DCA-06-FR-004

Norfolk Southern Rear-end Collision Derailment

Train No. 226 & Train No. 22R

Lincoln, AL

January 18, 2006

Human Factors Factual Report

12 pages, including cover

NATIONAL TRANSPORTATION SAFETY BOARD

Office of Railroad, Pipeline and Hazardous Materials Investigations

Human Performance and Survival Factors Division

September 27, 2006

HUMAN PERFORMANCE SPECIALIST FACTUAL REPORT

A. ACCIDENT

The rear end collision of Norfolk Southern (NS) freight train 226 with NS freight train 22R at 4:17 P.M. CST[1] on January 18, 2006 in Lincoln, AL.

NTSB accident number: DCA-06-FR-004

B. HUMAN PERFORMANCE SPECIALIST

No group was formed. A human performance investigator was not dispatched to the initial on-scene investigation. This human performance investigator was assigned on March 29, 2006.

Lawson F. Narvell, Jr.
Human Performance Investigator
National Transportation Safety Board (NTSB)
Office of Railroad, Pipeline and Hazardous Materials Investigations (RPH-40)
490 L'Enfant Plaza East, S.W.
Washington, D.C. 20594
[redacted]

C. SCOPE OF THE FACTUAL INVESTIGATION

On January 18, 2006 three NTSB investigators were launched to Lincoln, AL to conduct an initial on-scene investigation. The investigative team consisted of an IIC, operations specialist and a signals specialist. The latter investigator also served as the track and event recorders specialist. On March 29, 2006 this human performance investigator was directed to investigate the facts and circumstances related to the performance of the crewmembers and dispatcher involved in the accident. On June 21, 2006 the IIC and the human performance investigator conducted an interview of the NS Director of Medical Services (DMS). This report will be limited to information pertaining

[1] Unless otherwise indicated, all times are Central Standard Time.

to those crewmembers and dispatcher based on information obtained from transcripts, and from an interview of the DMS.

D. SUMMARY OF THE ACCIDENT

On January 18, 2006, at 4:17 p.m. CST, eastbound Norfolk Southern (NS) freight train No. 226A117 (train 226) derailed its 3 locomotives and 7 head cars and the rear three cars of eastbound NS train 22R, when it collided with the train 22 R, which was stopped in the Coosa siding. The collision occurred in Lincoln, Alabama in Talladega County.

The incident occurred while train 226, which was operating at about 53 mph, entered the west switch of Coosa siding located at milepost 757.9 on NS's Alabama Division, East End District. The timetable authorized speed for the curves between MP 763.2 and MP 758.0, which is west of the siding switch, is 55 mph for intermodal freight trains. The authorized speed through the turnout and on the siding is 30 mph. According to the crew of train 226, the engineer was operating on a "clear" signal at Riverside, which is the first signal located west of the switch at Coosa. A clear signal indication would have permitted the train to operate at authorized timetable speed.

The striking train crew was comprised of an engineer, conductor and conductor trainee (CT). The three crewmembers were injured as a result of the collision and were transported to a hospital in Talladega, AL, where they received medical attention. The crew of train 22R consisted of an engineer, engineer trainee, and conductor. None of the crew of train 22R was injured in the incident.

At about 4:20 p.m., emergency responders were notified and arrived on-scene about four to five minutes later. The incident commander was advised of hazardous materials in train 226's consist. It was later determined that as a result of the collision, intermodal containers on train 226 were breached. Twelve of those containers contained hazardous materials. A small amount (less than 5 gallons) of sodium cyanide was spilled on the ground near derailed container MSCU 376266, some of that amount remained in the intermodal container. A second container (TPHU 681321), which was positioned on the same car No.VTTX 097567, was breached and material was released onto the ground where it came to rest. Upon moving the container for trans-loading, several drums fell from the intermodal container, as it was oriented upright, whereupon some of the spilled material in the container was released on the ground. NS estimated that a total of about 250 pounds of sodium cyanide was released from this container.

