6/2/2002	BNSF	CTC			ZKCKLAC1-01	None	Clovis, NM	N	
			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.							
695	6/15/2002	FEC	CTC			415, Train #10115	Grounded Cable	Delray Beach, Florida	N	
			Failed Equipment or Device - Aerial or Underground Cable, Shorted or Grounded (not due to vandalism or digging)							
			See attached report dated June 21, 2002. [no report attached]							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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696	6/18/2002	CP		Remote		CSXT 7911	CL	Portage, WI	N
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Cause

Narrative

Phantom Signal - Due to Sun Angle

After changing the outer clear plastic lens to a glass outer clear lens, the signal maintainer failed to secure the lunar CL head. Train 614 (CSXT 7911) was on the siding at Portage Jct. The train was about 10 cars west of 2EA signal when they observed what they thought to be a DIVERGING CLEAR aspect. Train 614 passed the signal and stopped short of a power switch lined against them.

We are reviewing FRA Rule 236.3 (locking of signal apparatus housings) with all concerned.

693	6/20/2002	KCS	CTC			KCS 685		Monticello, TX	N
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Human Error - Signal Equipment Improperly Installed

At approximately 11:45hrs on 06/20/02, train #060819 (INSATLA), with Engineer and Conductor and a consist of 24 loads, 0 empties, 6233 tons and 5685 feet, with engines ATSF 0693 and BNSF 4885 was traveling westward on the main track at East Monticello, Mile Post 101.0 on the Greenville Subdivision, Transcontinental Division, where he received a CLEAR (Green) aspect to proceed westward. As the train approached West Monticello, Mile Post 102.4, the crew reported that the westbound main line signal was Dark. Upon investigation of the report by the Signal Inspector, who also witnessed the Dark signal, it was discovered that there was a back nut behind the EN battery strap that was loose. [redacted] had been wiring in a recorder at this location when he was notified to give up his track authority and clear for a train.

Please see attached Call Desk trouble ticket, and a Train report for the train affected.

694	6/21/2002	CN	AB			IC 6124	Signal 415.4	Gramercy, LA	N
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Maintenance - Switch Fouling Wires Missing, Broken, or Ineffective

IC train 316 on June 21, 2002 reported a false aspect at signal 415.4, Gramercy LA, Baton Rouge Subdivision. The switcher was shoving cars in the north end of Mt. Airy siding. When the switcher cleared the switch and was in the fouling section, the switch was then lined back for the main and signal 415.4 went to Green. Upon arrival the Inspector found both 15' fouling wires broken. The fouling wires were repaired. The signals, fouling and switch circuit were tested.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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697	7/2/2002	CP		Manual		730 Transfer	Sig. 5EA/5EB	Milwaukee, WI	N
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Human Error - Signal Equipment Improperly Installed

Switch engine (730 Transfer) with Engineer [redacted] and Conductor [redacted] sitting on #3 track at Merrill Park just west of the EB absolute signal (5EB) governing movement into Cutoff Interlocking. The crew requested the signal (5EB) to proceed east from Merrill Park #3 track with the hand throw switch lined for their route into Cutoff Interlocking. The signal (5EA) governing movement from Merrill Park #2 track into Cutoff Interlocking cleared which is not correct. When the hand throw switch is lined reverse, the signal (5EA) governing movement from Merrill Park #2 should clear when requested. When the hand throw switch is lined normal, the signal (5EB) governing movement off Merrill Park #3 should clear when requested.

It was found that the switch circuit controller on the hand throw switch for Merrill Park #2 and #3 tracks was adjusted incorrectly causing the wrong signal to clear.

A formal investigation is scheduled to determine facts and place responsibility for this incident.

698	7/6/2002	CN	AB			CN 2528	CLS-20	Greendale, IL	N
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Maintenance - Wiring Chewed by Rodents

A southbound train, CN2528 was holding in siding at South Greendale, a spring switch Electrocode style end-of-siding. As a northbound train approached South Greendale, the train crew on CN2528 observed the signal on the southbound trailing main, which should have been displaying Red was displaying a Yellow. The Signal Supervisor was notified and South Greendale was removed from service. While investigating the southbound absolute signal on the trailing main track, it was discovered that mice had been in the signal mast. They had eaten away the insulation on the pullman light wires and the red wire had deteriorated and the yellow light wire shorted to the remains of the red causing the yellow to illuminate instead of the red. The pullman wire was replaced, the signal mast was re-sealed to keep the mice out, and the signal location was tested and placed back in service.

365	7/19/2002	UP	AB			NS 8971	None	Fairbanks, TX	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

On July 17, 2002 at 08:30 CDT, at Fairbanks, TX on the Eureka Subdivision, northbound MHOFW 19, on the main track at MP 7.60, reported that the northbound signal at MP 6.70 was Green, and the next northbound signal at MP 7.6 was Red.

An investigation revealed that a line wrap which caused the signal at MP 6.70 to be Green rather than Yellow.

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

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
351	8/14/2002	CSXT	CTC			K650-13	Relay	St. Stephen, NC	N	
			Human Error - Signal Equipment Improperly Installed							
			At 0630 on August 14, 2002, train crew report on K65013 while operating northbound on the single main track to #2 track over a reversed switch, observed and reported a CLEAR indication (Green) at the intermediate signal MP A355 and a LIMITED CLEAR (Red over Flashing Green) at South St. Stephen when the intermediate signal should have displayed an APPROACH LIMITED (Yellow over Flashing Green). The signals were removed from service at 0645 and a team was dispatched to the site to investigate this event. Investigation revealed that the RHHR relay, a DN-11 style shelf relay, had vibrated off the shelf and was found inverted, hanging by the wires in the equipment house at St. Stephen which caused a signal to be displayed at the intermediate signal indicating better than conditions warranted. The relay was up righted and an anti-vibration assembly was installed. Complete operational tests were performed with no exceptions taken. Signals were restored to service at 1100 on 8/14/02.							
352	8/15/2002	CSXT	CTC			Q579-14	None - Phantom	S.E. Hurricane, Bay Minette, AL	N	
			Phantom Signal - Due to Sun Angle							
			At 8:40 AM on August 15, 2002, southbound Q579-14 reported a MEDIUM APPROACH from siding to main track at the South End of Hurricane (Red/Yellow) while the switch was lined for the main track at the South End of Hurricane. Signals were removed from service and Train Control personnel conducted an investigation revealed that the 59C Dwarf Signal appeared sunlit. 18 inch hoods and a vandal proof cover were installed. Signals were restored to service on 8-16-02. We are reporting this event but we do not consider this to be a false proceed.							

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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700	8/22/2002	MRL	CTC			BNSF 5447	Switch Machine	Reed Point, MT	Y
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Maintenance - Worn Components Not Replaced Prior to Incident

On August 22, 2002 at approximately 10:29 hours, eastward train UP 4978, train symbol ESPBDM029, derailed 3 locomotives and 16 cars at West Reed Point. Engineer on train ESPBDM029 reported that he observed the eastward absolute signal at West Reed Point as displaying a Green over Red aspect with the switch points for the West Siding Switch open. Train ESPBDM029 split the switch and derailed 3 locomotives and 16 cars.

Preliminary investigation by Signal Department personnel revealed the absolute signal at West Reed Point was displaying a Green over Red aspect with the switch points open as reported by the Engineer on train ESPBDM029. At the time the derailment occurred, the point detector rods was broken and the switch was indicating in the normal position with the switch points gapped open along with bent switch rods.

Signal Department personnel revealed the cause of the failure to be a combination of a broken point detector rod, a missing wear plate under the lock rod on the field side of the GRS Model 5D switch machine and wear under the lock rod on the field side of the switch machine frame. The wear plate was found in the bottom of the switch machine with a broken pin that secures the wear plate in place under the lock rod on the switch machine frame.

The missing wear plate which was 0.093" thick and 0.028" wear on the frame of the switch machine permitted the lock rod to sit 0.121" lower in the switch machine than normal. This resulted in permitting the point detector yoke to move an additional 1/16" before resting on top of the lock rod clips. This was enough movement to permit the point detector to indicate in the normal position with the switch points in the reverse position.

Furthermore, it was determined that the west siding switch had been run through by two westbound trains prior to the derailment. Westward train BNSF 5447, train symbol VKCMTAC820 ran through the switch at approximately 7:42 hours. At this time the switch points were lined for the reverse position and indicating in the normal position. Westbound train BNSF 4398, train symbol HKCKPAS119 also ran through the switch at approximately 7:56 hours. Both trains were on the Main Track and the westward signal for the Mian Track at West Reed Point displayed a Green signal aspect for both trains. Neither train crew reported a signal failure at West Reed Point prior to the derailment. The train crew on train VKCMTAC820 did notify the Dispatcher after hearing about the derailment and reporting that they thought the switch was lined against them at West Reed Point but they were not positive so they didn't file a report.

Signal Department personnel replaced the switch machine at West Reed Point and have checked the wear plates and performed a switch point integrity test on all power operated switch machines on Montana Rail Link.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
699	8/24/2002	CN	APB			Rail Grinder	Signal 2EA	Round Lake Beach, IL	N	
			Failed Equipment or Device - Loose Components							
			On Sat. Aug. 24, 2002 at Round Lake Beach, IL at 1845 a false proceed signal was observed by the crew on the Railgrinder.							
			The Rail Grinder on the #2 Main had a CLEAR signal for the #2 Main (Signal 2EB lined to converge). The switch was lined reverse for a move from #2 Main to Main Track. The rail grinder observed that the SB signal on #1 Main (Signal 2EA) appeared to be a Flashing Red aspect.							
			Upon arrival, signal maintainer observed erratic flickering of Red to Dark on signal 2EA.							
			After investigation supervisor found the plug strip behind lamp module was pushed back and loose from its anchor point. Module plug was secured and module was reseated tightly.							
353	8/30/2002	CSXT	CTC				None - Phantom	S.E. Gorman, Gorman, TN	N	
			Phantom Signal - Due to Sun Angle							
			At 10:30 AM 8/30/02, received report of a CLEAR indication (Green over Red) on the S.B. Dwarf signal at the SE Gorman without a signal requested from the Operations Center as verified by the system log. Signal was removed from service and investigated by Train Control. Investigation revealed that the signal appeared to be sunlit. The affected signal head was replaced, operational tested and restored to service. We are reporting this event but we do not consider this to be a false proceed.							
366	8/30/2002	UP	CTC			BNSF 4432	None	Norden, CA	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			On August 30, 2002 at 21:27 PDT, at Norden, CA on the Roseville Subdivision, westbound 1QDVST 27, on track 1 at MP 191.20, reported that the westbound absolute signal was Red over Green, with the crossover switch on track 1 lined normal and the crossover switch on track 2 lined reverse.							
			An investigation revealed wiring errors in the crossover switch on track 1.							
			The signal system was restored to proper operation, and all applicable tests were performed.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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367	9/3/2002	UP	CTC			CNW 8817	None	Platteville, CO	N
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Loss of Shunt - Possible Rust or Foreign Material on Rail

On August 30, 2002 at 21:27 MDT, at Plattville, CO on the Greeley Subdivision, southbound CCSBR1-31, on the siding at MP 33.80, reported that the signal out of the siding at CP W034 went Green and then Red with the main track south occupied.

An investigation revealed the train occupying the main track south of CPW034 was a single 4 axle locomotive, and that the CTC log had recorded a momentary loss of shunt.

All applicable tests were performed.

701	9/6/2002	CP	CTC			SOO 2032W	Insulated Joints	Brooten, MN	N
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Failed Equipment or Device - Insulated Joint(s)

About 1330 on September 6, 2002, Engineer [redacted] told the S&C Supervisor [redacted] at Glenwood that there may be a problem with the signal at MP 104.5 near the West House Track at Brooten, MN. Engineer [redacted] stated they stopped with a westbound wayfreight on September 1, 2002 about 1600 east of signal 104.5, cut off their train with 3 engines and two cars then proceeded west to the west house track switch. They reversed the switch and backed into the house track far enough to set out the cars and thought the signal 104.5 appeared to displayed a CLEAR aspect with the house track switch lined reverse.

S&C Supervisor [redacted] proceeded to the site and simulated the train move. He found by simulation when the west house track switch was open, signal 104.5 displayed a CLEAR aspect. Further investigation revealed the house track switch was wired per plan breaking the track circuit through the switch circuit controller with the polarity the same on both sides of the insulated joints with TJs around insulated joints for the warning devices on CSAH-18 (Central Ave.) and both insulated joints were shorted.

