# BROTHERHOOD OF LOCOMOTIVE ENGINEERS AND TRAINMEN

*A Division of the Rail Conference*
*International Brotherhood of Teamsters*

## Safety Task Force

INDEPENDENCE, OHIO

Before the National Transportation Safety Board

NTSB Accident Number: DCA-15-FR-014

Class: Regional

September 8, 2015

Proposed findings, probable cause, and safety recommendations, in connection with, the collision of two Union Pacific Railroad freight trains at Texarkana, Texas.

Stephen J. Bruno, BLET-Safety Task Force, National Chairman
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**FINAL SUBMISSSION**

## ACCIDENT SYNOPSIS

On Tuesday September 8, 2015, a side collision occurred between two (2) Union Pacific Railroad ("UPRR") freight trains near Texarkana, Texas, at approximately 12:34 a.m. Central Daylight Time (CDT).[1] The collision occurred at Control Point ("CP") CB418, which is an interlocking between two (2) UPRR tracks. CP CB418 is a manual interlocking on the UP Little Rock Subdivision, which runs north and south from North Little Rock to Texarkana, Texas, and the UP Pine Bluff Subdivision, which runs east and west from Pine Bluff Yard in Arkansas to Big Sandy, Texas.

## ACCIDENT NARRATIVE

On September 7, 2015, the train crew for UPRR train AMNML-07 was called at 4:21 p.m. to report for an on-duty time of 6:50 p.m. The train crew reported for work, they received the train's paperwork, performed a job briefing and proceeded to the train. The locomotive engineer prepared to depart the terminal and in doing so enabled the Trip Optimizer[2] ("TO") technology on the lead locomotive. When a locomotive is so equipped, the use of TO is mandatory under UPRR policy; indeed, not only does a locomotive engineer have no discretion regarding the use of TO, he or she is subject to discipline, up to and including dismissal, for a failure to use TO.

The AMNML-7 departed Pine Bluff yard between 8:00 p.m. and 8:30 p.m. From that point on, up until the collision, both crew members stated it was an uneventful trip. The locomotive engineer

[1] All times throughout this report will be Central Daylight Time.

[2] Trip Optimizer is a type of non-vital "Energy Management System" UPRR uses on some of its locomotive fleet to minimize fuel usage.

reported that the crew spoke with the Train Dispatcher, via radio, between 7:50 p.m. and 8:35 p.m.; they were told that they were the only train out running that night, and that it should be a good trip. They proceeded normally on their trip and as they approached Gertrude, milepost ("MP") 416.4 (CP CB416), both crew members reported seeing a Clear signal indication (green aspect). After Gertrude, the locomotive engineer reported remembering nothing until the conductor called out "RED RED" (Stop signal indication) at Texarkana, approximately fifteen (15) to twenty (20) seconds prior to impact. The locomotive engineer stated he manually placed the train into emergency braking application. The locomotive engineer then stated that he "got behind the control stand to, you know, brace for impact." After impact, the locomotive engineer reported being helped up by the conductor as they both exited the locomotive and met the crew members from the train that they struck, UPRR ALDAS 06. During the post-accident interviews, neither the conductor nor the locomotive engineer reported seeing the Automatic Block Signal at MP 417.4 between the Clear signal indication (green aspect) at Gertrude CP CB416 and the Stop signal indication (red aspect) at CP CB418 (MP 419.1), the UPRR interlocking. According to the event recorder downloads from the respective train's lead locomotives, at the time of the collision AMNML-07 was traveling at six (6) miles per hour ("MPH").

**EMERGENCY RESPONSE:**

After the ALDAS-06 was struck, the conductor started back toward the point of impact. The locomotive engineer from the ALDAS-06 retrieved his cell phone from his grip and called the Train Dispatcher; he then went back to the point of impact to render aid. Both crew members from the AMNML-07 were taken to the hospital, where they were evaluated and toxicologically tested. All toxicological results were negative for the presence of alcohol or drugs.

**METHOD OF OPERATION:**

The AMNML-07 (striking train) was traveling west on the UPRR Pine Bluff Subdivision and the ALDAS-06 (struck train) was traveling north on the UPRR Little Rock Subdivision. The two (2) Subdivisions crossed at an Interlocking at Texarkana, Texas. The signal control for the AMNML-07 was Centralized Traffic Control ("CTC") and for the ALDAS-06 was double main track, also controlled by CTC. The railroad crossing at grade is an interlocking, controlled by the UPRR Train Dispatcher. The maximum authorized speed ("MAS") on the UPRR Pine Bluff Subdivision for the AMNML-07 from MP 416.4 to 419.1 (on the approach to the point of impact), is thirty-five (35) MPH. Starting at MP 419.1 and continuing to MP 419.7 (419.1 was the point of impact) the MAS is twenty (20) MPH. The MAS on the UPRR Little Rock Subdivision for the ALDAS-06 from MP 0.0 to MP 1.0 is thirty (30) MPH."