E. MEDICAL FACTORS

1. Toxicology. Pursuant to 49 Code of Federal Regulations (CFR) 219, Subpart C, "Post-Accident Toxicological Testing," toxicological specimens were obtained from eight NS employees. Testing was conducted by Northwest Toxicology, 2282 South President's Drive, West Valley City, UT 84120. Substances screened for included cannabinoids, cocaine, opiates, amphetamines, methamphetamines, phencyclidine,

barbiturates, benzodiazepines, and ethyl alcohol. The results were negative for the presence of alcohol and the aforementioned drugs in five employees: the conductor and CT of train 226, as well as the engineer, conductor and a road foreman on board train 22R.

Analysis of specimens provided by three employees were positive for the following drugs only, as indicated:

Position	Specimen	Drug	Quantified level
Engineer Trainee of 22R	blood	amphetamine[2]	92 ng/ml[3]
	urine	amphetamine	10,076 ng/ml
Engineer of 226	blood	temazepam[4]	91 ng/ml
	urine	temazepam	7,114 ng/ml
Dispatcher	blood	amphetamine	81 ng/ml
		diazepam[5]	24 ng/ml
		nordiazepam[6]	29 ng/ml
	urine	amphetamine	6463 ng/ml
		nordiazepam	130 ng/ml

2. Medical Records. Complete medical records for the three NS employees who tested positive for the aforementioned substances were obtained from the NS and forwarded to the Safety Board's Medical Officer for his review. The Safety Board's Medical Officer will generate a separate report based upon his examination of those records.

[2] Amphetamines belong to the group of medicines called central nervous system (CNS) stimulants.

[3] Denotes nanograms per milliliter.

[4] Temazepam is used on a short-term basis to help you fall asleep and stay asleep through the night.

[5] Diazepam is used to relieve anxiety, muscle spasms, and seizures and to control agitation caused by alcohol withdrawal.

[6] A metabolite of diazepam.

F. INTERVIEWS

The following is a synopsis of interviews conducted by members of the on-scene investigative team.

The engineer of NS train 226. The operations group chairman conducted an initial interview of the engineer on January 20, 2006. He recalled he received an "approach" signal indication at Pell City[7], and that he reduced speed to about five miles per hour (mph). He stated that the next signal aspect at Riverside[8] was green over red, and that both he and the conductor called the signal "clear" in the cab and over the radio.

On February 1, 2006 the engineer was re-interviewed by the IIC and the operations group chairman. He said he was initially hired as a trainman in May of 1978, became a conductor in 1980 and promoted to engineer in 1995. He was most recently re-certified as an engineer in 2005.

The engineer said that the day of the accident was his first trip back to work after being off for two and one half months due to broken ankle. With respect to use of medications, the engineer indicated that he had been prescribed Motril[9] and Ziac[10], which he characterized as high blood pressure medications, taken once daily, and Pravachol[11] for high cholesterol, also taken once a day. He further stated that while he was off duty with a broken ankle he was taking Lortab[12], a pain medication. The engineer said he discontinued the use of this medication approximately five to six days before the accident. He also said that prior to the accident he had been taking another medication, Doxazosin[13], to treat high blood pressure, but no longer took this. He denied the use of illegal drugs or alcohol before the accident. The engineer reported that with the exception

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[7] Milepost 762.8.
[8] Milepost 760.4
[9] No drug consistent with Motril for treatment of hypertension was able to be located. Quite possibly refers to Motrin, a non-steroidal anti-inflammatory drug used to relieve some symptoms caused by arthritis (rheumatism), such as inflammation, swelling, stiffness, and joint pain. .
[10] A beta-adrenergic blocking agent (more commonly, beta-blocker) and thiazide diuretic combinations which belong to the group of medicines known as antihypertensives (high blood pressure medicine).
[11] Atorvastatin, cerivastatin, fluvastatin, lovastatin, pravastatin, and simvastatin are used to lower levels of cholesterol and other fats in the blood. This may help prevent medical problems caused by cholesterol clogging the blood vessels.
[12] Lortab consists of a combination of medicines containing narcotic analgesics and acetaminophen used to relieve pain
[13] Doxazosin is used to treat the symptoms of an enlarged prostate (benign prostatic hyperplasia or BPH), which include difficulty urinating, painful urination, and urinary frequency and urgency. It is also used alone or in combination with other medications to treat high blood pressure. Doxazosin is in a class of medications called alpha-blockers. It relieves the symptoms of BPH by relaxing the muscles of the bladder and prostate. It lowers blood pressure by relaxing the blood vessels so that blood can flow more easily through the body.

of his broken ankle his health was good. His most recent complete physical exam occurred on January 12, 2006.

