HUMAN PERFORMANCE FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

Chattanooga, TN

HWY15MH009

(22 pages)

NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF HIGHWAY SAFETY
WASHINGTON, D.C.

HUMAN PERFORMANCE FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

A. CRASH INFORMATION

Type: Multiple Vehicle Crash, Construction Zone
Date\Time: June 25, 2015 at 7:10 p.m. EDT
Location: Interstate 75 (I-75) Milepost 11.7 Hamilton County, Chattanooga, TN
Vehicle #1: 2007 Peterbilt tractor,
Operator#1: Cool Runnings
Vehicle #2: 2010 Prius
Vehicle #3: 2010 Scion
Vehicle #4: 2003 Mazda
Vehicle #5: 2005 GMC
Vehicle #6: 2001 Ford pick up
Vehicle #7: 2007 Chevy Uplander
Vehicle #8: 2014 Cadillac
Vehicle #9: 2015 Toyota pick up
Fatalities: 6
Injuries: 9

NTSB #: HWY15MH009

B. HUMAN PERFORMANCE FACTORS GROUP

Kenneth J. Bragg, Human Performance Factors Investigator, Group Chairman
NTSB Office of Highway Safety
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C. CRASH SUMMARY

For a summary of the crash, refer to the *Crash Summary Report* in the docket for this investigation.

D. DETAILS OF THE HUMAN PERFORMANCE FACTORS INVESTIGATION

The focus of this report is a crash which involved 2007 Peterbilt in combination with a 2005 Great Dane semitrailer, hereafter referred to as the accident vehicle, which collided with 8 passenger vehicles on an interstate which had slowed due to road construction lane closure.

The Human Performance factual investigation focused on the behavioral, medical, operational, and environmental factors associated with the driver of the 2007 Peterbilt, hereafter referred to as the accident driver. Factors that potentially contributed to the accident are examined in the sections below.

1. Behavioral Factors

1.1. Activities Prior to the Accident

Information from several sources was used to establish the accident driver's activity in the days prior to the crash. Establishing a precise account of his location and activity was hindered because the driver did not record his duty status and, at times, was unable to provide specific information of his whereabouts and activities. Information from an integrated Global Positioning System (GPS) aboard the accident vehicle provided GPS coordinates, and in some instances, vehicle speed and engine status of the accident vehicle.[1] Receipts, scale tickets, invoices, the driver's cell phone device, and bills of lading found in the cab of the truck were also used to establish the driver's activity. When possible, employees of the businesses which provided these documents were interviewed. A summary of the driver's activities for the 72 hour period leading up to the crash are listed in **Table 1**.

Table 1 2007 Peterbilt Driver Activities Prior to the Crash

Monday, June 22, 2015		
Time	Event	Source
3:26 a.m.	Vehicle location recorded in London, KY	GPS[2]
12:26 p.m.	Driver departs London, KY	GPS/Driver Interview[3]
2:19 p.m.	Driver arrives near Glasgow, KY (vehicle breaks down)	GPS/Driver Interview
3:13 p.m.	Vehicle location recorded in Horse Cave, KY	GPS
5:05 p.m.	Vehicle repairs completed in London, KY	Invoice
7:30 p.m.	Driver goes off duty (sleeper berth)	Driver Interview

[1] For GPS data points, see the Technical Reconstruction Group Chairman's Factual Report for this investigation.
[2] See Human Performance Attachment 1: Accident Vehicle GPS Download
[3] See Human Performance Attachment 2: 2007 Peterbilt Driver Interview Transcript