Method of train operation is freight with maximum speed of 60 MPH for expedited trains and all others 50 MPH in CTC territory on the Paynesville Sub.

Cause of failure was due to insulated joints shorted.

Corrective action taken: Temporarily switch was taken out of service with a shunt circuit wired in the circuit controller until insulated joints were changed out. All switches were inspected following this incident and any switches found to have two insulated joints breaking the track circuit through the switch circuit controller are being redesigned to have track leads transposed at all of these locations.

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

360	9/19/2002	NS	CTC			NS 6645	Timer	Fayette, KY	N
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Maintenance - Improper Adjustment on Non-Track Circuit Device

On Thursday, September 19, 2002 at 9:01 a.m., Central Division train #215, lead unit NS 6645, proceeding southbound on track 2 at Fayette, KY, observed the home signal at Fayette Control Point MP 79.6 changing aspects from APPROACH to CLEAR, to ADVANCE APPROACH and then to APPROACH DIVERGING. The correct sequence should have been from APPROACH to APPROACH DIVERGING.

Investigation of the above occurrence was duplicated and a defective timer relay was found at Fayette. The timer relay was designed to prevent undesirable upgrade of the signal at Fayette for 9 seconds during the time the code being received was in transition. Since the timer was only running for 5 seconds, the changing aspects were observed by the southbound train. The total time the signals flashed through the cycling aspects was 3 seconds.

The timer relay was readjusted to operate for 10 seconds and the signals returned to service.

341	9/23/2002	BNSF	CTC			P-PHXCHII-21A	None	Ft. Madison, IA	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

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.

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.

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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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354	10/4/2002	CSXT		Automatic		NS-B46	Wiring	Warsaw Crossing At Grade, Warsaw, IN	N
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Human Error - Field Wiring Error, Inadequate Service Testing

At approximately 03:15 on October 4, 2002 the southbound train NS-B46 traveled across the Warsaw Interlocker (Railroad Crossing at Grade) in Warsaw, IN. The NS-B46 proceeded south into the siding at CP 33 (Claypool). The southbound train NS-175 followed the NS-B46 across the Warsaw Interlocker. The crew of the southbound NS-175 reported that they had received a CLEAR indication at the Warsaw Interlocker and a STOP indication at Signal 30 with the NS-B46 ahead. The Warsaw Interlocker was removed from service and Norfolk Southern signal personnel were dispatched. Norfolk Southern signal personnel contacted CSX signal personnel at 07:45. The Norfolk Southern signal personnel was able to re-create the False Proceed signal through standard field testing procedures. During the investigation it was discovered that a Code Following Relay with Frequency Decoding Contacts (STPAR) had the negative control wire for the relay device (SBDR) that supplies battery to the 4S signal on the number 4 (four) contact when it should have been on the number 1 (one) contact. The number 4 (four) contact is a non-tuned contact that follows the working action of the relay. The number 1 (one) contact is a tuned contact that follows the working action of the relay only when the action reaches a minimum of 115 code cycles through a maximum of 125 code cycles. The use of the number 4 (four) contact supplied battery to the SBDR. Further investigation revealed that the circuit plans for the location show that the wire was designed to be on the number 1 (one) contact on the STPAR and the condition was corrected. The appropriate tests were made and the Warsaw Interlocker was returned to service.

702	10/5/2002	LI		Manual		NA	Track Stick Relay (13TS)	Queens Interlocking, Queens, New York	N
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Failed Equipment or Device - Electrical Ground (not in underground or aerial cable)

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

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

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

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

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

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
368	10/8/2002	UP	CTC		ATC	METX 159	None	West Chicago, IL	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			On October 08, 2002 at 18:30 CDT, in West Chicago, IL on the Geneva Subdivision, westbound METX 159, on track 3 at MP 28.50, reported that he received a CLEAR ATC cab signal after he had passed a Yellow westbound signal at Y028.							
			An investigation revealed a design error. The Electrocode program of a new cut section located 1200 feet west of MP 28.50 applied ATC energy to the rails east, when receiving Code 4 from the rails west. When passing the Yellow signal the train should have received no ATC energy.							
			The cut section was removed, pending redesign, and all applicable tests were performed.							
355	10/11/2002	CSXT	AB			Q416-09	S8PT Connectors	W.E. Space Center, Lordstown, OH	N	
			Maintenance - Switch Circuit Controller							
			On October 11, 2002 at 6:00 AM the Q416-09 approached intermediate signal W90.41, displaying a CLEAR signal and stopped east of the signal, made a cut on Q416-09 to pick up cars at the West End Space Center, Goodman Yard. The train crew went west of intermediate signal W90.41 and observed that the signal indication changed to RESTRICTED PROCEED. The crew went west of the trailing point switch, threw the switch reverse and entered the West End Space Center. The switch was left open while working and upon clearing the fouling circuit, train crew reported that the W90.41 signal indicated CLEAR. When the train crew came back out onto the fouling circuit, W90.41 signal indicated RESTRICTED PROCEED. The train crew tied back onto their train, restored the switch normal and proceeded west with permission. Signals were removed from service and signal personnel dispatched to the site. Investigation revealed that corroded track connections from the circuit controller to the rail were the cause of the false proceed signal. All track connections from the circuit controller to the rail were renewed and a new switch circuit controller installed. Full operational tests were performed and the signals were restored to service.							
343	10/30/2002	BNSF	CTC			E-CDJJRM0-05A, B	Insulated Joints	MP 78.0 MT3, MP 77.8 MT3, Bill, WY	N	
			Failed Equipment or Device - Insulated Joint(s)							
			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.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
342	10/30/2002	BNSF	CTC			L-CHI0081-30A	None	Ethel, MO	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			<p>Train L-CHI0081-30A light power, was following train Z-WSPSBD9-30B operating westbound on Main Track 1. Westbound absolute signal at West Ethel was lined to make a follow-up move for the L-CHI0081-30A. The crew operating the L-CHI0081-30A reported that the westbound absolute signal at West Ethel displayed an APPROACH aspect. The westbound absolute signal should have displayed a STOP aspect due to the Z-WSPSBD9-30B occupying the block between West Ethel and the intermediate signal at MP 333.2. The crew stopped their train at MP 332.6, which is approximately 0.5 mile from the rear of the train ahead.</p> <p>Signal department employees were dispatched to the location. Operational tests were conducted to simulate the train movements and events. The tests confirmed the report by the crew on the L-CHI0081-30A.</p> <p>The false proceed was caused by an engineering design error. The design error was not detected in signal service testing. Circuit modifications were made to correct the problem and the signal system was tested with no further exceptions being taken.</p>							
369	11/4/2002	UP	CTC			UP 4598	None	Lehi, UT	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			<p>On November 4, 2002 at 16:30 CDT, in Lehi, UT on the Provo Subdivision, westbound MWCOG-01, on the main track at MP 721.30, reported that the westbound absolute signal at West Mesa was Flashing Red into a "Track and Time" permit.</p> <p>An investigation revealed a circuit error that permitted the Red indication to flash without the signal being requested.</p> <p>The circuit error was corrected, and all applicable tests were performed.</p>							
370	11/6/2002	UP	AB			UP 4357	None	Toyah, TX	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			<p>On November 06, 2002 at 11:16 CDT, in Toyah, TX on the Toyah Subdivision, westbound 1ZNSLC-04, on the main track at mile post 665.1, reported that the westbound absolute signal at the east end of Toyah was Green, with the hand throw switch at the west end of Toyah in the reverse position.</p> <p>An investigation revealed a circuit error. The normal switch relay for the east end of Toyah was not breaking the HD control for the westbound signal at the west end of Toyah.</p> <p>The circuit error was corrected, and all applicable tests were performed.</p>							

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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371	11/9/2002	UP	CTC			AMTK 451	None	Oakland, CA	N
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Vandalism - Signal Damaged, Caused Phantom Aspect

On November 09, 2002 at 09:40 PDT, in Oakland, CA on the Niles Subdivision, southbound AMT714.09, on the main track at mile post 6.40, reported that the southbound signal at N1006 was Red while they were approaching it, and when they were about 30 feet from the signal, it turned Yellow.

An investigation revealed the door to the signal head was slightly opened, which allowed sunlight to make the Red signal look Yellow at approximately 30 feet from the signal.

The condition was corrected, and all applicable tests were performed.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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703	11/15/2002	CN	CTC			CN5427	Absolute Signal 10E	Port Huron, MI	N
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Maintenance - Wiring Chewed by Rodents

Mouse had built a nest in the red unit of a colorlight signal and had eaten the insulation off of the wires supplying energy to the bulbs in the red and yellow lenses. The nest pushed these wires into contact with each other causing the bulb in the yellow lens to light. This produced a R/Y aspect even though the dispatcher did not request the signal.

The nest was removed, the wires replaced, signal mast sealed to prevent further intrusion. Signal cables were meggered and found to be above 500k ohms. Proper operation of the signal was confirmed with route and aspect testing to ensure that correct aspects were displayed and were upgraded as intended.

(see attached letter to Brian Eisel for further details)

[Following text from letter to Brian Eisel, RR Safety Inspector, Signal & Train Control, FRA:]

On Friday, November 15, 2002 at 0836 hours, CN train #380 received a PROCEED indication more favorable than intended at signal 10E, Tappan Interlocking, MP 332.20, Flint S/D. Train #380 was a northward train on the Mt. Clemens Subdivision. Its destination was into track #1 at Port Huron.

Train #380 approached signal 10E and accepted a signal that displayed a R/Y indication. The Troy dispatcher (TD3) had not issued a control to clear the signal for this movement.

The incident was reported to the Signal Department around 0930 hours. Replays of the event were made from both the Toronto and Troy RTC computer equipment. Signal Department personnel arrived at Tappan at 1200 hours.

Upon investigation by the Signal Department the signal displayed a R/Dark. This is a colorlight signal. The signal foreman working on this investigation climbed the signal and removed the back cover and found that a mouse had recently built a nest in the red lens housing which obscured the visibility of the bulb shining through the red lens.

He then discovered that the mouse had eaten the insulation off of the light wires that provided battery power to the bulbs in the red and yellow lenses and that they were in such close proximity to each other that the slightest movement touched them together and both bulbs would light.

Both of these wires showed abrasion in the areas where they could touch indicating that they had been making contact. These facts indicated that train #380 did receive an indication more favorable than intended.

No other trains passed this signal in this condition. Repairs were made by the signal inspector and foreman by 1600 hours. The signal was tested and placed back in service around 1800 hours. Further testing was conducted and concluded by 2000 hours. Testing that was performed insured that the proper aspects were displayed for all the routes that this signal governed, and that the correct signal upgrade was made as intended.

This activity was observed by FRA Inspector Brian Eisel from beginning to end.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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372	11/17/2002	UP	CTC			MWCEU.16	None	Hotlum, CA	N
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Vandalism - Signal Mechanism Shot - Stuck in Position

On November 17, 2002 at 16:16 PDT, in Hotlum, CA on the Black Butte Subdivision, northbound MWCEU.16, on the main track at mile post 352.85, reported he passed a Green northbound absolute signal at North Hotlum, and looked back to see the southbound signal was Green.

An investigation revealed that the southbound signal mechanism had been damaged by gunfire and jammed in the Green position.

The signal mechanism was replaced, and all applicable tests were performed.

704	11/19/2002	SEPA	AB				Track Relay	Automatic Signal 330, Pennbrook, PA	N
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Vandalism - Instrument Case, Cable, or Junction Box Damaged

Vandalized relay case caused weather conditions to fail relay. See attached report from Foreman.

[following is the entire text of the attached report]

This morning at 6:30 AM signal maintainer [redacted] received a trouble report from the C&S desk that automatic signal 330 was reported dark. This signal is on SEPTA's main line just south of Pennbrook Station.

[redacted] proved the signal lamp to be good and noticed that the AR relay was up with a train in the approach block. As a precaution the maintainer set automatic 330 to STOP AND PROCEED.

The cut section case in automatic 330's block was vandalized. A solid shunt was applied across the rails at the relay end of 330AT circuit and the track relay did not respond. The track relay remained in the energized position after being physically removed from the relay rack.

The state of the relay remained unchanged because it had been exposed to the elements and was covered with ice as a result of the vandalized signal case.