With regard to his work/rest schedule, the engineer recalled that he slept eight hours the night before the accident. He reported for duty on the day of the accident at 11:15 A.M. He said he felt rested when he reported to work.

The engineer provided information pertaining to the events that preceded the accident. He recalled that his speed was about five mph as the train approached Riverside. He added that the CT had stepped outside the cab to smoke during that time, and that he had commented to the conductor that he didn't want the CT outside and wished he had stayed inside the cab to smoke.

The engineer recalled, "…as we came around to Riverside, we had a clear signal." He further stated, "I looked at it for the last time, and we still had a clear signal. I called it again in the cab, still clear, and at that time I called it over the radio." He characterized the signal he viewed as "…green over red" and that he observed that signal for "…probably a minute." He noted nothing unusual about the signal itself. He said that after they passed the signal at Riverside the train's speed was 50 MPH, that he then saw the other train ahead of them, and that he placed the train into emergency braking.

The engineer denied problems with any of his equipment, and said that visibility conditions were good before the accident. He denied he was distracted from his duties that day. He also stated he had previously worked with the conductor, but that this trip was his first working with the CT.

The engineer stated that on most occasions his train would bypass train 22R, which was normally ahead of his train as it was on the day of the accident. This was due to the fact that train 22R generally went into the siding and did work at the local Honda plant. Specifically, he said that on those occasions when he worked train 22R he generally worked the Honda plant, and that the train would leave the main track and enter the siding at Coosa[14], and that other trains would then pass by train 22R.

The engineer recalled hearing the dispatcher say over the radio that when his train cleared train 22R, that train was to come out of the siding and travel down the mainline. He also said that a "clear" signal indication at Riverside indicates to him "that 22R is cleared up."

The conductor of NS train 226. The operations group chairman conducted an initial telephonic interview of the conductor on January 20, 2006. The conductor stated he began his railroad career in April 2005.

He said that on the day of the accident he went on duty at 1:15 P.M. The weather was clear with the temperature between 55 and 60 degrees. He recalled the dispatcher informing the train ahead of them, 22R, that she was going to "…head them into Coosa and let us run around them…" He added he heard the crew of 22R on the radio call "divergent approach," and knew they had already entered the siding at Coosa.

The conductor recalled he was seated in the second seat on the conductor's side of the locomotive cab on the day of the accident. He said his crew was presented with an "approach" signal aspect at Pell City, followed by a "clear" signal aspect at Riverside. He further stated that as their train came around a corner approaching Coosa they saw they

[14] Milepost 759.9

train they ultimately struck. He said he observed the signal aspect at Riverside to be green over red, and that the engineer and CT verified that signal to be clear.

On February 1, 2006 the conductor was re-interviewed by the IIC and the operations group chairman. With regard to his work/rest history, the conductor said he had been off 24 hours prior to reporting for duty on the day of the accident, and had worked each day for the seven days before that. He said he normally obtained eight to nine hours of sleep per rest period. He denied use of medications, and when asked about his health stated that he was in "…good shape." His most recent physical examination before the accident was conducted in April 2005.

When questioned about the events pertaining to the accident, the conductor characterized the day as a normal one. He recalled hearing the dispatcher tell train 22R that she was going to "...run them in the siding at Coosa so we could go around them. We were on a priority train." He said he asked the CT what the signal (at Riverside) was, and that he responded clear. The conductor said the engineer increased the speed of their train as they approached Coosa, and that he then shouted that the switch was open, at which point he placed the train into emergency braking. The conductor estimated the speed of the train at that point at between 40 and 50 mph.

