NATIONAL TRANSPORTATION SAFETY BOARD

Office of Railroad, Pipeline and Hazardous Materials Investigations

Human Performance and Survival Factors Division

August 8, 2016

HUMAN PERFORMANCE GROUP FACTUAL FINDINGS

A. ACCIDENT

The collision of Union Pacific (UP) train AMNML-07 into the side of UP train ALDAS-06 at about 12:34 a.m. CDT[1] on September 8, 2015 in Texarkana, TX.

NTSB accident number: DCA-15-FR-014

B. HUMAN PERFORMANCE GROUP

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[1] Unless otherwise indicated, all times are denoted in Central Daylight Time.

C. SUMMARY OF THE ACCIDENT

On September 8, 2015 at 12:34 a.m. central daylight time, Union Pacific Railroad (UP) train AMNML-07 (train #1) traveling west on the Pine Bluff Subdivision, main track, collided into the side of UP train ALDAS-06 (train #2) traveling north on Little Rock Subdivision, main track one, at Texarkana, Texas. The collision occurred at a railroad crossing at grade located at the intersection of the Pine Bluff Subdivision, Control Point (CP) CB418, Mile Post (MP) 419.1 and the Little Rock Subdivision, CP R001, MP .5. As a result of the collision, two locomotives of the westbound train UP AMNML-7 along with the thirteenth through the nineteenth cars of the north bound train UP ALDAS-06 derailed. Both engineer and conductor of the westbound train sustained minor injuries. The lead locomotive of the westbound train AMNML-07 UP 2542 derailed on its side resulting in a release of approximately 4,000 gallons of diesel fuel. The fuel spill was contained, afterwards the soil and debris was removed for proper disposal. The Event recorder data indicated train #1 traveling at 19 mph before the train was placed into emergency brake application by the engineer and an impact speed of 6 MPH. The estimated damage is estimated at $4,664,073.00. The parties to the investigation include Union Pacific Railroad, the Federal Railroad Administration (FRA), the Brotherhood of Locomotive Engineers and Trainmen (BLET), the Sheet Metal, Air, Rail and Transportation (SMART)[1] and the Brotherhood of Railroad Signalmen (BRS).

D. DETAILS OF THE ACCIDENT

1. Based on the circumstances of the accident, the Human Performance investigation focused on the crew of train AMNML-07.

2. Behavioral Factors

a. Employee time sheet information.

(1). The engineer of UP train AMNML-07. Time sheets provided by the UP disclosed the following information for the engineer for several days before the accident.

Date	on-duty	off-duty
9/3	3:15 p.m.	12:35 a.m. (9/4)
9/5	1:54 a.m.	11:40 a.m.
9/5	11:30 p.m.	12:35 p.m. (9/6)
9/7	6:50 p.m.	accident (9/8, 12:34 a.m.)

During his interview that was conducted on September 9, 2015, the engineer provided the following work/rest information. He said that he was called to work at 11:30 p.m. on September 4 and went off duty the following day, September 5 at 12:35 p.m. He remained awake and retired at between midnight and 1:00 a.m. on September 7. He arose later that morning between 9:35 a.m.

and 9:45 a.m., began cutting grass at about 11:30 a.m. and finished at 12:30 p.m. He napped from 12:30 p.m. until 1:30 p.m. He subsequently went on duty at 6:50 p.m.

At the time of the accident the engineer had been on duty for almost six hours, and with the exception of a one-hour nap, awake for about thirteen hours.

(2) The conductor of UP train AMNML-07. Time sheets provided by the UP disclosed the following information for the conductor.

Date	on-duty	off-duty
9/3	5:40 p.m.	6:21 a.m. (9/4)
9/4	7:16 p.m.	7:25 a.m. (9/5)
9/7	6:50 p.m.	accident (9/8, 12:34 a.m.)

During his interview that was conducted on September 10, 2015, the conductor was unable to recall the times he awoke and retired for the four days prior to the accident. He was only able to recall that he awoke sometime during the morning of September 4. He also stated that he obtained between eight and nine hours of sleep the night before the accident, and napped between 45 minutes to an hour and a half that same day (September 7). However, he subsequently provided an FRA inspector with the following information:

On September 4, he went to bed at 8:30 a.m. and awoke at 5:00 p.m. On September 5 he went to bed at 10:30 p.m. and awoke the following day, September 6, at 8:00 a.m. On September 6 he went to bed at 10:30 p.m. and awoke the following day, September 7, at 9:00 a.m. September 7.

At the time of the accident the conductor had been on duty for almost six hours and, based on the information provided to the FRA and with the exception of a nap for at most an hour and a half, awake for about fifteen and one half hours.