Repairs were made to secure the case and the track relay and its repeater were replaced and tested.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
345	11/23/2002	BNSF	CTC			PRICBIRI20A, CSXT	195TR & 195XTR	Memphis, TN	N	
			Vandalism - Instrument Case, Cable, or Junction Box Damaged							
			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.							
344	11/26/2002	BNSF	AB			VMCISBD8-25	None	Coal City, Illinois	N	
			Scenario Reenacted, Unable to Duplicate, No Defects Found							
			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.							
361	11/29/2002	NS	CTC			NS 9361	PSO Coupler	Bellevue, OH	N	
			Failed Equipment or Device - PSO Coupler							
			On November 29, 2002 at 9:15 p.m., train LB 28, lead unit NS 9361, while approaching the eastbound signal at Bragg Rd., MP B-246, observed signal to be RESTRICTING. When train LB 28 was seven (7) car lengths from the signal, it upgraded to an APPROACH for less than a second, then dropped to STOP. Train was stopped four (4) car lengths from the signal. Train 403 was proceeding east in the block ahead of LB 28.							
			C&S investigation determined that a Phase Shift Overlay (PSO) rail to line coupler was discharging enough voltage on the signal control line circuit to energize the R222 HD relay causing the signal to display an APPROACH signal for a second and cancelling the stick circuit causing signal to drop to STOP. The phase shift overlay is superimposed on the signal control line wire and the coupler discharged into the relay after the track circuit was energized. This overlay circuit was not in service at this time.							
			Manufacturer is testing coupler and their use in this application. The PSO will be moved to spare wires and vendor is reviewing its application.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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373	11/29/2002	UP	CTC			UP 6573	None	Wellington, UT	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On November 29, 2002 at 10:02 MST, in Wellington, UT on the Green River Subdivision, eastbound CCSWE-25, on the main track at mile post 613.50, reported that the eastbound signal at West Wellington cycled from Flashing Yellow to Green with a westbound train entering the siding at East Wash.

An investigation revealed that the point detector on the power switch at East Wash was failing intermittently as the westbound train passed over the reverse switch, causing the main track HD line circuit feeding west to pump. The existing circuitry at West Wash/East Wellington pole changed the HD circuit feeding west in response to this pumping action, resulting in a Green aspect at West Wellington.

The circuits at West Wash/East Wellington were revised to prevent a reoccurrence of this failure. All applicable tests were performed.

362	12/5/2002	NS	CTC			NS 9515	Thermal Timer Relay	Reid, KY	N
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Failed Equipment or Device - Relay

On Thursday, December 5, 2002 at 2:30 p.m., train #230, lead unit NS 9515, reported the northbound automatic signal at MP 356 changing from APPROACH to CLEAR prior to passing the signal. The next signal at Reid, Control Point MP 32.0 was a DIVERGING CLEAR into number two track. The correct aspect for the signal at 35.4 would have been APPROACH to APPROACH DIVERGING.

Investigation of the above occurrence was duplicated and found to be a thermal time relay at the 35.4 automatic signal. The time was designed to hold off the signal upgrade at 35.4 for 8 seconds. This allows the northbound signal to remain at APPROACH until the track code changes to positive and the minus codes for the approach is lost.

If the timer operates less than the required time the coding of a minus for the APPROACH and a plus for the APPROACH DIVERGING gets decoded as a minus plus (CLEAR).

The timer relay was replaced and the signals returned to service. The particular timer is a type B1 GRS LOS timer and is common on the first and second districts of the CNO&TP. All locations are being inspected for style of timer relay and operation is being checked.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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364	12/16/2002	NS	CTC			P40	Signal Circuits	Kannapolis, NC	N
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Failed Equipment or Device - Track Isolation Unit

At 7:50 a.m., December 16, 2002, southbound train P40 observed the northbound 339.8 intermediate signal, as his southbound train passed the adjacent southbound proceed signal at the 339.9 intermediate signal location.

P40's train had passed the 339.9 southbound signal by approximately 3 - 4 car lengths, as Engineer observed an APPROACH DIVERGING (Y/G) signal at the adjacent northbound 339.8 intermediate signal. At this time, P40 still occupied the track circuit north of the 339.8 northbound signal with approximately 1/2 mile of train. The APPROACH DIVERGING signal was displayed for 3-4 seconds before displaying a RESTRICTING signal (R/R with number plate). The signal remained RESTRICTING until P40 Engineer could no longer observe the 339.8 signal.

C&S personnel investigated and were able to duplicate the signal as observed by Engineer. Investigation found shorted blocking diodes in a trackcode isolation unit located at the 339.8 signal location along with excessive current on the track circuit. The current limiting diodes shorted in the isolation unit allowed the track relay to pick up from the kick back circuit generated by the inductor magnetic field collapse. The track relay followed the code being generated for a following move due to the stick circuit being energized. The code following track relay allowed the BD relay to energize and display the northbound APPROACH DIVERGING aspect. Track circuit current levels were adjusted, the isolation unit was changed out and the signal system tested. Returned to service at 3:30 p.m. on 12/16/02.

363	12/17/2002	NS	CTC			908P217	Relay Circuit	Burlington, NC	N
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Human Error - Field Wiring Error, Inadequate Service Testing

At 12:01 p.m. on 12/17/02, train 908P217 with engine 5196 handling 1 load 11 empties, passed the westbound STOP signal at control point Merrill, M.P. H23.5. Train passed the STOP signal by approximately 182 feet. Train crew reported to dispatcher that the non-automatic signal at Haw River, NC, M.P. H25.5 displayed a CLEAR aspect. The controlled holdout signal at MP H23.5 displayed a STOP aspect.

Investigation of the incident revealed the CLEAR signal indication at the non-automatic signal at MP H25.5 displayed account of improper temporary wiring made by signal personnel during a signal cutover on 12/13/02. The "H" and "D" output of the Electrocode unit were wired together to the coil of the relay used to light the CLEAR aspect, allowing either the "H" or "D" to display the CLEAR.

The wire was removed from the "H" output to the relay coil and the system was tested and returned to service at 2:00 p.m. on 12/17/02.

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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356	12/20/2002	CSXT	CTC			Y133-20	None - Phantom	CP Woods, Indianapolis, IN	N
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Cause
Narrative
Vandalism - Signal Damaged, Caused Phantom Aspect

At about 1520, the Y133-20, lead engine CSX 2759 and two hoppers, reported a SLOW APPROACH at CP Woods while traveling eastbound on yard track "B" in the Chevrolet Transfer Yard. The crew of the Y133-20 questioned the IC dispatcher as to their route, when they were informed to stop their movement due to a signal not being requested at the control point. Signal personnel were dispatched to the scene and upon arrival, found the #2E-2 signal displaying a STOP indication. The #2E-2 signal is a two position color light signal that had a yellow aspect in the "A" head and a red aspect in the "B" head. Observations made 20 feet away from the signal found a faint yellow aspect visible and a red aspect displayed in "B" position with no signal requested. Further inspection revealed that vandals had damaged the outer lenses of the yellow and red aspects. All ground and cable integrity tested within FRA specifications. Lamp voltages on the red and yellow lamps were 9.5V, with no voltage/current evident on the yellow aspect circuitry with the signal at STOP. With the signal requested, depending on the route, either a Yellow/Red or a Yellow aspect illuminates. All routes were lined displaying the correct aspects. This signal displays only SLOW APPROACH, RESTRICTING or a STOP indication. The diagnostic logs from the Indianapolis Dispatching Center confirmed that the signal was not requested. Replaced the vandalized lenses, installed longer hoods and returned the signal to operation. We are reporting this event but we do not consider this to be a false proceed.

374	12/22/2002	UP	AB			AMT510	None	North King City, CA	N
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Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)

On December 22, 2002 at 23:19 CST, in North King City, CA, on the Coast Subdivision, southbound AMT11-20, on the main track at milepost 157.80, reported the southbound signal at MP 157.8 displayed a Green aspect and the next southbound signal at MP 159.20 displayed a Red aspect.

An investigation revealed the HD line north, the HD line south, and the Common were wrapped at MP 159.2.

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

705	1/14/2003	CN	AB				113N Trk Relay	Broadview, IL	N
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Human Error - Field Wiring Error, Inadequate Service Testing

A westbound train, WC 349 on main track #2 reported signal 11.3W CLEAR and signal 13.3W RESTRICTED. Upon investigation, the 11.3W westbound approach signal displayed CLEAR when it should have displayed APPROACH. The transmit battery wire was transposed on the 113 Normal Track Relay which was energized when it should have been deenergized, and the 113 Reverse Track was deenergized when it should have been energized. Prior to the incident a construction gang was replacing track wires at Des Plaines Ave. on the Freeport Subdivision near Broadview, IL. After replacing the track wires, the crossing was tested, however the foreman failed to test the wayside signal system, which consisted of back to back BH relays and line circuits.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
410	1/14/2003	UP	AB			UP 9252	None	Shreveport, LA	N
<p>Cause</p> <p>Narrative</p> <p>Maintenance - Pole Line (storm, excessive vegetation, rotting poles, excessive slack in wires, etc.)</p> <p>On January 14, 2003 at 1342 CST, in Shreveport, LA on the Reisor Subdivision, northbound MSHFW 14, on the main track at mile post 315.80, reported the northbound signal at Hollywood, mile post 315.8 cleared when they had passed the signal, and were still in the block north of the signal.</p> <p>An investigation revealed that at milepost 316.0 a pole fell and caused a short in the signal control wires, which false cleared northbound signal at Hollywood Jct., MP 315.8.</p> <p>The pole line was repaired and all applicable tests were performed.</p>									
399	1/17/2003	NS	CTC			NS 9077	Phantom Aspect, Color Position Light Sign	Hurt, VA	N
<p>Phantom Signal - Due to Unpainted Signal Hood or Background</p> <p>At 11:00 a.m. on January 17, 2003, train 3529217 with lead engine NS 9077 was eastbound on the Altavista District of the Virginia Division when the crew reported they observed an APPROACH DIVERGING aspect on signal 2026 at MP V 202.6 and received a STOP aspect at CP Hurt at MP V 200.2. The 2026 signal should display an APPROACH aspect with a STOP aspect at CP Hurt. This is electronic track territory with electronic interlockings and color position light signals. Cables were meggered, relays tested and grounds checked at both locations with no exceptions found. Logger cards were installed at both locations. The 2026 signal was returned to service on January 17, 2003.</p> <p>On Saturday, January 18, 2003 the signal was observed at the same time as the eastbound move on the previous day from a test engine with C&S and Transportation personnel on board. Conditions were similar to that of the previous day and in approach of the 2026 signal there appeared to be two white lights on the bottom head of the signal in the 90 degree position. Further investigation found that the signal hoods over the bottom head lenses were faded on the top and sides of the hoods. The sun was to the right of the signal and sunlight was reflecting off of the signal heads giving the white light effect. The top head (45 degree yellow) was clearly visible. This could have been mistaken for an APPROACH DIVERGING aspect if the train crew did not watch the signal carefully.</p> <p>The signal hoods in question were painted with a flat black paint and observed in like conditions on January 20, 2003 with no exceptions taken.</p>									
706	1/20/2003	PAL	AB			PAL 2104	Shunt Wire	Louisville, KY	N
<p>Maintenance - Switch Shunt Wires Broken</p> <p>PAL 2104 had CLEAR signal @ MP 3.5 in yard limits @ Louisville Yard. Switch @ MP 3.8 Standard Oil x-over was in reverse position.</p> <p>Investigation Determined: Shunt wires on east rail - one was broken off, the other was high resistant at connection to rail.</p> <p>Connectors were replaced & shunt wires reconnected. System functioned properly after corrective action.</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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392	1/25/2003	CSXT	CTC				Lock Rod Clip	E.E. Georgia, Georgia, IN	N
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Maintenance - Switch Circuit Controller

At about 1425 hours, Q554-25 heading westbound at the East End of Georgia on the Indiana Sub, while Q565-24 was stationary in the siding reported receiving an APPROACH signal. While occupying the OS section of the East End Georgia the crew on Q554-25 observed the switch aligned reverse toward the standing Q565-24. Q554-25 stopped short of the Q565-24. Signals were removed from service and signal personnel dispatched to the scene. Inspection revealed that the internal point detector rod broke leaving the point detector circuit controller indicating the switch in the normal position with the switch points physically reversed thereby allowing a signal request cleared to the standing train in the siding while the circuitry appeared to be lined for the main track resulting in a false proceed signal. Investigation also revealed that an improper installation (clip installed backwards) of the lock rod clip that ensures that the "H" contacts center in the event that the point detector rod breaks and doesn't follow the movement of the switch points. Signal personnel replaced the broken point detector rod, properly installed the lock and clips, performed all operational tests and upon satisfactory completion restored the signals to service. Subsequently, a system-wide instructional notice has been issued to all signal personnel to inspect all switch machines of similar make to ensure that there are no other improperly installed lock rod clips in service.