With respect to the signal at Riverside, the conductor said it displayed a "…green over red." He further stated there was no confusion amongst the crew about calling signals, and added, "I know what I saw." The conductor stated he operates over this territory at least every other day, and that he normally is presented with a clear signal at Riverside. He said the last radio conversation before the accident was his engineer calling the signal at Riverside.

The CT of NS train 226. The operations group chairman conducted an initial telephonic interview of the CT on January 20, 2006. The CT said that the day of the accident was his first day back from training, and his second trip on this division.

On January 31, 2006 the CT was re-interviewed by the IIC and the operations group chairman. The CT said he was hired at the end of October or early November 2005. He said he normally obtained about eight hours of sleep per rest period, and recalled he retired for the evening before the accident at 10:00 P.M. and was called for his train at 2:00 P.M. the following day. The CT denied taking medications, and that his vision and hearing were satisfactory when he was hired.

With respect to events preceding the accident, the CT said that the crew had an early problem with a signal after departing the yard in Birmingham. He recalled receiving a "clear" signal indication at Riverside after receiving an "approach" at Pell City, specifically that it appeared as a green over red. He stated, "…there's no doubt in my mind that that was a clear signal." He added, "We discussed clear" [at that signal location]. He stated there was no reflection from the sun at the Riverside signal. The CT said he initially called the signal clear, and that the engineer called the signal clear as well. He said he knew that 22R was ahead of them, and that their train (226) was a "hot train."[15]

[15] Railroad vernacular meaning a priority train.

The CT said that the day of the accident was the first time he had worked with the engineer and conductor, and added he didn't even know their names. He also stated there were no distractions in the cab that day.

The NS dispatcher. The Operations group chairman interviewed the dispatcher on January 18, 2006. The dispatcher said she was initially hired in 1985 as a clerk, and has been a dispatcher since October 1997. She dispatches trains between Birmingham, AL and Atlanta, GA and Birmingham, AL and Chattanooga, TN Wednesday through Friday, and that additional territory is added between Birmingham and Columbus, GA on the weekends.

The dispatcher said she went on duty the day of the accident at 2:00 P.M. When questioned about events surrounding the accident, the dispatcher said the first indication she has that something was wrong was when a track light[16] on her computer appeared between Coosa and Embry, which was a "concern." She then contacted train 22R to determine if there was a problem, to which they responded there was not. However, she stated she "…felt like there was something wrong with 226." However, the engineer of train 226 ultimately did contact her and informed her that they had in run into the back of 22R. She then kept talking with both he and the conductor, adding that she never spoke with the CT. The dispatcher recalled the 226 engineer telling her that they had proceeded on a clear (signal), and that they subsequently were lined in on 22R. She then informed him that his train should have stopped at Coosa. The dispatcher said she then contacted 22R and advised them not to move their train. She added the crew of that train acted as if they weren't aware they had been struck.

The NS Director of Medical Services (DMS). The IIC and Human Performance investigator interviewed the DMS on June 21, 2006 in Norfolk, VA. The DMS was initially questioned as the NS's policy pertaining to employees using prescription and over-the-counter (OTC) medications before the accident. He responded, "…it's been a longstanding practice that employees in safety sensitive positions are instructed to report their use or change in prescription drugs to their supervisor, who either the supervisor or the employee directly will contact the Medical Department and obtain approval for taking that medication and working."[17] However, he said there were no specific policy instructions pertaining to this matter, although there existed a general rule that he believed required all employees to disclose an injury or illness.