2. Medical Factors

a. *Health*. The NTSB's Medical Officer received and examined the medical records of both employees involved in the accident. The final factual report pertaining to these records, as appropriate, will be submitted to the docket as a separate report.

b. *Toxicology*.

Pursuant to 49 Code of Federal Regulations (CFR) 219, Subpart C, Post-Accident Toxicological Testing, toxicological specimens were obtained from both crewmembers of train AMNML-07. Substances screened for included cannabinoids, cocaine, opiates, amphetamines, methamphetamines, phencyclidine, barbiturates, benzodiazepines, tramadol, MDMA/MDA, methadone, brompheniramine, chlorpheniramine, diphenhydramine, doxylamine, pheniramine and ethyl alcohol. The results were negative for the presence of alcohol and the aforementioned drugs. Copies of the final toxicological testing results will be placed in the For Official Use Only docket maintained by the NTSB.

Summaries of toxicological test results are shown below.

Position	Specimen obtained	Date/time collected	Results
Engineer	blood	9/8/2015 - 4:06 a.m.	negative
	urine	9/8/2015 - 4:18 a.m.	negative
	breath	9/8/2015 - 2:49 a.m.	negative
Conductor	blood	9/8/2015 - 5:00 a.m.	negative
	urine	9/8/2015 - 4:58 a.m.	negative
	breath	9/8/2015 - 3:22 a.m.	negative

3. Operational Factors

a. *Training.*

(1) The engineer of UP train AMNML-07. Training records provided by the UP disclosed that the engineer successfully completed various training courses related to railroad operations as required to perform his duties in that capacity.

(2) The conductor of UP train AMNML-07. Training records provided by the UP disclosed that the conductor successfully completed various training courses related to railroad operations as required to perform his duties in that capacity.

b. *Experience.*

(1) The engineer of UP train AMNML-07. UP records revealed that the engineer was hired on March 15, 2004. He was certified as an engineer on February 6, 2007, and he was certified as a conductor on July 12, 2012. Also, he was certified as a Remote Control Operator (RCO) on April 6, 2004. Each of these certifications expired on October 8, 2015.

Disciplinary action. UP files had no record of disciplinary actions pertaining to the engineer.

(2) The conductor of UP train AMNML-07. UP records revealed that the conductor was hired on July 7, 2008. He was certified as a conductor on July 11, 2012. His current conductor certification has an expiration date of January 29, 2017. Also, he was certified as a RCO on October 13, 2008, which expires on January 29, 2017.

Disciplinary action. UP files had no record of disciplinary actions pertaining to the conductor.

4. Interviews.

In concert with the party representative from the FRA, UP, BLET and SMART, the Human Performance group conducted interviews of the crewmembers of UP train AMNML07 on September 9 and 10, 2015 in Texarkana, TX. A summary of those interviews in the context of Human Performance areas of questioning is presented below. Complete transcripts of these interviews are located in the public docket.

(1) The engineer of UP train AMNML-07. The engineer said that he went on duty September 7 at 6:50 p.m. He said that he anticipated going to work later than 6:50 p.m., but was called for that start time due to an unexpected callout (mark off) of another employee. He met with his conductor and they spent ten to fifteen minutes reviewing their paperwork. After setting up the Trip Optimizer (TO) they departed Pine Bluff, [AR] at about 8:30 p.m. The engineer recalled that once they left Pine Bluff it was a normal day. While seated in the engineer's chair, he recalled observing a clear signal at control point (CP) 416. The engineer continued by saying,

"A: And after that I don't remember anything until, you know, probably a few seconds before impact. You know, my conductor said we have a -- had a red signal. Then I saw the train going by and I placed the train in emergency and got behind the control stand to, you know, brace for impact. And we made impact and, you know, that's about all.

Q: So for approximately 2 miles you can't recall anything?

A: No, sir. I remember nothing."

Q: Back at -- the last thing that you remember was CP146. Do you remember your throttle position or your speed?

A: No, sir, I don't. It -- like I said, it was in -- the Trip Optimizer in the train was -- it was doing all the controlling by itself."

The engineer said that after observing and calling the clear signal at CP 416, "…everything went blank." He was unable to recall the speed of the train before that, but did recall sounding the horn and resetting the alerter. He also added that after speaking with the dispatcher at about 6:50 p.m. he did not use the radio. The engineer was unable to state if he had fallen asleep or blacked out after CP 416, only that he saw cars in front of him which caused him to place the train into emergency. When questioned as to the activities of the conductor before CP 416, the engineer recalled that he was sitting in his chair opposite him with a dim light on. He added he didn't notice if was asleep at any point or was struggling to remain awake.