375	2/5/2003	BNSF	CTC			UROOEVE105A	None Found	East North Dalles, VA	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

The train crew of UROOEVE105A 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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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707	2/21/2003	CN		Manual		STCBCHI1	33 Crossover	Brighton Park, IL	Y
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Human Error - Improper Circuit Jumper in Place

On February 21 at approximately 1730 hours eastward train STCBCHI1 derailed 2 cars at #33 switch at 33 crossover at Corwith Interlocker. The route given displaying a permissive signal at 35 signal was 33 reverse, 39 normal, and 43 reverse to Santa Fe Yard. A second incident had also occurred with the BNSF local reporting that after proceeding past a permissive signal switch 75 was lined reverse, against the established route. At the time of the derailment being reported, the Operator, was verifying in the field that 75 switch was lined reverse.

Signal Supervisor [redacted] contacted Manager [redacted] of the situation and the interlocker was taken out of service. At approximately 1930 hours [redacted] and Field Engineer [redacted] arrived to investigate the incident. It was confirmed in the tower that levers 33, 35, 43, and 41 were pulled, which is correct for signal 35 to display a signal to proceed. Upon inspection of the derailment, it was determined that the #33 switch of the 33 crossover had moved from the reverse position to a position one inch from normal, while the other end of the crossover was still lined reverse. It was also discovered that [redacted] and the Corwith Maintainer were replacing a polar relay for switch 34 while trains STCHCHI1 and the BNSF local were moving across the interlocker. The relay change out started at approximately 16:30 hours and was completed at approximately 1700 hours. While the relay was pulled the Santa Fe main breaker (140VDC), which supplies control battery to the switch machines, was tripped open. At approximately 17:30 hours the main breaker had been reset. At this moment the Supervisor stated he had heard a couple of clicks for the control machine in the tower and within five minutes STCBCHI1 reports they had derailed at #33 switch at the crossover.

Further investigation of the interlocker included resistance testing on all cables, ground tests, and verification of all routes. No exceptions were found during these tests. The incident could not be reproduced. Cause was determined to be human interference during the relay change out.

[Note from editor: The above description is unclear as to exactly how the human interference could have occurred (jumper, etc.). Since it doesn't mention errors in circuit design or field wiring, this false proceed is being charged to Human Error - Improper Circuit Jumper in Place.]

411	2/28/2003	UP	CTC			UP 9135	None	Fair Oaks, AR	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On February 28, 2003 at 1333 CST, in Fair Oaks, AR on the Memphis Subdivision, westbound ZMNMQ 28, on the siding at milepost 319.20, received a Green westbound indication with no signal requested.

An investigation revealed a design error allowing a battery back feed with the red bulb burnt out.

The circuits were revised to prevent a re-occurrence, and all applicable tests were performed.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
709	3/1/2003	DH		Automatic		Train #165	Approach Signal 652.9	Hop Bottom, PA	N
<p>Cause</p> <p>Human Error - Signal Circuit Design Error, Inadequate Service-Testing</p> <p>On Saturday, March 01, 2003, D&H train 165 was traveling northbound on the Freight Main Line. The crew of train 165 observed an ADVANCE APPROACH signal (Rule 282A) at signal 652.9, the northbound approach at CPF at 650, the crew observed a MEDIUM APPROACH signal. The crew reported the incident to the Train Dispatcher at this time and the signal system was removed from service. S&C personnel investigated the report, and determined that a Code 2 indication was being transmitted from the interlocking at CPF 650 in lieu of a Code 4. The codes were corrected to display the proper signal indication and the signal system was tested and returned to service.</p> <p>{Note from Editor: The above report offers no detail as to what caused the incorrect code to be transmitted to the approach signal, and so, this false proceed is being attributed to Human Error - Signal Circuit Design Error, Inadequate Service Testing.}</p>									
708	3/5/2003	CN	CTC			343	Signal 2WA-CL	IKE north - Ray, MN	N
<p>Phantom Signal - Due to Sun Angle</p> <p>NB train 343 was in the siding preparing to proceed NB on a CLEAR signal indication. Temperature was -30degF bright sunny. Signal maintainer was on site working on switch trouble due to frost on switch contacts. At approx. 11:11 train crew reported to signalman that they observed an APPROACH aspect on the main line signal (2WA). At the time they had a CLEAR on signal 2WB.</p> <p>Signal maintainer bagen tests and could not simulate or replicate. No defects were found. Signal supervisor downloaded recorder. Data showed signal 2WA never lined at the time signal 2WB was up. Signal system returned to service when all tests were complete.</p> <p>Train crew later reported in written statement that the lens color of 2WA changed from Amber to Red when they were within 1-2 car lengths. Train crew also reports frost on the signal lenses.</p> <p>Cause appears to be a phantom aspect due to angle of sun on signal lens with heavy frost. Frost was removed from signal.</p>									
376	3/6/2003	BNSF	CTC			ZWSPKCK906	None	Gorin, MO	N
<p>Scenario Reenacted, Unable to Duplicate, No Defects Found</p> <p>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.</p>									

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
393	4/3/2003	CSXT	CTC				Design	South End, Nashville, TN	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			<p>0230 on April 03, 2003 a false proceed signal at South End Interlocking in Nashville Terminal was reported. A signal team responded to the report that signal #14 was CLEAR with the next signal at STOP. The signals were immediately removed from service pending investigation. The signal team determined the sequence of events that led up to the time of the incident as follows. The dispatcher requested signal #14 and then requested signal #6 with a switch reverse at South End. He then requested a southbound signal at Oak Street the next interlocking south. The switch at signal #6 failed to lock up reverse which resulted in signal #6 remaining in the STOP position. The signal at Oak Street cleared which resulted in signal #14 at South End upgrading to a CLEAR into #6 at STOP. Further investigation revealed that the circuitry would allow this failure to occur. The design shop in Jacksonville was contacted concerning the design issues and supplied the necessary correction. Corrections were applied and operational tests were performed with the signal system returned to service upon satisfactory completion at 1130 hours.</p>							
412	4/4/2003	UP	CTC			UP 2205	None	Missouri City, CA	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			<p>On April 4, 2003 at 08:50 CST, in Missouri City, TX on the Glidden Subdivision, eastbound RBMBD-02, at mile post 20.60, reported the eastbound intermediate signal 20.60 was Green, and the next eastbound absolute signal at SA019 was Red over Yellow.</p> <p>An investigation revealed that the polarity on the control circuit to eastbound signal 20.60 was reversed.</p> <p>The signal system was restored to proper operation and all applicable tests were performed.</p>							
377	4/5/2003	BNSF	CTC			Gateway Railroad	54 LB Signal	Kansas City, MO	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			<p>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.</p>							

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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378	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.

710	4/16/2003	ARR	CTC			4016	None	Anchorage, AK	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

Train 4016 South with Engineer, Student Brakeman, Brakemen, and Conductor. This was the relief crew that dog caught the train at Reves. Train crew reported the distant signal at MP 121.3 to be Yellow over Yellow and the absolute southbound signal at CP 1198 to be Yellow over Red with a diverging switch. The signal at CP 1198 were tested and verified that the aspect displayed was Red over Yellow at CP 1198. Event recorders at the distant signal and at CP 1198 as well as CP 1170 were checked and verified the aspects displayed were correct. No exceptions were taken to any of the signal appliances. Interviews of the crew members involved have been completed, and the results of the testing are being explained to all trainmen. No exceptions were found with the signal system. All light wires to the signal were megged, all signal tests were completed on the affected signal.

Attached are the graphic representations of the data downloads from event recorders at the D signal MP 121.3, the VHLC at CP 1198 and CP 1170.

414	4/23/2003	UP	CTC			UPY562	None	Salt Lake City, UT	N
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Phantom Signal - Due to Sun Angle

On April 23, 2003 at 10:25 CDT, in Salt Lake City, UT on the Lynndyl Subdivision, westbound YSC44 22, at mile post 782.40, reported the westbound signal on No. 1 track was Red over Lunar without the signal being requested from the dispatcher.

An investigation revealed the sun reflecting off the outer lens of the bottom red aspect gave the appearance of a lunar.

The outer lens was replaced, and all applicable tests were performed.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
413	4/23/2003	UP	CTC			(WB) UP 9318, (EB	Code Xmit Relay	Kramm, CA	N	
			Failed Equipment or Device - Relay							
			On April 23,2003 at 13:20 PDT, in Kramm,CA on the Canyon Subdivision, two incidents happened. Westbound WDMELB/22 reported westbound signal at 216.10 was Yellow then turned Green until he passed it, and the next absolute signal at CPF215 was Red over Yellow.							
			Eastbound IOASC/22 reported that eastbound absolute signal at CPF213 was Yellow, turned Green, and then back to Yellow while he approached the signal.							
			An investigation revealed a bad 75 code transmitter relay common to both track circuits feeding from CPF215.							
			The code relay was replaced, and all applicable tests were performed.							
379	4/24/2003	BNSF		Remote		G HURINB 1 19, B	2EA Signals (SA Mech)	River Street Control Point, Tacoma, WA	N	
			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.							
711	4/26/2003	PLRR		Manual		958	Drawbridge Hydraulic Control System	Bridge C29.20, Lakeport Drawbridge, Laconi	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			Failure of hydraulic control system raised bridge after a northbound train accepted a CLEAR signal. Signal system has been bulletined out of service while an engineering review is conducted.							
			{Note from Editor: The failure of the hydraulic system notwithstanding, the signal circuitry should have assumed its most restrictive indication in conformance with 49 CFR 236.5, which requires all such circuits to be designed on the closed circuit principle. As such, this false proceed is being attributed to Human Error - Signal Circuit Design Error, Inadequate Service Testing.]							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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415	5/3/2003	UP	AB			UP 4580	H2 Mechanism	Wells, NV	N
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Cause
Failed Equipment or Device - Relay

Narrative
 On May 10, 2003 at 14:40 CDT, in Wells, NV on the Lakeside Subdivision, eastbound 1ZLTG1 10, on the #2 track at mile post 605.2, reported the eastbound signal at MP 605.2 displayed a Green aspect with the next block east occupied.

An investigation revealed the H2 mechanism at the eastbound signal at MP 605.2 was stuck displaying a Green aspect.

The H2 mechanism was replaced and all applicable tests were performed.

380	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?	
			Cause							
			Narrative							
389	5/13/2003	BNSF	CTC			S-BPATAC1-10M	Phantom Aspect	East Wishram, WA	N	
			Phantom Signal - Due to Sun Angle							
			<p>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."</p> <p>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.</p> <p>Signal trouble ticket #937845.</p>							
381	5/15/2003	BNSF	AB			U-INBROO115	0.5 Signal	Seattle, WA	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			<p>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.</p> <p>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.</p> <p>This N12 wire was removed and the signal system tested and then returned to service at 0350 Hrs PT on May 16, 2003.</p>							
713	5/15/2003	ST	CTC			Train ED2	VTB Relay	Control Point CPR-9, Deerfield, MA	N	
			Failed Equipment or Device - Relay							
			<p>Train ED2 at CRML location CPR-9 received a MEDIUM CLEAR (RGR) aspect when routed toward Deerfield Yard tracks at CP 384. Aspect should have been RYR. Track speed for all moves on this track is 10 MPH. Investigation determined that a defective VTB coded track relay caused this problem. Operation was investigated, application of component modified & system tests performed to assure proper function.</p> <p>[Editor's Note: What is meant by "application of component modified"?]</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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712	5/21/2003	CN		Remote		M393 3120	Plant Trap	Wellsboro, IN	N
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Human Error - Field Wiring Error, Inadequate Service Testing

Event: Dispatcher on Desk TD4 from [redacted] operations center reported westbound train M39331 20 accepted a signal 4L at the Wellsboro interlocker on the South Bend Subdivision, although his panel had shown an occupancy on track 2 on the CSX. This occurred on Wednesday, May 21, at 12:41 EDT. Plant was taken out of service to be investigated by the Signal Department.

Investigation: CSX was performing undercutter maintenance on their track, and created a track circuit wire to be severed, therefore creating a track occupancy on the TD4 panel. From the Digicon logs, signal 4L had been previously clear prior to the CSX severing the track wire. This track occupancy put signal 4L at STOP, until the CSX had repaired the track wire. Then the signal recleared even with the panel still reflecting an occupancy.

The occupancy shown on the panel was created by the CSX trap circuit (trap circuits are used for the 66-foot dead section of track where the CSX crosses the CN trackage. In a normal train move the track circuit gets released after the train passes through the entire interlocker. With the occupancy created by the undercutter only on the north side of the interlocker the trap did not release.