Tuesday, June 23, 2015		
02:26 a.m.	Driver docks for loading, Horse Cave, KY	Shipper Staff Interview
04:44 a.m.	Driver departs Horse Cave, KY	Driver Interview/Bill of Lading[4]/GPS
07:01 a.m.	Vehicle breaks down in London, KY	GPS/Driver Interview
07:05 a.m.	Vehicle is taken to repair shop in London, KY[5]	Driver Interview
11:44 a.m.	Repairs are completed, breaks down	Driver Interview
2:11 p.m.	Driver departs repair shop, Corbin, KY	GPS/Driver Interview
2:24 p.m.	Driver returns to carrier base, London, KY	GPS
3:12 p.m.	Driver returns to repair shop, Corbin, KY	GPS
5:08 p.m.	Driver departs repair shop, Corbin, KY	GPS
6:21 p.m.	Driver fuels truck, Corbin, KY	Fuel Receipt[6]
6:28 p.m.	Driver fuels refrigerator unit, Corbin, KY	Fuel Receipt[7]
6:45 p.m.	Driver weighs load, Corbin, KY	Scale Ticket[8]
7:06 p.m.	Vehicle location recorded in Corbin, KY	GPS
7:20 p.m.	Driver Departs Corbin, KY	GPS
8:35 p.m.	Vehicle location recorded at truck stop in Heiskell, TN[9]	GPS
8:59 p.m.	Driver resumes driving	GPS
11:17 p.m.-11:22 p.m.	Vehicle location recorded in rest area Resaca, GA	GPS
Wednesday, June 24, 2015		
Time	Event	Source
12:22 a.m.	Vehicle location recorded on highway in Atlanta, GA[10]	GPS
1:21 a.m.	Vehicle location recorded in truck stop Jackson, GA	GPS
2:04 a.m.	Driver sends a text message	Cellphone Device
2:23 a.m.	Driver departs truck stop, Jackson, GA	GPS
4:21 a.m.-5:03 a.m.	Vehicle location recorded in rest area Sycamore, GA	GPS
6:07 a.m.	Vehicle location recorded in truck stop Valdosta, GA[11]	GPS
6:08 a.m.	Driver fuels in Valdosta, GA	Fuel Receipt
6:31 a.m.	Driver resumes driving Valdosta, GA	GPS

[4] See Human Performance Attachment 3: Accident Trip Bill of Lading
[5] Estimated distance from location of breakdown to repair shop is 3.7 miles.
[6] See Human Performance Attachment 4: Accident Trip Fuel Receipts.
[7] See Human Performance Attachment 4: Accident Trip Fuel Receipts.
[8] See Human Performance Attachment 5: Accident Trip Scale Tickets.
[9] Vehicle recorded at truck stop 74 miles from Corbin, KY.
[10] Vehicle recorded on highway 59.61 miles from previous location.
[11] Vehicle recorded at truck stop 63.54 miles from previous location.

Wednesday, June 24, 2015 (continued)		
6:45 a.m.- 7:01 a.m.	Vehicle location recorded in rest area Jennings, FL	GPS
7:56 a.m.- 8:09 a.m.	Vehicle location recorded in rest area Lake City, FL	GPS
8:22 a.m.	Vehicle location recorded on highway, Alachua, FL[12]	GPS
9:28 a.m.- 2:41 p.m.	Vehicle location recorded on highway in Wildwood, FL[13]	GPS
10:00 a.m.	Driver issued traffic citation Wildwood, FL	Florida Traffic Citation[14]
2:41 p.m.	Driver resumes traveling, Wildwood, FL	GPS
4:50 p.m.	Vehicle location recorded at truck stop in Haines City, FL	GPS/Driver Interview
6:22 p.m.	Driver sends a text message	Cellphone Device
Thursday, June 25, 2015		
Time	Event	Source
12:30 a.m.	Vehicle position recorded in Haines City, FL	GPS
4:30 a.m.	Driver wakes up/begins his work day	Driver Interview
5:16 a.m.	Vehicle departs truck stop in Haines City, FL	GPS
5:32 a.m.	Vehicle location recorded at shipper in Haines City, FL	GPS
7:45 a.m.	Driver departs shipper in Haines City, FL	GPS
9:12 a.m.- 9:20 a.m.	Vehicle location recorded in rest area in Wesley Chapel, FL[15]	GPS
12:02 p.m.	Vehicle location recorded at truck stop in Jasper, FL.[16]	GPS
12:10 p.m.	Driver purchases meal in Jasper, FL	Food Receipt
12:30 p.m.	Driver continues traveling in Jasper, FL	GPS
12:47 1:10 p.m.	Vehicle location recorded in rest area in Lake Park, GA[17]	GPS
1:23 p.m.- 1:41 p.m.	Vehicle location recorded in a truck stop in Valdosta, GA[18]	GPS
4:33 p.m.	Vehicle location recorded on a highway in Jonesboro, GA[19]	GPS
6:21 p.m.- 6:23 p.m.	Vehicle location recorded in a rest area in Adairsville, GA[20]	GPS