## CREW MEMBERS HISTORY

**AMNML-07 LOCOMOTIVE ENGINEER (STRIKING TRAIN):**

Original Hire Date: 03/15/2004
Certified as Conductor: 07/11/2012
Certified as Remote Control Operator: 04/06/2004
Certified as Locomotive Engineer: 02/06/2007
Locomotive Engineer Certification Expire Date: 10/08/2015

**LOCOMOTIVE ENGINEER FOURTEEN (14) DAY WORK/REST HISTORY:**

| On Duty Date | Job ID | On Duty Time | Off Duty Time | Limbo Time | Total Time On Duty |
|---|---|---|---|---|---|
| 09/07/15 | AMNML 07 | 1850 | | | |
| 09/06/15 | OFF | | | | |
| 09/05/15 | YPB88 05 | 2330 | 09/06/15 1235 | 1:05 | 13:05 |
| 09/05/15 | SSOLR 03 | 0154 | 1140 | 0000 | 10:46 |
| 09/04/15 | OFF | | | | |

| On Duty Date | Job ID | On Duty Time | Off Duty Time | Limbo Time | Total Time On Duty |
|---|---|---|---|---|---|
| 09/03/15 | QSHNLX 03 | 1515 | 0335 | 00:20 | 12:20 |
| 09/02/15 | DH31 02 | 1401 | 1930 | 0000 | 4:29 |
| 09/01/15 | MHOKC 31 | 0500 | 1425 | 0000 | 09:25 |
| 08/31/15 | MNLFW 31 | 0115 | 1435 | 1:20 | 13:20 |
| 08/30/15 | OFF | | | | |
| 08/29/15 | QHONLX 28 | 0445 | 1540 | | 10:55 |
| 08/28/15 | MNLFW 28 | 0030 | 1300 | 00:30 | 12:30 |
| 08/27/15 | OFF | | | | |
| 08/26/15 | MSFPB 25 | 0600 | 1940 | 01:40 | 13:40 |
| 08/25/15 | OFF | | | | |

**AMNML-07 CONDUCTOR (STRIKING TRAIN):**

Original Hire Date: 07/07/2008
Remote Control Operator Certification: 10/13/2008
Conductor Certification: 07/11/2012
Conductor Expire Date: 01/29/2017

**AMNML-07 CONDUCTOR FOURTEEN (14) DAY WORK/REST HISTORY:**

| On Duty Date | Job ID | On Duty Time | Off Duty Time | Limbo Time | Total Time On Duty |
|---|---|---|---|---|---|
| 09/07/15 | AMNML 07 | 1850 | | | |
| 09/06/15 | OFF | | | | |
| 09/05/15 | OFF | | | | |
| 09/04/15 | QHONL 04 | 1916 | 0725 | 00:19 | 12:19 |
| 09/03/15 | KMNLD 03 | 1740 | 0621 | 00:41 | 12:41 |
| 09/02/15 | OFF | | | | |

| On Duty Date | Job ID | On Duty Time | Off Duty Time | Limbo Time | Total Time On Duty |
|---|---|---|---|---|---|
| 09/01/15 | OFF | | | | |
| 08/31/15 | MARKED UP | | | | |
| 08/30/15 | LAID OFF PERSONEL | | | | |
| 08/29/15 | OFF | | | | |
| 08/28/15 | MDANL 27 | 0730 | 2227 | 02:57 | 14:57 |
| 08/27/15 | MPBMX 27 | 0300 | 1445 | | 11:45 |
| 08/26/15 | OFF | | | | |
| 08/25/15 | OFF | | | | |

**CREW MEMBERS INTERVIEWS:**

The AMNML-07 Locomotive Engineer was the first to be interviewed. He stated that his day started about 9:45 a.m. when he awoke. About 11:30 a.m. he performed some yard work then laid down and napped for about an hour until he received his call for work at 4:21 p.m. The call for work was earlier than he was expecting, as he stated in his interview on page 53:

> Q. You was on the extra board, Lem. Were you observing the board and getting an idea of how it was rotating? Were you expecting to go to work that night? Was the board in order?
> A. I was expecting to go to work, but I was expecting to catch a deadhead the way the trains were lined up.
> Q. Uh-huh.
> A. And they called a man out unannounced and he end up catching a deadhead somewhere else, so that put me first out. And

14 then they -- the train -- they prompted that train at –
15 Q. So you thought you were going to go to work earlier?
16 A. **No, I thought I was going to go to work later.**
17 Q. So you thought you was going to go to work later than
18 what you did?
19 A. Yes. Yes.
20 Q. So the board was in order, but we had an unexpected
21 callout?
22 A. Yes.

