



IronWood Technologies

Railroad Accident Reconstruction

Federal Railroad Administration

False Proceed Signal Database

January 1, 1995 through May 3, 2004

All Reports Involving Collision or Derailment

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>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>									
103	4/19/1996	UP	AB			FARWRC-15	Spring Switch	Woolridge, Missouri	Y
<p>Failed Equipment or Device - Switch Components Damaged by Dragging Equipment</p> <p>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.</p> <p>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.</p> <p>The signal system was restored to proper operation, and all applicable tests were performed.</p>									

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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.

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.

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189	10/19/1998	BNSF	CTC			BN 7908, HPASFT	GRS SA Mechanism	Spokane, WA	Y
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Cause
Narrative
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.

607	10/22/1998	CR		Remote		Train XSM49E	4TPR Relay	Pittsburgh, PA	Y
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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.

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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.

672	6/21/2001	AMTK		Remote		Engine #552	42EA Signal	Sunnyside Yard "R" Interlocking, Queens, Ne	Y
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Human Error - Signal Equipment Improperly Installed

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.

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294	8/21/2001	BNSF	CTC			M KCKIHB1 19, Eng	None	Ransom, IL	Y
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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 LACNYC1 17, which was stopped just beyond signal 782. The train crew did not know the aspect displayed by signal 782. The signal instrument housings in the area were locked until the arrival of a FRA representative. The signal housings were jointly entered by the FRA representative and signal supervision of BNSF. The position of relays were noted with no exceptions taken. Testing of the signal system was initiated to simulate the train movements with no exceptions taken. Cross and grounds, megger and relay visual and electrical tests were performed on associated apparatus with no exceptions taken. The wiring in the signal mast at Signal 812 was removed for visual inspection with no exceptions taken.

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.

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			Cause		Narrative				

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.

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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.]

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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.

No. of Reports Shown in this Listing: **13**