The investigation has revealed that planned additions were requested by CSX to this location in 1998. In the investigation we found that CN missed installing a portion of the modifications, also there was a software logic error introduced with the CSX electronic interlocker. Either of the railroads performing these changes correctly would have prevented this false proceed to occur. The CN has retrofitted the logic changes to its portion of the interlocker to correct the situation. The CSX will be correcting their software, to have a second method of preventing this condition from occurring.

It should be noted this interlocker worked properly for all normal through movements, the fault was found only on the trap circuit.

416	5/28/2003	UP	CTC			UP 4052	None	Chalk, TX	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On May 28, 2003 at 14:57 CDT, in Chalk, TX on the Dallas Subdivision, eastbound ASKMQ 27, on #2 track at CP T220 at mile post 219.9, reported the eastbound signal 2E went from Red over Red, to Flashing Red over Red, then back to Red over Red, while a signal was cleared westbound from #2 track to #1 track.

An investigation revealed a circuit error, that left a wrap circuit out of the flasher relay circuit, that allowed the top head of the eastbound 2E signal to flash when a westbound signal for movement from #2 track to #2 track was cleared.

The circuit was corrected, and all applicable tests were performed.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
417	6/2/2003	UP	CTC			UP 2313	None	Rawlins, WY	N	
			Human Error - Signal Personnel Introduced False Energy into Signal System During Testing							
			On June 2, 2003 at 12:15 CDT, in Rawlins, WY on the Laramie Subdivision, westbound IDUSE 31, on #1 track, reported the westbound approach signal to CP W678 at MP 673.3 was Yellow, and the westbound absolute signal at W678 was not called for, and was Red over Yellow, then went to Red over Dark, while the switch was lined normal.							
			An investigation revealed a signal gang, with track and time in the OS, was preparing circuits for a future cut over, and caused the westbound absolute signal at W678 to display other than STOP.							
			All applicable tests were performed.							
418	6/10/2003	UP	CTC			BNSF 706	None	Burbank, WA	N	
			Loss of Shunt - Possible Rust or Foreign Material on Rail							
			On June 10, 2003 at 11:57 PDT, in Burbank, WA on the Yakima Subdivision, eastbound F52817, on the main track at MP 6.3, reported the eastbound absolute signal at CP E006 (West Villard) was Red, turned Green, and then back to Red, with the block occupied.							
			An investigation revealed the CAD log indicated a loss of shunt in the occupied block.							
			All applicable tests were performed.							
382	6/11/2003	BNSF	CTC			ZWSPLAC408A	Cable	San Bernardino, CA	N	
			Human Error - Field Wiring Error, Inadequate Service Testing							
			Signal gang replaced cable between the main control house and the westbound control signals at Verdumont. 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.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?	
			Cause							
			Narrative							
419	6/17/2003	UP	CTC			UP 6297	CTU Unit	Fairfax, IA	N	
			Failed Equipment or Device - HXP Crossing Control Transfer Unit							
			On June 10, 2003 at 11:40 CDT, in Fairfax, IA on the Clinton Subdivision, westbound MBYDM 17, on the South Track at MP 89.13, reported a Green train control into a Red absolute signal at CP A090.							
			An investigation revealed a HXP Crossing Control Transfer Unit at CP 090 was damaged from a power surge and was back feeding the North Track's CLEAR train control onto the South Track.							
			The HXP Crossing Control Transfer Unit was replaced, and all applicable tests were performed.							
400	6/21/2003	NS					Track Circuit	Greensboro, NC	N	
			Maintenance - Improper Adjustment, Track Circuit							
			At approximately 7:20 p.m. on 6/21/03, train Amtrak 74 was running northbound on Track #1 when it received a Green over Red (G/R) CLEAR aspect at the intermediate signal at MP 285.6. Amtrak 74 should have received a Yellow over Green (Y/G) APPROACH DIVERGING aspect. The Control Point at Elm MP 284.5 was lined for a turnout move onto the H-Line and displayed a Red over Green (R/G) DIVERGING CLEAR aspect. This is Trackcode territory with color light signals and GRS 5H power switch machines. The condition was reproduced during testing. An invalid Trackcode pulse was being transmitted from CP Elm to the intermediate signal at MP 285.6. A (+ - +) was being transmitted and deciphered as a (- +) and displayed the CLEAR aspect. When the pulse was adjusted with the NPL adjustment pot to slow down the rate, a (+ -) was sent and deciphered at MP 285.6, displaying the proper aspect, Yellow over Green APPROACH DIVERGING. Current levels on the track were within specifications, all cables were meggered and relays tested with no exceptions found.							
			Track circuit was adjusted to proper rate and engineering change made in the AD & BD relays to prevent this type of signal aspect display in the future.							
394	7/2/2003	CSXT	CTC			Q208-02	None: Phantom	South Latonia, Kenton, KY	N	
			Phantom Signal - Due to Sun Angle							
			At 1500 on July 2, 2003 the NB train Q20802 reported getting a RESTRICTING signal, Lunar over Red, out of the siding with the switch in the normal position and SB X20101 occupying the track ahead. The signals were taken out of service and signal personnel were dispatched to investigate.							
			The Maintainer and Signal Supervisor viewed the signal from the train and from the ground and determined that the sun created an effect on the signal in such a way that a Lunar over Red was displayed when the signal should have displayed Dark over Red. The Maintainer and Supervisor tested the signal system and determined signal system was working as designed. The signals were placed back in service. Longer hood was installed and the signal was refocused to mitigate the effect of sunlight on the signal. We are reporting this event but we do not consider this to be a false proceed.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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420	7/2/2003	UP	CTC			UP 3382	None	Salt Lake City, UT	N
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Phantom Signal - Due to Sun Angle

On July 02, 2003 at 22:15 CDT, in Salt Lake City, UT on the Lynndyl Subdivision, eastbound UGDEO, on the side track at MP 779.10, reported the eastbound signal #12 in the siding was Yellow over Red, and there was no signal requested and the switch was lined normal.

An investigation revealed the outer magnifying lens of the top signal head was not properly sealed to the inner lens, and the angle of the sun caused the Red indication to appear Yellow/Orange.

The lenses were cleaned, resealed, and all applicable tests were performed.

383	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?	
			Cause							
			Narrative							
384	7/14/2003	BNSF	AB			Q-ALTRIC1-11A	Signal 11551	Pittsburg, CA	N	
			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.							
421	8/2/2003	UP	CTC			UP 4425	None	Tornillo, TX	N	
			Maintenance - Wiring Chewed by Rodents							
			On August 02, 2003 at 07:13 CDT, in Tornillo, TX on the Valentine Subdivision, eastbound ILBNS 31, on the side track at MP 792.5, reported the eastbound signal in the siding went Green for several seconds before downgrading to Yellow, with a train ahead of him east of Tornillo.							
			An investigation revealed rodent damage to the circuit wiring causing a battery wire to intermittently false pick the EDR relay giving a Green signal.							
			The damage was repaired and all applicable tests were performed.							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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401	8/9/2003	NS	CTC			9526	B1 Biased Relay	Flovilla, GA	N
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Failed Equipment or Device - Relay

At approximately 12:56 p.m. on August 9, 2003, northbound train 264 ran through a power switch lined against them at Flovilla, Georgia, MP 203 H under a CLEAR aspect. The GRS 5H dual control machine was in the reverse position in hand throw operation. The machine indicated normal correspondence allowing the dispatcher to request and clear the northbound signal for the main track. Train 264 accepted the signal and ran through the switch stopping clear of the OS track. Signals at this location are color light signals, no exceptions were found with the signals, cable or switch machine.

Investigation revealed that the NWP switch correspondence relay had remained in the falsely energized position, after voltage had been removed from the relay coils. This allowed the switch to falsely indicate it was in the normal position.

The control point data logger showed the relay remained in the energized position with the switch machine in hand throw operation and laying in the reverse position. This allowed northbound signal to display Green over Red or CLEAR, and allowed the approach signal at CP Sandy to display a CLEAR aspect for train 264.

The fault and signal display was reproduced and verified during testing. The faulty relay is a 500 ohm biased relay and was removed from service on 8/9/2003.

402	8/12/2003	NS	CTC			8631	Track Circuit	Rockmart, GA	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

At approximately 9:36 p.m. on August 12, 2003, southbound train 924 reported that the southbound signal on the mainline at Control Point Ollie, MP 101.5H went from STOP (Red over Red) to CLEAR (Green over Red) then to APPROACH (Yellow over Red), as train 924 was coming to a controlled stop in advance of the southbound signal at the Control Point.

Investigation revealed that the southbound signal did flash to CLEAR (Green over Red) for 2.5 to 4 seconds before displaying an APPROACH (Yellow over Red) aspect. A permissive signal displayed for such a short time interval should not be considered a viable signal to operate on.

Condition was caused when a single light pusher unit in the block south of Control Point Ollie transversed the insulated joints at the intermediate signal at MP 104.2H. The north track circuit picked up before the south track circuit was de-energized, permitting a single pulse of 180 code being sent to CP Ollie. The track code information was deciphered at Ollie and a CLEAR signal displayed for time interval noted. This is GRS Rate Code Track Circuitry.

This condition was reproduced and the CLEAR signal aspect displayed for 2.5 to 3 seconds repeatedly during testing. To correct the condition, the code selection circuit was modified adding a contact of the southbound (1041) directional stick relay in the circuit to eliminate the 180 code transmission into the oncoming train with the southbound directional stick relay energized.

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

715 8/21/2003 CP CTC CP 8526 Sig. 1W MP 385.9, Vermillion, MN N

Scenario Reenacted, Unable to Duplicate, No Defects Found

[Text of e-mail message from Timothy L. Lyon (S&C Supervisor, LaCrosse, WI), to himself on 8/25/2003]

On Thursday night at about 2302 I was contacted by Operations Control Center that a train had reported a signal displayed a DIVERGING CLEAR and that the signal should have been a DIVERGING APPROACH.

I immediately had the local maintainer go to the site and test the signal. Maintainer arrived on site and had the Dispatcher request the same line-up as had been requested for the train. Signal displayed a DIVERGING APPROACH. Site was ground tested with no exceptions found. Signal head and junction box were inspected with no defects found.

On Friday morning I contacted the Technician in the Soo Line building for a copy of the logs from the CTC system for the timeframe involved in the accident. Those logs are attached to this message.

On Friday morning, after talking to the Technician, I then drove to the site and was met by the Signal Maintainer. We proceeded to retest the signal again. The line-up was duplicated from the previous evening when the incident occurred. We had the Dispatcher duplicate the entire move, including the stack request. The signal, when lined displayed a DIVERGING APPROACH.

We then meggered the cable from the house to the signal with no exceptions found. We also did another ground test with no exceptions noted. We also inspected the signal head and junction box with no exceptions noted.

Signal lamp voltages are as follows: Green 9.0, Yellow 9.0, Lunar 8.6, Red 9.0. With signal 1W lined for DIVERGING APPROACH, voltages are: Red 8.2, Yellow 8.6.

With signal 1W lined through the crossover from Main Track to Track #2, aspect was a DIVERGING APPROACH in all tests. Incoming codes from East Hastings during the test remained a Code 1 & 2 during the entire test.

Outgoing codes were a Code 1 & 3. All codes are as prescribed by the print.

Control point to the west is East Hastings, all signals were displaying Red aspects as no signals had been lined at this location as shown in the attached logs.

Train that reported this incident was train # 297-20 (CP 8526).