After receiving his two hour and thirty minute call for work, the locomotive engineer ate and proceeded to work. Upon arriving, the conductor and locomotive engineer performed their duties of getting their train paperwork and conducting a job briefing before going to their train. After arriving at their train they unsecured the train and the locomotive engineer engaged the fuel conservation Trip Optimizer ("TO") operating system. During his interview, the locomotive engineer stated that it was the first time he had used TO on this territory, and only the second time using it in his career. On page 27, when questioned by the Federal Railroad Administration ("FRA") representative, the locomotive engineer stated:

6 Q. For your Trip Optimizer, what's your experience with the
7 Trip Optimizer? How many times have you run with it?
8 A. That was only the second time I've ever used the Trip
9 Optimizer. That was the first time I've used it on that
10 territory.
11 Q. And you said you were on Trip Optimizer prior -- up to,
12 your recollection, right before the incident?
13 A. Yes.
14 Q. And what caused you to take it out of Trip Optimizer at
15 that time? Is that when –
16 A. Well, I never took it out. I think once I placed it in

emergency it probably -- it took itself out.
Q. Okay.
A. You know, because once you make any kind of movement on the controls it'll -- it automatically puts it in manual.
Q. Okay.
A. But I didn't take it -- I never took it out. Once I put it in, from the time I left Pine Bluff, I never took it out until, like I said, we made impact.

The locomotive engineer appeared unsure of how TO works, due to his responses in the interview he uses the terms "I think" and "probably" instead of definitive statements such as "it will" or "it does." He continues to state during the interview that he was not trained by the UPRR on the use of TO on page 29:

Q. Mr. Lemuel, I have just a couple of questions. You said this was the second time that you've used Trip Optimizer.
A. Yes, sir.
Q. Well, first time on this territory. How long ago were you trained on how to use Trip Optimize [sic]?
A. Well, I honestly never had any proper training from anybody. They give you a little -- there was a little pamphlet, you know. They give you --
Q. No classroom time?
A. No classroom. No, sir. No --
Q. Nothing in the job briefing, trainmasters or anybody on instructing on how to use the Trip Optimizer?
A. No, sir.

Despite using TO — an Energy Management System that the locomotive engineer was unfamiliar with and had been provided no formal training on — the trip was uneventful until the train passed CP CB416 on a Clear (Proceed) indication. The locomotive engineer and conductor both reported that they do not remember anything until the Locomotive Engineer observed a red aspect (Stop

signal indication) at CP CB 418 and the conductor called “RED, RED” as the locomotive engineer manually placed the train into emergency braking just prior to impact.

## PROBABLE CAUSE AND CONTRIBUTING FACTORS

The probable cause of the collision at CP CB418 was the failure of UPRR Train AMNML-7 to stop prior to passing the signal at CP CB418.

Uncovering the root cause of the crew’s inability to recall observing the signal at MP 417.4 – which should have alerted them to be prepared to stop at the signal CB 418 – requires a deeper review of all the factors contributing to the accident. The Brotherhood of Locomotive Engineers and Trainmen suggests there are two factors that could explain why the locomotive engineer and conductor cannot recall observing the previous signal at Automatic Block Signal at MP 417.4 which resulted in not having the train under control when it arrived at CP CB418.

First, the inaccuracy of the train lineup that was made available to the locomotive engineer on the striking train left him less than optimally prepared for work.

The locomotive engineer reported awaking about 9:45 a.m. and watching the lineup all day in an attempt to reliable predict his next time to report to work and schedule his sleep accordingly. The lineup showed that he would get assigned to deadhead later in the evening. In anticipation of that predicted on duty time he went to sleep. Instead, the UPRR unexpectedly, called him for another earlier train, which interrupted his sleep and his compromised his attempt to be fully rested at his expected report time.