[12] Vehicle recorded on highway 15.36 miles from previous location.
[13] The GPS lists the location as Lady Lake, FL, the closest city.
[14] See Human Performance Attachment 6: June 23, 2015 Florida Traffic Citation.
[15] Vehicle recorded in a rest area 70 miles from previous location.
[16] Vehicle recorded in a truck stop 158.2 miles from previous location.
[17] Vehicle recorded in a rest area 17.98 miles from previous location.
[18] Vehicle recorded in a truck stop 7.8 miles from previous location.
[19] Vehicle recorded on a highway 205.95 miles from previous location.

Thursday, June 25, 2015 (continued)		
7:10 p.m.	**Accident Occurs Chattanooga, TN**	911 Records

1.2. Medical Factors

Of interest to the investigation is how the driver's health may have influenced his ability to operate the motor vehicle. This section describes the general health of the accident driver and describes in detail any medical issues which may have contributed to the crash.

1.2.1. General Health

The accident driver was a 39 year old male. Information regarding his health was obtained through an interview with the driver, medical and prescription records, and his most recent Commercial Motor Vehicle Driver Fitness Determination Exam. In an interview with NTSB investigators, the accident driver described his health as good. However, he also stated that he was previously diagnosed with high blood pressure and because at the time of the crash he did not have health insurance, he was not under a treatment regimen. Pharmacy records suggest the accident driver was last prescribed medication for high blood pressure in November 2008. He was issued a prescription for a 20 milligram dosage of Lisinopril[21]. At the time of the most recent Commercial Motor Vehicle (CMV) medical certification, (November 21, 2014) his blood pressure was reported to be 138/88, within normal limits. The driver also stated that he had previously injured his back and was prescribed pain medications but is no longer taking the medication.

1.2.2. Medical Examination Report for Commercial Motor Vehicle Driver Fitness Determination (CDL Medical Exam)

Commercial drivers in the United States are required by *Federal Motor Carrier Safety Regulations* (FMCSRs) to be medically certified as being physically qualified to drive a commercial vehicle.[22] These examinations may result in one of four outcomes with respect to medical qualification:

- The driver is found to meet the standards in 49 *Code of Federal Regulations* (CFR) §391.41 and is given a 2-year certificate;[23]
- The driver is found to meet the standards, but requires periodic evaluation for one or more conditions and is qualified for 3 months, 6 months, or 1 year;
- The driver is temporarily disqualified due to a condition or medication; or;
- The driver is found not to meet the standards.

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[20] Vehicle recorded in a rest area 64.88 miles from previous location

[21] Lisinopril is an angiotensin converting enzyme inhibitor used to treat hypertension, congestive heart failure and in treatment following a heart attack event.

[22] 49 Code of Federal Regulations §391.41.

[23] For more information on who must be examined and the examination process, please see 49 CFR §391.43 and 49 CFR §391.45.

1.2.2.1. Most Recent CDL Medical Exam

The accident driver's most recent Commercial Driver Fitness Determination Examination was on November 21, 2014. The exam was conducted by a Nurse Practitioner at a Department of Transportation (DOT) medical testing facility in London, Kentucky.

In the self-reporting health history section on the report, the driver indicated "No" to all items in the health history section. There was no further information provided in this section. The Medical Examiner's Comments on the Health History section of the report, indicates the medical examiner "must review and discuss with the driver any yes answers and potential hazards of medications, including over-the-counter medications, while driving". The medical examiner wrote "0 meds, overall healthy".