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

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

Failed Equipment or Device - Interior Wiring

Sequence of Events:

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

Failure Cause:

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

Repair & Testing:

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

Recommendations:

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

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
403	8/24/2003	NS	APB			8923	68H Relay	White Siding, TN	N
<p>Cause</p> <p>Failed Equipment or Device - Relay</p> <p>On August 24, 2003 at 3:30 p.m. CDT, eastbound train No. 334, while stopped in the East End of White Siding observed the eastbound mainline signal MP 540.2A display a CLEAR signal. Westbound train 391 was running on CLEAR signals in the automatic block territory between the West End of Rossville and the East End of White Siding. The eastbound signal at the E.E. White Siding displaying a CLEAR did not downgrade to STOP until westward train 391 passed the automatic signal at MP 538.8A. Trains operate under track warrant authority in the Automatic Block Signal territory.</p> <p>The failed condition was observed by C&S Supervisor while performing simulation tests. The failure was determined to be the 68H relay at automatic signal MP 536.8A. In attempt to duplicate the actual conditions a heat lamp was used to apply heat to the 68H relay. After applying heat for 30 minutes the relay remained energized without power for 4 minutes. The relay failed the field drop away test with a value of 1.8 milliamps. The last relay test was performed on September 9, 2002 with a drop away value of 4.7 milliamps. Required test interval is 4 years. The relay was manufactured by GRS with a tag date of March 27, 1971. It is a 900 ohm neutral relay. Relay is being shipped to Texas Transport Institute, College Station, TX for further testing.</p>									
422	8/24/2003	UP	CTC			UP 2466	Circuit Controller	Stanwix, AZ	N
<p>Maintenance - Switch Circuit Controller</p> <p>On August 24, 2003 at 02:45 MDT, in Stanwix, AZ on the Gile Subdivision, eastbound 1 ALAWFX 20, at CP SP819, had a CLEAR signal for a move from single main track to #1 main track, and the movable point frog was not in full reverse position.</p> <p>An investigation revealed the securing screws supporting the reverse switch indication contact assembly of the M23 switch machine had come loose, letting the reverse contacts make with the movable point frog not in full reverse position.</p> <p>The circuit controller assembly was replaced and all applicable tests were performed.</p>									
385	8/26/2003	BNSF	AB	Remote		ZCHCSSE124	Hand Throw Switch MP 4.05, Main 1 SB	ARGO Interlocking, Seattle, WA	N
<p>Human Error - Signal Circuit Design Error, Inadequate Service-Testing</p> <p>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.</p> <p>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.</p> <p>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.</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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404	8/26/2003	NS	APB			3285	Incorrect Wiring	Leighton, AL	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On August 26, 2003 at 11:30 a.m. CDT, eastbound train A80 left Sheffield Yard on an APPROACH signal at MP 399.0A. Another eastbound train Q36 had left Sheffield Yard prior to A80. Train A80 reported the next automatic signal at MP 396.2A, Leighton, AL to be a CLEAR signal but suspected that train Q36 had not traveled far enough east to permit the signal to clear. In addition they had heard the Town Creek defect detector reporting the passing of train Q36, indicating that the train ahead had just passed the next signal location at MP 393.2A. Train crew of A80 notified the signal maintainer.

C&S personnel investigated and discovered the S-Code Electronic Track Circuit cabinet was improperly wired at the automatic signal location MP 396.2A. The wiring was corrected per the location signal plans and operational tests performed.

405	8/27/2003	NS	CTC			8818	B-1 Biased Relay	Mansfield, OH	N
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Failed Equipment or Device - Relay

At 6:03 p.m. August 27, 2003, train 528, traveling from track #2 to track #1 westbound at CP Lucas, reported the home signal was LIMITED CLEAR (Red over Flashing Green). 528 reported his next signal, intermediate signal 1727-1W, displayed STOP AND PROCEED. Train 528 brought his train to a normal stop. No other trains were involved.

Upon arrival the condition was reproduced and was determined to be caused by a melted contact in the 1727 AHP relay. This contact had battery B-12 on the front and the positive coil of the 1727 AHPP relay on the heel. This condition allowed the 1727 AHR and 1727 AHP relays to be energized and the 1727 to be de-energized when, under normal conditions, it would have been energized. Had the 1727 AHPP been energized, the 1727 signal would have been displaying an APPROACH aspect vs. STOP AND PROCEED. The HD circuits leaving the 1727 signal towards CP Lucas are controlled through the 1727 AHP relay. The aspects to be displayed on 1727 signals are controlled through the 1727 AHPP relay. This scenario allowed the HD circuits to upgrade back towards CP Lucas account the 1727 AHP relay being energized but, account the 1727 AHPP being de-energized held intermediate signal 1727 AHPP at STOP AND PROCEED.

The cause of the relay contact melting in the 1727 AHP relay is suspected to have been caused by several severe thunder storms and lightning in the area earlier in the afternoon.

The 1727 AHPPR relay is a GRS Part #298 B-1 biased 194 ohm slow drop. The relay was replaced in kind and the signal system tested and restored to service at 11:16 p.m., August 27, 2003.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
395	8/28/2003	CSXT	CTC			N935-15	Wiring	East End of B&O Siding, Fostoria, OH	N
			Human Error - Field Wiring Error, Inadequate Service Testing						
			<p>On August 28th at approximately 21:10, westbound N93515 on #2 track at the East End of the B&O center siding, reported receiving a Yellow over Yellow (APPROACH SLOW) into a STOP signal at the West End of the B&O center siding. Signals were removed from service and signal personnel were dispatched. During testing and inspection of the signals, it was discovered that a wiring change from a prior project was made incorrectly that allowed the improper aspect to display if the R178WFSR stick relay was picked. The wiring error was corrected, operational tests were performed and the signals were returned to service.</p>						
423	9/4/2003	UP	CTC			UP 1674	None	Mitchellville, AR	N
			Loss of Shunt - Possible Rust or Foreign Material on Rail						
			<p>On September 04, 2003 at 16:14 CDT, in Mitchellville, AR on the McGehee Subdivision, southbound MPBBT 04, at MP 393.90, reported southbound signal A394 was Green, with the next block south occupied by (light power) LWB71-04, UP1674 & UP 912.</p> <p>An investigation revealed the CAD Log verified a loss of shunt by the LWB71-04.</p> <p>All applicable tests were performed.</p>						
396	9/8/2003	CSXT	CTC			Q27808 - L29607	Wiring	Lemoyme, OH	N
			Human Error - Field Wiring Error, Inadequate Service Testing						
			<p>On Sept. 8th at 13:44, Q27808 was sitting at the westbound absolute signal number #1 at Lemoyme, MP CD 111.0, waiting to cross over to #2 track following the L29607. L29607 was WB on #2 track. Q27808 heard the L29607 call the aspect on the 1071-2 intermediate signal, the 2nd intermediate west of Lemoyme. Q27808 observed the WB signal on #2 track display a MEDIUM CLEAR, Red over Green, for 6 to 8 seconds before slotting off to STOP. The event log indicated the WB signal at Lemoyme had gone into time. The signal was removed from service. A simulation recreation of the false clear. An investigation revealed that the coded track circuit west of the 1091-2 intermediate signal, the first intermediate west of Lemoyme, when shunted, had an 8 to 10 second delay before the 1092-2 or 1071-2 HD relays would be deenergized. The 8 to 10 second delay was found to be caused by wires on a front and back contacts of the 1092-2 ZTR, code following relay, that had been reversed and were not according to design. This resulted in energy being applied to the positive coil wire of the 1092-2TPR when the track circuit was shunted. The 1092-2TPPR drops the HD circuits. The 1092-2TPPR wasn't dropping immediately due to a capacitor, which by design, was across the coil wires causing an 8 to 10 second drop delay while the capacitor bled off. This caused the improper aspect to be displayed for eight to ten seconds as reported. The wiring error was corrected, operational tests were performed with no exceptions. The signals were placed in service.</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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717	9/15/2003	CN				NS 278	21L Signal	Gilman, IL	N
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Cause

Narrative

Phantom Signal - Due to Sun Angle

NS278 crew reported at approximately 1840 during sunset that 21L signal B head was Yellow. NS crew was on the Gilman Sub at 23L signal going to the Chicago Sub. A southbound IC M34241 was also going across the interlocking on the main. The dispatcher questioned the crew if it was the sun but they said it wasn't. The dispatcher told the Maintainer that 21L signal was not called for.

The maintainer, supervisor and inspector meggered the signal cables and tested for grounds. The relays were also tested. The interlocker was placed in remote control to do a reenactment and test the signal. The approach to 23L signal was shunted and remained shunted during the suration of the tests, because this is where the NS train was located. 1R and 13R signals were lined and 18T was shunted north then south of the diamond, 21L signal remained Red. We also shunted 21RT and lined 21L signal to verify the call on (B head Yellow) and got the signal indication. 21L signal was cleared and shunted 18T, 21L signal went to Red. Gilman Interlocker Harmon Logic Controller was downloaded. We verified that 21L signal was not called for or true.

The next evening during sunset the supervisor and maintainer went and inspected the signal. The weather conditions were similar to the day before. It appeared to be lit. We climbed up the signal mast and opened up the door and verified the bulb was not lit. Within 30 minutes it no longer appeared to look lit. A light diffuser was ordered for this signal to remedy the problem.

718	9/17/2003	TRRA		Remote		NS 115D817	Interlocking Signal #54	SH Interlocking, Venice, IL	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

At 11:18am, September 17, 2003, interlocking signal #54 displayed a less restrictive signal than intended for movement of Norfolk Southern (NS) train 115D817. 115D817 was following Gateway Eastern (GWE) train GWE17 southward on the northbound main track between SH Interlocking and CP Junction Interlocking. At 11:24am, NS train 115D817 reported the GWE train ahead in the same block and the improper signal indication observed on interlocking signal #54. The NS train 115D817 was able to stop short of the GWE17 train without incident.

Signal #54 was taken out of service immediately by the TRRA Merchants Dispatcher. Investigation of incident by Signal Department revealed that signal #54 had displayed an APPROACH, Rule 285B (Yellow over Red) for the following movement of the NS 115D817. The correct aspect should have been RESTRICTING, Rule 290B (Red over Yellow).

The cause of failure was determined to be an error in the signal control circuit design that was not detected during in-service testing. Immediate corrective action was to disable the "following stick relay" (58FSR) which would normally allow a RESTRICTING signal only for a following train movement into an occupied block. Signal #54 was then retested and restored to service at 1:00 pm on same date. The following stick circuit will remain disabled until the signal control circuit is modified and retested.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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424	9/24/2003	UP	CTC		ACS	UP 3205	None	Cheyenne, WY	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On September 24, 2003 at 19:00 MDT, in Cheyenne, WY on the Sidney Subdivision, westbound LCA53 24, on 3 track at CP W508, reported a westbound Red over Lunar signal to proceed into the yard, and his cab signal went from a Yellow to a Flashing Yellow when they entered the OS circuit.

An investigation revealed a circuit design error.

The circuit was corrected and all applicable tests were performed.

386	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).

387	9/30/2003	BNSF	CTC			L-NWE823130	CL	Everett, Washington	N
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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.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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388	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.

397	10/21/2003	CSXT	CTC			Q52621	Workmanship	Montfort, MP 172.2, Hendersonville, TN	N
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Human Error - Field Wiring Error, Inadequate Service Testing

At approximately 1227 on October 21, 2003, northbound Q52621 received a CLEAR (Green) signal at MP 172.2 with northbound Q28621 in the second block ahead. The correct signal should have been an APPROACH (Yellow). Signals were set to Red and removed from service and Train Control personnel were dispatched.

The cause was found to be a broken cable at a circuit controller which had been spliced together incorrectly earlier that day and placed back in operation at approximately 1200 hours without proper operational tests being performed. The wiring error was corrected, operational tests were performed, and signals restored to service.

425	10/21/2003	UP	CTC			BNSF 8819	2 Relays	Castle Rock, CO	N
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Failed Equipment or Device - Relay

On October 21, 2003 at 13:20 MDT, in Castle Rock, CO on the Colorado Springs Subdivision, northbound BNSF 8819, on the main track at MP 31.6, reported the northbound signal at MP 31.6 was Flashing Yellow and the next northbound signal at MP 29.4 was Red.

An investigation revealed a high resistant contact on the coded 20T track relay along with an internal jumper missing in the 20HR relay allowing northbound signal at MP 31.6 to alternately display Yellow and Dark.

The relays were replaced and all applicable tests were performed.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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406	10/30/2003	NS	CTC			NS 5555	Vandalized SA Searchlight Mechanism	Johnson City, NY	N
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Cause
Narrative

Vandalism - Signal Damaged, Caused Phantom Aspect

On 10/30/2003 at approximately 8:50 a.m., train H1GHA30, engine NS 5555, 25 loads, 37 empties with no hazmat, reported signal 4W on track 2 at CP Johnson appeared to display a RESTRICTING aspect. Upon stopping his train and walking up to observe the signal, Engineer reported the signal at STOP but the inner lens was broken. The sun was shining directly into the signal at this time. The phantom aspect was caused by an unknown party breaking the inner lens allowing the sun to be refracted in the outer lens. The inner lens was replaced, and all appropriate tests made prior to returning the signal to service.