Second, is the UPRR's mandated use of the Trip Optimizer ("TO") fuel conservation technology. UPRR describes Trip Optimizer in the following way:

> Trip Optimizer provides the locomotive engineer with guidance or automated control for fuel efficient operation of the train based on terrain, train dynamics, permanent and temporary speed restrictions and the train's current authority. The Trip Optimizer software suite resides on a separate non-vital hardware platform on V-TMS equipped locomotives, and is designed and implemented in such a manner as to preclude interference with V-TMS's train control functions.

*See* FRA-2007-27322-0013.

On February 4, 2016, the BLET requested that FRA publish an emergency order prohibiting the mandatory use of TO and similar technologies, pending further study and possible regulation.[3] In its request, BLET identified several issues with the use of Trip Optimizer technology. In particular BLET informed FRA: When operating in a "cruise control" like mode there is a risk of being distracted or lulled into a sense of false security, even though the purpose of the technology is to save on fuel and increase profits, and not to enhance safety.[4]

In this accident, both crewmembers reported having no memory from the point of passing CP CB416 until 500 feet prior to impact. There was little connection with the actual operation of the train during this period, because the train was being controlled by the Trip Optimizer.

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[3] The UPRR mandates the use of TO or similar technologies by a locomotive engineer, under threat of discipline up to and including dismissal for failure to do so, the result is to supersede the engineer's manual control of vital train control functions in favor of an automated, unregulated, non-vital business function (fuel conservation in this case).

[4] Trip Optimizer and similar non-vital fuel conservation systems may increase safety risks because they divert the locomotive engineer's attention away from the track ahead and, instead, toward the automatic control system. Furthermore, such automated systems, by rendering the crew mere observers to the operation of the train, may create an overreliance on the technology

UPRR, has not implemented an appropriate training program for locomotive engineers operating locomotives equipped with TO fuel conservation technology. A proper training program should identify the limitations of the technology, and train the employees on the importance of the locomotive engineer remaining as engaged in the train's operation as much as and as often as possible and when it is appropriate to disengage and reengage the system.

The evidence in this case establishes that the locomotive engineer of the striking crew attempted to get restorative sleep prior to, what he anticipated would be, his next on duty time. His sleep was interrupted by an unexpected call for an earlier assignment because of an unreliable train line up. As such, he arrived for duty less rested than he wanted to be. The facts establish that the locomotive engineer of the striking crew had no formal training, very limited experience with TO and suggest he did not sufficiently understand the implications of relying on an automated operation technology. The combination of less than optimum alertness, coupled with being disengaged from the actual operational decisions of moving the train, contributed to the inability of the crew to be vigilant as it passed the signal at MP 417.4 and as the train approached the signal at CP CB418.

## PROPOSED RECOMENDATIONS

**TO THE FEDERAL RAILROAD ADMINISTRATION (FRA):**

1. Require all railroads to provide accurate lineup information to affected employees in order that they are able to predict their on duty time. This would provide employees the opportunity to secure the preparatory sleep necessary to complete the trip safely and alertly.

2. Immediately issue an emergency order to prohibit the mandated use of and reliance upon LEADER, Trip Optimizer and other similar auto control or advisory control locomotive operating systems until railroads can prove that the relevant safety implications of reliance upon these systems have been properly identified and addressed. Communication-based train control systems that interact with throttle position, train handling, air brakes and dynamic brakes place them in a category where a locomotive engineer is left only in reactive mode, which is unsafe and unsatisfactory.

3. Implement regulations that govern the testing and operation of Energy Management Systems on the nation's railroads.

**TO THE UNION PACIFIC RAILROAD COMPANY (UPRR):**

1. Develop and implement a process to keep train lineups up to date multiple times during the day.

2. Conduct a comprehensive risk analysis then develop and implement a training program for TO and all Energy Management Systems employed on UPRR locomotives.

**CERTIFICATE OF SERVICE**

***I certify that on October 24, 2016 I have electronically served upon Mr. Ricky Page (ricky.page@ntsb.gov), Investigator in Charge, National Transportation Safety Board, a complete and accurate copy of these proposed findings regarding the collision and partial derailment of two (2) Union Pacific freight trains on September 8, 2015 in Texarkana, TX (NTSB Docket No. DCA15FR014). An electronic copy of same was also forwarded to the individuals listed below in this certificate of service, as required by 49 CFR § 845.27 (Proposed Findings).***

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c/o Mr. Ricky Page
Investigator in Charge, DCA-15-FR-014
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***Sincerely yours,***

[redacted]

***Stephen J. Bruno***
***Brotherhood of Locomotive Engineers & Trainmen***
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