The driver's height was recorded as 70 inches and his weight was recorded as 198 pounds. This corresponds to a Body Mass Index (BMI) of 28.4%.[24]The driver's blood pressure was recorded as 138/88, his pulse rate was 98 and regular. A urinalysis showed no protein, blood, or sugar. A physical exam noted no abnormalities in any of the driver's body systems.

1.2.3. Vision

In the driver's most recent CDL Medical Exam, the accident driver's corrected Snellen visual acuity was recorded to be 20/25 in the left eye, 20/25 in the right eye, and 20/25 in both eyes.[25] His horizontal field of vision was recorded as 70 degrees for both the right and left eyes. The driver was able to recognize and distinguish among traffic control signals and devices showing standard red, green, and amber colors. The driver was not found to have had monocular vision. The examiner indicated that the driver meets visual acuity requirements only when wearing corrective lenses. The driver did not have a corrective lens restriction on his Kentucky Commercial Driver's License. The driver stated in an interview with NTSB investigators, he was wearing eye glasses when the crash occurred.

1.2.4. Hearing

In the accident driver's most recent CDL Medical Examination, he was reported to have been able to hear a forced whispered voice at five feet in each ear. The driver reported no difficulties in hearing in an interview with NTSB investigators.

1.2.5. Medications (Prescription, Over-the-Counter, Other)

There were four bottles of prescription medication found in the 2007 Peterbuilt following the crash. The medications were not scheduled narcotics and belonged to the passenger's children. There were no recent medication prescriptions found in records from the driver's physician or in records from pharmacies in the area of the driver's residence. A query for

[24] For BMI information, see: http://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmicalc.htm .

[25] Snellen fractions are a measure of visual acuity (sharpness of sight). In the Snellen fraction, the first number represents the test distance (20 feet) and the second represents the distance at which the average eye could see the letters on a certain line of the chart. A fraction of 20/20 is considered normal vision.

prescription medications was conducted in the Kentucky All Schedule Prescription Electronic Reporting (KASPER)[26] system and the Tennessee Controlled Substance Monitoring Database (CSMD)[27]. No prescriptions were found within the past 12 months.

Following the crash, investigators found a partially used bottle of *Advanced Detox Solutions Immediate Cleanser 2* among the driver's personal belongings in the sleeper berth of the accident truck.[28] In an interview with NTSB investigators, the accident driver stated that the substance wasn't his and he didn't know where it came from.

1.2.6. Drug Use Evaluation and Classification

The Drug Evaluation and Classification (DEC) program is a systematic and standardized process used to identify signs of impairment by one or more categories of drugs. Law enforcement officers who have completed training in the program are certified as Drug Recognition Experts (DREs). The DRE program was originally developed by the Los Angeles Police Department (LAPD) in the early 1970's. In the 1980's the program was validated through scientific research by the LAPD and the National Highway Traffic Safety Administration (NHTSA). Currently, the DRE program training and guidelines are administered internationally through the corroboration of NHTSA and the International Association of Chiefs of Police. Following the crash at 9:15 p.m., Chattanooga police investigators requested a DRE from a neighboring jurisdiction to evaluate the accident driver. The DRE officer's observations and the determination of impairment are described in the sections below.

1.2.6.1. Initial Observations

The DRE Exam began at 9:50 p.m., approximately two and a half hours after the crash. The DRE officer observed that there was no odor of an alcoholic beverage coming from the accident driver; a test for breath alcohol was negative.[29] The driver was observed to have a bump on his head and he complained of having a sinus infection and allergies. When asked, the driver stated that he was not sick or injured and that he was not under a doctor's care. The driver was observed to have redness of both nares. The oral cavity was clear with redness to the back of the throat. The driver's demeanor was noted to be cooperative initially, but as the exam progressed, he became agitated, argumentative and insulting.

1.2.6.2. Clinical Indicators of Impairment

To identify clinical indicators of impairment, the DEC process examines the test subject's pulse rate, blood pressure, and functions of the eyes. These functions are measured in comparison with an average range of healthy, non-impaired subjects.