719	10/31/2003	AMTK		Manual			Route Locking	Union Interlocking, Rahway, NJ	Y
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Human Error - Field Wiring Error, Inadequate Service Testing

On October 31, 2003 at approximately 7:15am New Jersey Transit train no. 3818 derailed while diverting No. 1 to "A" track west end of Union Interlocking over No. 43 switch reverse. The train remained upright, with only the lead MU derailed. There were no passenger injuries associated with the derailment. Investigation found that signal circuit wiring revisions completed incorrectly in May 2001 caused this derailment. As a result of this mistake by Amtrak signal employees the Route Locking was ineffective when the first circuit was occupied on No. 1 track in advance of the 44L signal when NJT 3818 passed the signal. Although Union Interlocking doesn't have an event recording of signal functions (no event recorder installed). NJT 3818 locomotive event recorder indicated that the cab signal changed from 120 (APPROACH MEDIUM) to 75-code rate (APPROACH) when the train crossed the insulated joints located close to 43-switch points. This event recording information indicates that the points of 43-switch had to move away from the reverse position toward normal position because the track circuit is designed with separate feeds that correspond with switch position. The C&S department believes that the tower lever man was able to operate the No. 43-switch to the normal position, and then back to the original reverse position in the face of NJT 3818 (however, the lever man states that he never threw the switch when NJT 3818 was traversing the route). This action caused the first MU car to derail when the first wheel set of the truck went toward No. 1 track, instead of No. "A" track. On October 31, 2003 C&S forces resolved the wiring problem; however, on Monday, November 3, 2003 the 43-switch was removed from service pending the completion of a full point check of all revised circuits. Discipline investigations will be scheduled for the responsible employees, as well as an inspection of other projects that were completed by the same Supervisor crew.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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407	11/3/2003	NS		Automatic		F729729	Signal System	Durham, NC	N
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Human Error - Improper Circuit Jumper in Place

At approximately 12:00 p.m. on November 3, 2003, CSX train F729729 approached the D&S Interlocking at MP H57.4 on the H-Line and MP D86.40 on the D-Line, westbound on the CSX track which intersects both the H-Line and D-Line at this interlocking. As F729729 approached the interlocking, the signal controlling CSX westbound movement across the diamond, displayed a PROCEED aspect, Green over Red. The crew then noticed NS train E22 had fouled the interlocking limits, attempting to make a northbound move on the D-Line through the interlocking.

Train E22 stopped at the 2R signal of the interlocking, the signal was dark and E22 acted in accordance with the time table special instructions for movements across the interlocking with signal outages or troubles. E22 had moved across the joints at the signals and fouled the interlocking 2T OS track but had not fouled the diamond when F729729 observed E22. E22 was waiting the prescribed 5 minutes before proceeding across the diamond. The CSX signal should have displayed a STOP, Red over Red aspect.

Investigation found that the 2T OS and 2L approach track circuit relays had been energized with temporary jumpers during new construction at this interlocking. The D-Line had been taken out of service during the new work. While out of service, the 2T OS and 2L track wires were destroyed during grading and temporary jumpers were applied to get the interlocking back in service for CSX train moves. The D-Line was then restored to service without the 2T OS and 2L approach track relay jumpers being removed.

The D-Line is currently out of service pending restoration of damaged interlocking cable and the 2T OS track circuit has been restored to service and tested.

426	11/4/2003	UP			ATC	UP 4418	None Found	Fairfax, IA	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

On November 04, 2003 at 12:55 CST, in Fairfax, IA on the Clinton Subdivision, eastbound ZOAG16 01, on track #1, had a CLEAR cab signal, and could see ahead that the eastbound signal at MP 92.60 was Red. The cab signal changed from CLEAR to RESTRICTING at MP 93.48.

An investigation of the cab signal system on the UP 4418 and on the track from MP 95.50 to MP 92.60 could not duplicate the report. Recorder tapes from UP 4418 revealed that the cab signal was falsely clear between MP 95.50 and MP 93.48.

408	11/12/2003	NS		Remote		NS 3425	10WB Dwarf P/L, Signal Man Failure	GP Works, Altoona, PA	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On 11/12/03 at approximately 6:40 p.m., Engineer and Conductor moving light engines NS 3425 and NS 3359 reported signal 10WB displaying a SLOW CLEAR with the next signal 12W at STOP. Investigation revealed that the internal wiring of signal 10WB was improperly wired, the green and yellow wires reversed causing 10WB to display a SLOW CLEAR instead of a SLOW APPROACH. Wiring error was made on 7/21/02 when 10WB was replaced and improperly tested. Corrections made along with proper tests and signal returned to service on 11/12/03.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
427	11/15/2003	UP	CTC			UP 3934	Case Wiring	Niland, CA	N
			Failed Equipment or Device - Interior Wiring						
			<p>On November 15, 2003 at 22:14 PST, in Niland, CA on the Yuma Subdivision, eastbound MWCFW-13, on the main track at MP 665.63, reported the eastbound absolute signal at CPSP665 (West Niland) was Yellow over Dark for a move into the siding.</p> <p>An investigation revealed that case wiring had deteriorated, which allowed false battery to keep the 84RAHPR relay energized.</p> <p>The wire was replaced, and all applicable tests were performed.</p>						
428	11/20/2003	UP	CTC			UP 2236	None	Vaughn, NM	N
			Phantom Signal - Due to Unpainted Signal Hood or Background						
			<p>On November 20, 2003 at 14:32 MST, in Vaughn, NM on the Carrizozo Subdivision, westbound MHNEP-19, on the main track at MP 741.2, reported the westbound absolute at CP TC741 (West Vaughn) was Green, then turned to Red, with the switch at West Vaughn lined against him.</p> <p>An investigation revealed the Red signal appeared Green for a short time, from reflection off of the top of the signal hood, while the westbound train was rounding a curve.</p> <p>The signal was realigned, and all applicable tests were performed.</p>						

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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398	11/25/2003	CSXT	CTC			Z16025	None: Phantom	Hopple Street, Cincinnati, OH	N
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Cause
Narrative

Phantom Signal - Due to Sun Angle

Northbound NS train on #1 track passed by a STOP signal at 10:19 11-25-03. Logs were pulled and indicated signal was at STOP. Train crew reported they had an APPROACH at previous signal at Tower A and then a RESTRICTED PROCEED at Hopple Street. Signal personnel were dispatched and upon arrival, observed signal at STOP. Crew also stated that when they saw the dwarf signal, they were about two cars away from the signal and it was lit Green - Yellow with white lights underneath. As the train went by the signal, they also saw Red indications with white light, which they took as RESTRICTED PROCEED. With the above information, Transportation officers from NS, CSX and CSX signal personnel returned to Hopple St. to observe the signal. We observed the sun was shining bright on this day and would have been behind the approaching train's back and could have been shining directly into the signal at the time of the incident. Operational tests were performed on the signal and no exceptions were taken.

Further investigation on 12/01/03 (next day of similar light conditions) was conducted and it was observed that the sun was shining into the signal making it look as though all lights were lit.

Dwarf signals on #1 and #2 tracks were realigned forward to vertical. This action substantially reduced the effect of the sun shining on the lenses. Hoods on these signals are 7 inches long. 12 inch hoods have been ordered and will be installed upon delivery. We are reporting this event but we do not consider this to be a false proceed.

429	12/9/2003	UP	CTC			UP 9072	Code Following Relay	Ft. Hancock, TX	N
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Failed Equipment or Device - Relay

On December 9, 2003 at 15:26 CDT, in Ft. Hancock, TX on the Valentine Subdivision, westbound IMNLB 07, on the main track at MP 780.7, reported the westbound approach signal to SA738, East Iser, was Yellow over Yellow, and the next westbound signal at SA738 was Red.

An investigation revealed a defective 120 CDF (code following relay) allowed the WDDR to energize while receiving 75 code.

The relay was replaced, and all applicable tests were performed.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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720	12/21/2003	CN	CTC			WC 5707	Sig. 544 S. Trk Circuit	State Line South CP	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

At approx. 16:18 on 12/21/03 SB Engine WC7507 reported a R/G aspect at State Line S. MP into a R/D aspect at approach signal at Grim Rd. MP 54.4. At approx. 17:10 CN2554 reported the same.

Plant was taken out of service, signalmen tried to reproduce defective aspect. Unable to simulate the defective signal in the field. Tested for grounds, none found.

Recorder at S. State Line shows track circuit bobbling to the south. New turnout being installed at MP 53.0 earlier this day was adversely affecting the circuit at this time.

4 rail bonds were found off in the circuit at the new turnout location. Bonds were replaced.

At the same time an indication problem was occurring between the Dispatcher's office and the field at State Line South. Indications were lost or delayed. Once the ATCS radio was reset in the field indications began to function normally.

Temp was 45deg and sunny with no snow on the ground. This report is being submitted by the request of [redacted].

409	12/22/2003	NS	AB	Remote		NS 9752	Signal	Van Loon, IN	N
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Vandalism - Signal Damaged, Caused Phantom Aspect

On Tuesday, December 22, 2003 at 8:49 a.m., train 20E was traveling east on the Chicago District westbound main track. Engineer and Conductor on engine NS 9752 called the home signal at Van Loon interlocking, MP B-497.9 a SLOW APPROACH (Yellow over Red). The crew was contacted by the Chicago District dispatcher in Ft. Wayne, IN, after proceeding past Van Loon. The dispatcher informed the crew to bring their train to a stop. The crew of 20E walked back to observe the dwarf signal and reported the signal had been painted orange.

Investigation of the above incident verified that the 3 position color light dwarf signal had the top and bottom lenses painted orange and the can of spray paint was laying by the signal.

The incident was also reported to railroad police for further investigation.

The signal lenses were replaced and 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?	
			Cause							
			Narrative							
390	12/29/2003	BNSF	AB			Y-HUT-1011-29	Signal Circuit Design	Hutchinson, KS	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			<p>The local, working between Dodge City KS & 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>							
391	12/29/2003	BNSF	CTC					East Victorville	N	
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing							
			<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>							
433	1/2/2004	CSXT	CTC			071502	Relay	North End of Indiantown, Indiantown, FL	N	
			Failed Equipment or Device - Relay							
			<p>At 1430 hours on January 2, 2004, train crew report on O71502 while operating southbound on signal main track into signal siding over reverse switch, observed and reported a MEDIUM APPROACH (Red over Yellow) into the siding with a set of cars setting in siding. The signals were removed from service at 1645 hours and a team was dispatched to the site to investigate this event. Investigation revealed that the RBCTPR relay, a Track Coding Relay, had bridge contacts, allowing the Code Following Relay (RBTR) to be energized. Further investigation revealed that the RBCTPR relay contacts were allowed to become bridged from the constant shunting of the track from the train cars left in the signaled siding for a long period of time. The constant coding at a high current value caused the contacts to become pitted and bridged. The cars were stored in the siding three weeks prior to the incident.</p> <p>The RBCTPR relay was replaced and a circuit design to open the negative coil path through the RBCTPR relay coding contact. Signals were restored to service at 1400 hours on 1/9/04.</p>							

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
			Cause						
			Narrative						
435	1/7/2004	UP	CTC			UP 5012	None	Pedley, CA	N
			Human Error - Signal Circuit Design Error, Inadequate Service-Testing						
			<p>On January 07, 2004, at 06:27 PST in Pedley, CA on the Los Angeles Subdivision, westbound ETULA 06, on track 2 at MP 48.80, reported the 2-west signal at C049 was Yellow over Green, with the next westbound signal C047 CLEAR for movement into the pass track.</p> <p>An investigation revealed a design error that allowed the bottom head at westbound signal C049 to be Green with the switch at C047 lined for the pass track.</p> <p>The design error was corrected, and all applicable tests were performed.</p>						
436	1/8/2004	UP	CTC			UP 2016	None	Grosse Tete, LA	N
			Human Error - Improper Circuit Jumper in Place						
			<p>On January 08, 2004 at 13:05 CST, in Grosse Tete, LA on the Livonia Subdivision, northbound LLL08 08, at MP 101.40 on the main line, was lined for the siding, and reported a Red over Yellow northbound absolute signal at L101 with the siding occupied.</p> <p>An investigation revealed the H circuit was bridged not letting the G relay drop out.</p> <p>The bridge was removed, and all applicable tests were performed.</p>						
431	1/14/2004	NS	CTC			NS 5578	None	Bryan, Ohio	N
			Loss of Shunt - Possible Rust or Foreign Material on Rail						
			<p>On 1/14/04 at approximately 10:30 a.m. train B41, engine only, moving east on track 2, observed 2E signal change from Red (STOP) to Green for approximately 6 seconds then back to Red (STOP) while train B40, engine only, was in the block ahead. Office diagnostics revealed that train B40 lost shunt several times during his movement. Train B41 did not proceed on the Green aspect. All track circuits between CP 340 and intermediate signal at MP CD335.9 were tested with a .06 ohm shunt with no exceptions. Due to rain, no evidence of contamination was found. The prior movement to this incident was an empty grain train (bean meal). As a precaution an order for light engine to operate by absolute block has been placed in these limits.</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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721	1/15/2004	CN	CTC				HT Switch 40.08 NWP	N. Mundelein, IL	N
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Human Error - Field Wiring Error, Inadequate Service Testing

At 11:30AM on 01-15-04 a defect was found in the signal system a N. Mundelein, IL on the Waukesha Sub. The South Dispatcher [redacted] train to hand operate the hand throw switch at MP 40.08 (near Maple St.) on the #1 main. When train operated HT switch Dispatcher noticed a track light on the #2 main. Signal Dept. was notified and HT switch was spiked and 20 MPH HER was applied.