When questioned as to whether the NS required employees to inform their physician of their duties, the DMS said there was no directive to his knowledge that addressed this. He added that letters are issued to employees when his office becomes aware an employee is taking medications, particularly prescription medications. Specifically, he stated an employee's physician needs to be aware of that employee's job duties so that they in turn can respond back to (NS) that they are aware of said duties, and the employee can safely take the medication at the prescribed dose. The DMS further said that if an employee's physician performs an assessment of how medications or treatment would affect their ability to perform their duties, his office would "…certainly would instruct

[16] An indicator used to convey the condition of a given track section.
[17] Page 5, lines 19 – 24 of the transcript.

him to provide any appropriate medical records related to a particular condition. Say they were injured off the job, for us to do a proper assessment, we often instruct employees to provide those things, but it would be a case-by-case determination."[18]

When questioned as to what extent, if any, he became involved when an employee has been prescribed medications and/or provided treatment by their physician, the DMS responded only when he received a call concerning that matter. However, he would also become involved if the employee underwent a company physical examination wherein they disclosed use of medications, or the presence of a drug was manifested during a drug screen for another reason. If this occurred, the employee would be instructed to provide information from their physician concerning that, and a fitness for duty assessment would then be conducted. A discussion with the employee's physician, if needed, might also ensue. This may be particularly relevant if the employee's physician had prescribed a narcotic, as in the case for someone with chronic back pain. As NS prohibits the use of narcotics for safety-sensitive employees, the DMS would attempt to work with a physician to determine if an alternative to narcotics could be identified for use by the individual.

When questioned as to whether he had been contacted by an employee's physician, the DMS said he receives calls from them about various medical conditions, often in response to NS's request seeking information about a condition an employee disclosed to them. Rarely does he receive an unsolicited call from a physician volunteering information. He said he believed it would be useful to have information from the employee's physician that would enable him "…to review it and determine if we do or do not have an issue regarding fitness for duty."[19]

The DMS said he did not know if the physicians who prescribed medications to the three NS employees who tested positive for various drugs were aware of their respective duties before the accident, but that they certainly were after the accident. He indicated that in two of the three cases, he determined the employees had a legitimate reason to possess and use their respective medications, and "…that some – they've been on some of them [medications] for a lengthy period of time and were stable."[20] However, that was not the case with the engineer of train 226. He added, "I don't believe we discerned the specific reason that the drug had been prescribed. We simply instructed him that he couldn't take it within eight hours of reporting to work once we learned that he was on it."[21]

The DMS said that he contacted all three employees after the accident regarding their use of medications. Concerning the engineer trainee of train 22R, the DMS determined he was legitimately taking Adderall, an amphetamine. In the case of the engineer trainee, the DMS's final determination for his postaccident test was negative. The DMS clarified that there was no indication or record of the engineer trainee taking this medication before the accident. Additionally, the DMS said that the engineer trainee failed to fulfill their unwritten policy.

[18] Page 7, lines 3 – 7 of the transcript.
[19] Page 9, lines 17 – 18 of the transcript.
[20] Page 10, lines 14 –15 of the transcript.
[21] Page 10, lines 7 – 10 of the transcript.

Likewise, the DMS stated that the engineer of train 226 also did not fulfill the medication reporting requirements, adding that he, the DMS, was not aware of the medication being used by the engineer. The DMS said he spoke with the engineer about this matter on February 3, 2006, at which time he disclosed he was taking Restoril. When asked if the engineer would have been required to inform the medical department of this use before the accident, the DMS responded, "Technically no, if he were not taking it while he was working. I mean he could be at home and take the medication and may be one of those situations where it's none of the company's business if he does not come to work under its influence."[22] He added that had the engineer been "..taking it inappropriately or using it on, you know, while he was around work then, yes, he would be violating the rule."[23] The DMS indicated the engineer furnished him with a prescription for the medication that disclosed it was originally prescribed on November 28, 2005, and refilled on January 21 [2006]. The DMS said that when all the postaccident test results came in, he reviewed the engineer's file and noted that he had been off duty, and that a number of medications were listed in the file, but none for Restoril. The engineer underwent a return-to-duty physical sometime near January 13, 2006, and Restoril was not listed on his medical form at that time. The DMS indicated the engineer should have listed it on the medical form at that time, as "There's a box that says list medications currently taken."[24] However, the DMS raised the possibility that the engineer may have misinterpreted the form in that he "…didn't take it the day of the exam or that kind of thing…certainly could be open to interpretation, I suppose."[25] However, the DMS said that the engineer did not disclose the use of the medication, as he would have expected him to. The DMS stated that his final determination pertaining to the engineer's postaccident test results was that they were medically negative.