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[26] Kentucky All Schedule Prescription Electronic Reporting (KASPER) is an electronic data base which tracks controlled substance prescriptions dispensed within the state showing all scheduled prescriptions for an individual over a specified time period, the prescriber and the dispenser.

[27] The Tennessee Controlled Substance Monitoring Database monitors all scheduled prescriptions within the state

[28] According to the manufacturer *Advanced Detox Solutions Immediate Cleanser 2* is used to quickly flush toxins from the body. An online search of the product suggests it is commonly used to mask drug metabolites during urinalysis drug test; there was no scientific research found indicating its effectiveness.

[29] The accident driver was administered a breath alcohol test on a CMI Inc., Intoxilyzer at 9:16 p.m. The results of the test were 0.00 gm/ml.

1.2.6.2.1. Vital Signs

The driver's pulse rate was recorded at three separate times during the evaluation; 110 beats per minute (bpm) at 10:01 p.m., 110 bpm at 10:19 p.m., and 108 bpm at 10:36 p.m.[30] The driver's blood pressure was recorded to be: systolic 174, mmHg diastolic 130 mmHg. [31]

1.2.6.2.2. Eye Examination

The DRE officer observed that the accident driver wore prescription eye glasses. His eyes were "bloodshot and watery". Pupil size and tracking were observed to be equal. Horizontal and vertical nystagmus was observed in each eye.[32] More specifically, the lack of smooth pursuit was observed in each eye and horizontal nystagmus at maximum deviation was observed in the right eye.[33] Moderate pupillary lack of convergence was present.[34] Pupillary unrest and rebound dilation was not observed. [35] [36] Pupil size and reaction to light were examined in three lighting conditions, room light (7.0 mm), near total darkness (9.5mm), and in direct light (6.0 mm).[37] Reaction to light was observed to be normal.

1.2.6.3. Psychophysical Indicators of Impairment

The DEC process determines impairment through a series of psychophysical tests. The tests require the subject to concentrate on a mental task while performing a physical task. These tests are designed to mimic the cognitive demands associated with operating a motor vehicle as they require the subject to concentrate on more than one thing at a time. (mental tasks and physical tasks).

There were four psychophysical tests administered to the accident driver in the DEC process: the Romberg Balance Test, the Walk and Turn Test, the One Leg Stand, and the Finger to Nose Test. All of the tests are widely used as Standardized Field Sobriety Tests (SFSTs). With the exception of the Romberg Balance Test and the Finger to Nose Test, the tests have been validated through a scientific study and found to be highly accurate and reliable in identifying

[30] The DRE average pulse range for healthy, unimpaired individuals is 60-90 bpm.
[31] The DRE average blood pressure range for healthy, unimpaired individuals is: systolic 120-140 mm Hg, diastolic 70-90 mm Hg.
[32] Horizontal Gaze Nystagmus (HGN) and Vertical Gaze Nystagmus (VGN) are two standardize field sobriety tests designed to identify involuntary twitching of the eyel while the test subject tracks the movement of a stimulus. The test has been widely accepted as an indicator of impairment for certain drug categories.
[33] Maximum deviation of the eye is reached when the iris is moved vertically to its furthers point away from the nose.
[34] Lack of convergence is the inability of a person's eyes to converge, or "cross" as the person attempts to focus on a stimulus as it is pushed slowly toward the bridge of his or her nose.
[35] Pupillary unrest is the continuous, irregular change in the size of the pupils that may be observed under room or steady light conditions.
[36] Rebound dilation is a period of pupillary constriction followed by a period of pupillary dilation where the pupil steadily increases in size and does not return to its original constricted size.
[37] The DRE average pulse range for healthy, unimpaired individuals is 2.5-5.0 mm for room light, 5.0-8.5 mm for near total darkness, and 2.0-4.5 for direct light.

impairment when administered in a standardized manner. [38] The driver's performance on the tests is described in the sections below.