After investigation it was discovered that the 40.08 NWP was wired into wrong MicroTrax unit at N. Mundelein/ 40.08 NWP switch is on the #1 main, however, it was wired into the #2 coded track unit in error. This 40.08 NWP should have been moved from the #2 unit to the #1 unit during the 11-09-03 cutover, when the N. Mundelein's power turnout was converted from a RH to LH turnout.

Corrective Action:

1. The NWP was wired into the correct track and tested on 1-15-04. All other HT switches in cutover area were also tested. 40.08 was then returned to service.
2. The CN is currently reviewing its testing procedures to prevent any future incidents.

434	1/19/2004	CSXT	CTC			P05218	Design Error	West AY, Richmond, VA	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

At 06:57 on January 19, 2004, P05218 reported the northbound intermediate to West AY was showing CLEAR (Green) with a diverging route lined from #1 to #2 track at West AY. The signal at West AY was displaying a SLOW CLEAR (Red/Red/Green). The signals were removed from service and signal personnel were dispatched. Upon arrival at the location, signal personnel were able to duplicate the reported condition during testing. Initial investigation revealed a design error which allowed the Electrocode unit at West AY to send code to the intermediate signal (26W) allowing a more favorable signal to be displayed at the intermediate with the diverging route lined up. The proper signal aspect at the intermediate should have been APPROACH (Yellow). The design error was verified by office personnel. The circuit was redesigned and field personnel made the necessary changes. The signals were checked and returned to 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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432	1/22/2004	NS		Remote		CSX 3560	18L Signal Unit	Ironville Interlocking, Toledo, OH	N
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Vandalism - Signal Damaged, Caused Phantom Aspect

On January 22, 2004 at 11:30 a.m., CSX train Y121 was shoving south and passed STOP signal 18L at Ironville Interlocking in Toledo, Ohio. CSX train crew was Engineer and Conductor. Conductor was on the caboose on the rear of train Y121. As they approached the 18L signal from seven car lengths they observed the signal display an APPROACH aspect, Yellow over Red. This signal was not requested by the Dearborn dispatcher nor requested in the field as verified by signal personnel at the site. In addition, the block ahead was occupied by signal construction forces working under Track and Time 23A authority. When train Y121 passed the signal the conductor was contacted by the signal personnel. The train was stopped two car lengths beyond the signal. Weather was clear, sunny, about 15 degrees with snow covered ground.

A reenactment of the incident indicated the signal was Red over Red (STOP) when viewed from 100 yards to the signal. Beyond this distance the top aspect of the signal appeared Yellow. The Yellow aspect improved at higher viewing angles.

The 18L signal is a 2 unit ground signal with 2 US&S searchlight mechanisms on the top unit. The lamp voltage was found to be low at 6.6 volts AC. The outer lens of the signal unit had been damaged by outside parties. The last inspection at this location was on November 25, 2003. The H-2 signal mechanism was last inspected on October 25, 2003. The voltage was raised for all the signals and the searchlight housing and operating unit was changed out to prevent a recurrence.

430	1/24/2004	BNSF				P-LACCHF1-23C	2E Signal	Perea, NM	
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Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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722	1/24/2004	INOX		Automatic		40024 Southbound	DN22 B Relay A21HDPR	Quincy, Ohio	N
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Human Error - Improper Equipment Installed

On 01/24/04, Indiana & Ohio Railroad train 40024 Southbound reported a CLEAR aspect displayed on the southbound distant signal to the Quincy Interlocking. After proceeding by the CLEAR signal at Milepost 162.8, train 40024 approached the home signal, Milepost 164.1, and encountered a STOP aspect displayed on the southbound home signal with a conflicting CSX train proceeding through the interlocking. Train 40024 was able to stop in approach of the home signal. Train 40024 advised the INOH dispatcher of the improper aspect displayed on the distant signal. At this point, both distant signals were taken out of service, the southbound being at milepost 162.8 and the northbound being at milepost 166.2 with all train movements being made prepared to stop at the Quincy Interlocking home signals. Notification was made to their independent signal contractor, Railroad Controls Limited (RCL). RCL then dispatched a signal maintainer and two managers to the scene. It was determined that 3 days prior to this incident a biased relay, the A21HDPR, had been replaced at the southbound home signal, milepost 164.1 and replaced with a neutral relay. The coil wires were removed from the A21HDPR to ensure that the signal in question remained at APPROACH. INOH then notified the Rail America Director of Signals & Communications who then directed that all signal cases be secured by a railroad official until the incident could be confirmed. On 01-26-04 RCL and Director of Signals & Communications recreated the incident, and verified the improper relay was the cause of the signal failure. On 01-27-04, RCL completed testing of all relays and cable, completed operational testing, and then returned the signal system back to regular operation at 16:53. At this time, the signal system was operating as intended.

Attached are the circuit plans pertinent to this incident. Note the A21HDPR on sheet 12 of 21. Walter Fithian, Rail America Director Signals can be contacted at 561-245-1506 if additional information is required.

202	1/26/2004	UP	AB			UP 2319	None	Columbus, NE	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On January 26, 1998, at 10:30 CST, on the Council Bluffs Subdivision at Columbus, NE, eastbound LNF10/26, in the siding, observed the eastbound siding leaving signal A848 and the eastbound main signal 846 display Green aspects with track circuit west of eastbound signal 846 occupied.

An investigation revealed the track circuit west of eastbound signal 846 was left out of the control of the eastbound siding leaving signal A848.

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

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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723	2/24/2004	AMTK		Remote			Signal 64L	Valley Interlocking, Philadelphia, PA	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On Tuesday, February 24, 2004, FRA Specialist [redacted] and Amtrak Signal Department personnel inspected Valley Interlocking signal 64L after receiving a report of a signal abnormality. This report indicated that 64L signal on number one (1) track was displaying a SLOW CLEAR signal aspect up to signal 52L at STOP. Amtrak Signal Department personnel in the presence of [redacted] were able to reproduce and verify the report. Signal 64L lighting cable wires 64L2SL and 64LSL were terminated incorrectly inside the low home signal. Inspection also found that the 64LS2L wire was not tagged inside the signal. Signal personnel corrected the wiring, meggered (tested) the cable, field tested signal relays, and made a full operational check of affected circuits. Signal system was left working as intended. Further investigation found that the last time the cable was tested was August 16, 1995. The employees who last tested the cable were interviewed, and claimed that they removed the light bulbs to facilitate testing the lighting cable, and did not remove any cable conductors. The test record that they signed was incomplete in that the 3rd conductor nomenclature was missing. The employees will be counseled for submitting incomplete test record information. Investigation cannot determine when the cable wires were incorrectly terminated. This false proceed incident will be reviewed with all C&S employees, and AMT-23 Rule 202, and AMT-27 Rule 23 will be re-enforced with all employees. These rules address safe procedures for returning vital signal circuits to service after any disarrangement of working circuits.

724	3/3/2004	CN		Manual		WC 3012	Interface Circuit w. METRA	Forest Park, IL	N
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Human Error - Signal Circuit Design Error, Inadequate Service-Testing

On March 3, 2004 at approximately 1515 hours, L50191-03, northbound on single track out of Forest Park (Junction 11) off #2 Main Track reported a CLEAR signal at the approach (CM013.9), then a Red signal at B-12 while E24961-02 was coming off the IHB connection and occupying B-12.

Upon arrival of Signal Supervisor, Testman and Maintainer, download of ElectroCode 4H was obtained and confirmed indications as reported. Check for grounds proved negative. False proceed was reproduced under reported conditions. Circuit plans were reviewed and a defect was found in the Code 4 reference in the ElectroCode 4H. This defect allowed Code 4 to be added to Code 2 already present when the IHB is lined for the WC Main through a contact of the 10LDPPR, sending a Code 7 to the approach signal. To correct this situation, a front contact of the 10LAHPPR was added to the W-C4 reference.

After changes were made to the wiring, all signals involved were tested for proper operation and the approach signal was returned to service.

725	3/20/2004	NJTR		Remote		LRV 3508	1AT (1 ANTR) Track Circuit	CP 175, Burlington, NJ	N
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Loss of Shunt - Possible Rust or Foreign Material on Rail

Train #247 (equipment: LRV #3508) was tripped by the 2N-2 train stop while heading south through CP175 interlocking. The VHLC download revealed the train was tripped because track circuit 1AT picked up while the train was occupying the circuit. The circuit picked up for a duration 8 seconds (1 second over the loss of shunt timer) due to poor shunting. At no time was there a more favorable aspect displayed than STOP.

Immediate action was taken in the form of lowering the track circuit relay current from 230 milliamps to 190 milliamps. A recorder was setup to monitor shunting and additional rail scrubbing has been scheduled for this area.

Report #	Date	Reporting Carrier	Block System	Interlocking	Auto. Systems	Loco or Train No.	Device that Failed	Location	Collision or Derailment?
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726	3/27/2004	CN	CTC			Unk	N/A	Crenshaw, MS	N
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Scenario Reenacted, Unable to Duplicate, No Defects Found

At approximately 1730 crew of southbound train G8869125 reported an alleged false proceed at signal 44.1 on the Yazoo Subdivision. This signal is the approach signal for southward movement to North Crenshaw control point located at MP 46.8. This is ATC territory, authorized speed 79 mph for passenger, 60 mph for freight trains.

Train crew advised they had received a Green over Red (CLEAR) indication for their movement and observed a Red over Yellow (DIVERGING APPROACH) at the North Crenshaw absolute signal, MP 46.8, for southward movement to the siding track. Upon arrival at the location, the Signal Inspector, Signal Supervisor and Manager S&C observed signal 44.1 to be displaying a Yellow over Red indication. The dispatcher was contacted, who advised the southbound absolute signal 46.8 was at STOP. Through coordination with the dispatcher, the investigative team operated the control point through all possible scenarios. In all cases, proper indications and code inputs were observed. All circuits at the location were then tested for grounds with an external battery source and were found to be free of grounds. ElectroLogic unit at the control point was then downloaded. This download indicated that as train G8869125 passed signal 44.1 with the switch at North Crenshaw in the reverse position, signal 44.1 was displaying a Yellow over Green (APPROACH DIVERGING) indication with absolute signal 46.8 displaying a Red over Yellow.

The investigation revealed no facts which would substantiate that the signal system was not operating as intended at the time of the alleged incident.

727	5/3/2004	AMTK					CP 226	Michigan City, MI	N
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Human Error - Field Wiring Error, Inadequate Service Testing

On May 3, 2004 the Engineman operating train number 351 westbound reported to the train dispatcher that signal 224W was displaying a CLEAR signal aspect up against a STOP signal at CP-226 in Michigan City. Signal Department personnel dispatched to investigate this report were able to verify and reproduce the false proceed signal aspect observed by train number 351 at the intermediate signal 224W. An improperly wired GRS SA-1 signal mechanism at CP-226 allowed the 2RRGPR (Red Mechanism Repeater) and the 2RAHDGPR (Yellow/Green Repeater) to become energized at the same time. This resulted in track circuit Code-4 being transmitted from CP-226 to 224W signal location. This caused the 224W to display a CLEAR signal aspect into CP-226 STOP signal. The improperly wired GRS SA-1 signal mechanism located at CP-226 was corrected, and is now wired according to the signal circuit plans. Signal aspect tests were completed, and the signal system is now functioning as intended. It is not known how this error in wiring occurred. This CP has not been modified since its cutover around 1979. Checking the internal wiring of a signal mechanism is not a normal field activity unless there is a problem, and there is no reason to believe that circuits had been modified by field forces for any reason. As a precautionary measure signal department personnel will conduct tests at all locations on the Michigan Line to ensure that this type of incident doesn't occur in the future.

No. of Reports Shown in this Listing: **725**