The DMS discussed the postaccident test results of the third and final employee tested, the dispatcher. As was the case with the other two crewmembers, the DMS said he was not aware that the dispatcher had been taking any of her various medications, adding that she should have informed him of said use. When he contacted her, she disclosed she was taking Adderall for the previous two or three years before the accident. She further stated she was taking Valium as needed, but that she did not take that medication on the day of the accident. He said his information revealed a valium prescription was initially on January 13, 2006. The DMS said that it was his understanding that Norfolk Southern guidelines prohibited the use of diazepam, or valium, within six hours of reporting for duty or while on duty. He added, "It's my belief she can comply with these guidelines, and I know of no instance where she did not comply in the past."[26] He also said there was a follow-up call with the dispatcher's' physician, who confirmed the "sensitive nature" of her position as a train dispatcher. He was unable to state if her physician was aware of her duties before the accident, but certainly was after the accident.

He also said he conducts a medical advisory, i.e., a discussion of medications, when not to take them before work, etc. with an employee when he becomes aware of a

[22] Page 19, lines 10 –14 of the transcript.
[23] Page 19, lines 16 – 18 of the transcript.
[24] Page 21, lines 24 –25 of the transcript.
[25] Page 22, lines 6 – 8 of the transcript."
[26] Page 331, lines 18 – 20 of the transcript.

medication they are taking. This could occur either when a physical exam was conducted or when obtaining medical reports related to a claim where the employee has been injured on the job. Each was conducted on a case-by-case basis "…particularly the hour interval that somebody can't take it and work varies by medication."[27] He said he avoids dispensing general information "…because a lot of the things are case specific and vary by drug and vary by personal response."[28]

The DMS stated that he "…would have certainly hoped that our employees would be more disclosing about things that they've taken."[29] He cited and read Rule G which, in part, essentially prohibits an employee for reporting "…for duty under the influence of alcohol or other intoxicant, cannabis in any form, an amphetamine, a narcotic drug, a hallucinogenic drug, any controlled substances as defined by federal law or a derivative or combination of any of these…".[30] He also noted Rule N, which pertained to off-duty employee injuries/illnesses and the need to report these to their supervisor. With respect to the three employees who tested positive after this accident, he added, "Why these three did not, I don't – I can't explain it. Yes, it is cause for concern."[31] He stated his biggest concern "…is getting the employee and personal physician to accept a larger role or ultimate responsibility really for the issue of drugs and working on the front end. We're here on the back end, and it really needs to happen on the front end.[32] The DMS also said that in terms of educating employees about use of medications, "…periodically we do some articles and things like that and different publications. It's been quite awhile since we've done anything on drugs, and where it's probably timely that we do. We have some other media now that we didn't use[d] to have, and that's the Internet. And we can certainly post those things, you know, post some advice and things like that I think would be useful.[33]

The DMS concluded the discussion of all three employees who tested positive for medications after the accident that it was his determination that all of them were prescribed medication for legitimate uses, and that in each case there was no indication that the employee was abusing their medications. In other words, all three were rules medically negative, information that was also conveyed to the FRA. He said that since the accident there has been no changes to the policy on use of medications by employees.

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[27] Page 35, lines 3 – 5 of the transcript.
[28] Page 35, lines 19 – 21 of the transcript.
[29] Page 37, lines 19 - 20 of the transcript.
[30] Page 40, lines 21 – 25 of the transcript.
[31] Page 38, lines 2 – 3 of the transcript.
[32] Pages 51, lines 23 through page 52 line1of the transcript.
[33] Page 54, lines 9 – 15 of the transcript.

Compiled by: /s/ Date: September 27, 2006
Lawson F. Narvell, Jr.
Human Performance Investigator

Approved by: /s/ Date: September 27, 2006
Gerald D. Weeks, Ph.D.
Chief, Human Performance and Survival Factors Division