1.2.6.3.1. Romberg Balance Test

The Romberg Balance Test is designed to evaluate a subject's ability to follow complex instructions, maintain balance, and their ability to estimate the passage of time. The subject is also evaluated for involuntary or reflexive movements. A subject's performance of these tasks can be an indication of impairment.

The driver was instructed to stand with his feet together and while maintaining his hands at his side, tilt his head rearward with his eyes closed. He was then asked to estimate the passage of 30 seconds. While performing the test, the DRE officer observed that driver experienced eyelid and body tremors. He estimated the passing of 30 seconds as 27 seconds. No swaying was observed.

1.2.6.3.2. Walk and Turn Test

The Walk and Turn Test is divided into two stages: the instruction stage and the walking stage. In the instructions stage, the subject must stand with their feet in a heel to toe position, keep their arms at their sides, and listen to the instructions. While doing so, they must keep their arms at their side. The instruction stage divides the subject's attention between maintaining balance and processing the instructions of the test. In the walking stage, the subject must take nine heel to toe steps along a line on the ground, turn in a prescribed manner, and take nine heel to toe steps back on the line in the direction they came from.[39] As they step, they must count each step out loud, and watch their feet.

During the instruction phase, the accident driver was unable to maintain his balance and stepped out of balance with his left leg to keep from falling. During the walking stage, the accident driver missed stepping heel to toe between steps five and six and raised his right arm for balance on steps two, four, and seven. While turning to take the second set of nine steps, he was not able to turn in the prescribed manner. He completely stepped off the line, took two steps away from the line, and turned by stepping with both feet. He then stepped back on the line before continuing the test. During the second set of nine steps, the driver raised both arms for balance on steps three and four and missed stepping heel to toe between steps eight and nine.

1.2.6.3.3. One Leg Stand

The One Leg Stand test is divided into two stages: the instruction stage and the counting and balance stage. In the instruction stage, the subject must stand with their feet together, keep their arms along their sides, and listen to instructions. In the balance and counting stage the subject must raise one foot (as directed) approximately six inches off the ground with both legs straight and the raised foot parallel to the ground. While looking at the elevated foot, they must

[38] J. Stuster, M. Burns, *Validation of the Standardized Field Sobriety Test Battery* at August 1998 BACs Below 0.10 Percent

[39] After taking nine steps, the subject is instructed to turn by pivoting on his left foot while taking short steps with his right foot and then take nine more steps in the direction they came from.

count out loud in a prescribed manner. The subject's attention is divided between maintaining balance and counting.

The accident driver was administered the test first with his right foot elevated and then with the left foot elevated. He was given complete instructions before each foot was elevated. While standing with his right foot elevated, the driver put his foot down while counting at two, three, and four seconds. He used his arms for balance, swayed during the test, and did not count as instructed. As he counted out loud, he repeated the same number on three occasions. While standing with his left foot elevated, the driver raised his arms for balance, swayed throughout the test, and did not count as instructed.

1.2.6.3.4. Finger To Nose Test

The Finger To Nose Test is designed to identify signs of impairment by testing the subject's ability to perform tasks requiring fine motor skills during a divided attention task. The subject is instructed to stand with their feet together and their arms at their sides. They are then asked to close their eyes and tilt their head rearward. The subject is told which hand he is to use to touch the tip of their nose. Afterwards, the subject is to automatically lower his hand. He is then given another command.[40] The subject is asked to do so three times with each hand.

When the accident driver was administered the test, he missed the tip of his nose on all six attempts. Despite instructions to use the tip of his finger, he used the pad of the finger on each occasion. On attempts one, two, and four, the driver missed his nose completely. The DRE officer also observed eyelid and body tremors during the test.

1.2.6.4. DRE Opinion

At the conclusion of the DEC evaluation, the DRE officer reached the conclusion that the accident driver was under the influence of a Central Nervous System (CNS) Stimulant and a CNS Depressant.