He said that after the collision the crew of the other train checked on them, and that fire and emergency services personnel subsequently arrived on scene.

When queried about his health, the engineer replied, "Healthy, I guess." He was unable to recall the date of his most recent physical examination, performed by his personal physician, but said no problems were noted. However, during a physical examination conducted as part of his duties with the railroad within one week of the accident, the engineer said that the examiner noted that his right eye was weak. He recalled that the examiner made notes in his file before sending the report to the UP, and that his engineer certification was pending. The engineer said that he could

see colors, and that when he covered his left eye, perhaps a minute was required for his right eye to focus. When questioned as to when he first noticed this issue, the engineer was unable to say, as he had never closed his left eye. He also said that he wore glasses up to the ninth grade (about 1996), but that the prescription was weak and that his vison was fine without them. Since then he had not worn glasses or contact lenses, including up to and including the accident. The engineer also said that he was diagnosed with a lazy eye when he was a child, (no further information). He denied any problems with his hearing.

When questioned as to use of prescription or over-the-counter (OTC) medications, the engineer denied such use, but added he took vitamin supplements. He denied the use of alcohol or illicit drugs before the accident. As to postaccident toxicological testing, the engineer said the he provided breath, blood and urine specimens at approximately 4:00 a.m. on the day of the accident.

The engineer was asked to characterize his workload up until the accident, and responded, "…light work all the time I was on duty." He denied being distracted from his duties, and likewise was not aware that the conductor was distracted from his duties. He also said there were no problems with any of the equipment on the locomotive, including the TO. The engineer recalled that weather conditions before the accident were dark with a temperature in the low 80's. Finally, when asked if he detected fumes in the locomotive cab before the accident, the engineer responded in the negative.

(2) <u>The conductor of UP train AMNML-07.</u> The conductor recalled that he went on duty at 6:50 p.m. the evening before the accident. He added that when he arrived at work he reviewed his paperwork, got on the train and conversed with the engineer, which included a job brief, and then departed Pine Bluff, AR at about 7:00 p.m. He added he had been speaking with the engineer about "…random stuff," and that they had a "good sense of teamwork." He denied problems of any nature as they proceeded down the tracks. The conductor recalled coming into the interlocker[2] on a clear signal and that everything was normal. He continued, "And it happened - - I saw a red signal. And I said, "Red, red." The train was put in emergency and that's all I remember." The conductor recalled that just before seeing the red signal he had been looking down the track; he did not observe he engineer during that period. The conductor was asked if he was to estimate the distance when he first observed the red signal, but was unable to provide an answer. He also recalled that prior to the accident he had used the bathroom, "…a few times." He said at no point was he distracted, nor to his knowledge was the engineer.

The conductor was specifically asked did he fall asleep before the accident, and responded:

Q. Did you fall asleep during this trip?
A. No.

The conductor was questioned about the engineer, and responded:

Q. Did you observe the engineer? Was he awake?
A. I'm not sure if he was awake or asleep. I went to the rest room. I got up -- you know, I didn't just look over there and say hey, man. I just looked over there. I went to the rest room.

[2] Refers to an arrangement of signal apparatus that prevents conflicting movements through a layout of tracks such as junctions or crossings. The accident occurred at the confluence of two tracks within the interlocker.

When asked to characterize his health, the conductor said, "I'd characterize my health as, you know, good." His most recent physical examination, conducted for the purpose of performing his railroad duties, was about two years before the accident; no problems were noted. When questioned about his vision, the conductor said that he wears glasses and that he was wearing them before and at the time of the accident. He denied problems with his hearing. With regard to use of medications, the conductor said that beginning about two months before the accident he began taking a daily 40 mg dose of Omeprazole.[3] He denied use of additional prescription medications or OTC drugs. He also denied use of alcohol or illicit drugs before that accident. Regarding postaccident toxicological testing, the conductor said that he provided breath, blood and urines specimens at a regional medical center.

When asked to characterize his workload before the accident, the conductor responded, "It was fairly low, I guess." He denied problems with any equipment during the trip.

4. Cellular telephone information.

The Office of Research and Engineering, Vehicle Recorder Division (VRD) of the NTSB examined the cellular telephone numbers that were affiliated with the two crewmembers of westbound train AMNML-07. Records disclosed no activity for any crewmember just before or at the time of the accident. The complete VRD report is located in the public docket.

Compiled by: _____ Date: August 8, 2016
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[3] Prescription Omeprazole is used alone or with other medications to treat gastroesophageal reflux disease (GERD), a condition in which backward flow of acid from the stomach causes heartburn and possible injury of the esophagus