1.2.7. Toxicology

Because the use of certain drugs has the ability to impair a driver's level of alertness, judgment, reaction time, or behavior, toxicology findings of the driver's system is of interest to the investigation. Toxicology test results from multiple sources were examined to establish the driver's condition at the time of the crash as well as a history of drug use.

1.2.7.1. Court Ordered Toxicology Test Results

On May 8, 2015 the accident driver was administered hair analysis drug test[41] at a commercial laboratory facility in London, Kentucky. The test was administered as directed by court order for a matter not related to this investigation. An analysis was completed on May

[40] The order the subject was instructed to touch is nose was: left, right, left, right, right, left.

[41] Hair analysis drug testing detects drug and drug metabolites incorporated into the hair matrix from the bloodstream following drug use. The test has a detection window of about 90 days following the drug use. *"Operator Drug-and Alcohol-Testing Across Modes, A synthesis of Safety Practice"* Transportation Research Board, 2011, Washington, DC.

15, 2015. The driver tested positive for amphetamine and methamphetamine. The driver tested negative for:

- cocaine
- opiates
- phencyclidine
- marijuana

1.2.7.2. Pre-employment Toxicology Results

On June 16, 2015 the accident driver was administered a urinalysis drug test as a condition of employment by the Cool Runnigs Express Inc., the accident carrier. The test was given by a commercial laboratory in London, Kentucky in accordance with the requirements of Department of Transportation (DOT) rule 49 Code of Federal Regulations (CFR) Part 40.[42] The driver tested negative for:

- amphetamines
- cocaine
- opiates
- phencyclidine
- 6-acetylmorphine
- marijuana

1.2.7.3. Post-Crash Toxicology Test Results

A specimen of blood was obtained from the accident driver by Chattanooga police investigators on June 25, 2015, following the crash. The sample was sent to the Tennessee Bureau of Investigation for drug testing and analysis. The driver tested positive for Methamphetamine (amount: 0.08 ug/ml) and Amphetamine (amount: less than 0.05 ug/ml). The driver tested negative for:

- barbiturate
- cannabinoid
- cocaine
- opiates

[42] 49 CFR Part 40 describes procedures for conducting workplace drug and alcohol testing for safety sensitive transportation employees.

1.2.7.4. Post-Crash DOT Toxicology Results

On June 27, 2015 the motor carrier, Cool Runnings Express Inc., directed the accident driver to take a post-crash urinalysis drug test. The drug test was administered approximately 38 hours following the crash.[43] The driver tested negative for:

- amphetamines
- cocaine
- opiates
- phencyclidine
- Marijuana
- 6-acetylmorphine
- marijuana

1.2.7.1. Alcohol and Drug Consumption

Officers from the Chattanooga Police Department contacted the accident driver shortly after the crash occurred. A drug recognition expert (DRE) performed an evaluation of the physical condition of the accident driver.[44] A roadside alcohol test indicated the driver was not under the influence of alcohol at the time of the crash. Because the accident driver refused to fully cooperate during the exam, the DRE determination of the driver's drug influence was inconclusive.

1.2.8. Psychological Factors

The driver stated that he had been recently under stress because he has not been able to find employment and he has been going through a child custody dispute with his ex-wife. However, the driver's account of his actions and the circumstances surrounding the crash do not suggest that the crash occurred as the result of an intentional act.

1.2.9. Sleep Habits

A focus of the investigation is what influence fatigue may have had on the driver's performance in the crash. Because the driver was unable to provide a detailed account of his activities and he failed to record his duty status, several sources of information were explored to determine his availability for rest.

1.2.9.1. Sleep Quality

In an interview with NTSB investigators, the accident driver stated that he has not been diagnosed with any sleep disorders and generally sleeps well. He stated he typically does not use sleep aids and can easily fall asleep. In preparation for the accident trip, four days prior to the crash, the driver moved his belongings into the accident truck and began sleeping there. He utilized a mattress from his home and slept well.

[43] 49 CFR §382.303 requires a driver to be administered a controlled substance test following a motor vehicle accident which results in the loss of human life within 32 hours following the accident.

[44] A drug recognition expert (DRE) is a police officer trained to recognize impairment in drivers under the influence of drugs other than, or in addition to, alcohol.

1.2.9.2. Sleep Opportunity

As a result of the driver failing to record his duty status, available information was used to determine his opportunity for rest. (See Section 1.1) The driver's opportunity for sleep is displayed in Table 2.

Cumulative information shows that on Monday, June 22 the driver got up at 10:00 a.m. in London, Kentucky. He departed London, Kentucky at about 12:30 p.m. to pick up a load of produce in Horse Cave, Kentucky. Upon arriving at the shipper, the truck experienced a mechanical breakdown. After having the truck temporarily repaired, the driver entered the sleeper berth at 7:30 p.m. where he had approximately a 6 hour opportunity for rest.

The driver began work the next day, Tuesday, June 23 at 2:26 a.m. and returned to London, Kentucky to have repairs to the truck completed. The driver left London, Kentucky around 7:00 p.m. and continued traveling until he reached Haines City, Florida on Wednesday, June 24 at 4:27 pm. In an interview with NTSB investigators, the driver stated he stopped and rested along the way, but was not able to provide specific times in which he rested. During this segment of the trip, the driver traveled for 38 hours.

After being off-duty for 12 hours, the driver began working at 4:30 a.m. This was the driver's last opportunity for rest before the crash occurred. At the time of the crash, the driver had been working for approximately fourteen and a half hours.

Table 2. 2013 Peterbilt Driver's Opportunity for Rest

From		To		
Date	Time	Date	Time	Elapsed Time
6/22/15	7:32 p.m.	06/23/15	02:26 a.m.	6 hrs 54 min
6/23/15	None	None	-	-
6/24/15	6:22 p.m.	06/25/15	4:30 a.m.	10 hrs. 13 min.
6/25/15	None	None	-	-

1.3. Operational Factors

1.3.1. Licensing

The accident driver held a valid Kentucky Class A Commercial Driver License (CDL) with a tanker endorsement.[45] [46] The license was issued on September 26, 2013 with an expiration

[45] A Kentucky Commercial Class A Driver License permits the holder to operate, in commerce, a vehicle with a gross vehicle weight rating (GVWR) of 26,001 pounds or more in combination with a trailer with a GVWR of 10,001 pounds or more.

[46] A tanker endorsement is required to operate a vehicle requires a Class A or B CDL carrying a liquid or liquid gas in a tank or tanks having an individual rated capacity of more than 119 gallons and an aggregate rated capacity of 1000 gallons or more that is either permanently or temporarily attached to the vehicle or the chassis or a Class C vehicles when the vehicle is used to transport hazardous materials in liquid or gas form in a previously described rated tanks.

date of December 26, 2016. At the time of issuance, the driver was medically certified to operate a commercial motor vehicle.[47]

1.3.2. Commercial Driving Experience

The accident driver's Driver Qualification File (DQ File), maintained by the accident carrier, indicates he had previous experience operating truck tractors. Prior to working for the accident carrier, he drove truck tractors long distance for approximately 5 months and locally for 12 years. The driver reported on the accident carrier's employment application that he left the previous job after being involved in a commercial motor vehicle (CMV) crash.

1.3.3. Driving History

Information relevant to the 2007 Peterbilt driver's license history was obtained from several sources. The driver's Kentucky Driving History Records; the Commercial Driver License Information System (CDLIS); a Commercial Motor Vehicle Inspection Report; and the National Driver Registry (NDR) were examined. Each source of information is discussed in the sections below; the cumulative information is represented in Table 3.

1.3.3.1. Kentucky Driving History Records

The Kentucky Transportation Cabinet issues two types of driver license reports; a three-year driving history record and a five-year driving history record.[48] The three-year driving history record can be obtained by anyone through a state operated website by registering for service and paying a fee. The report includes driver status, license expiration, driving restrictions and traffic violations which occurred during the three year period preceding the request. The five-year driving history can be obtained by the driver in person at a Kentucky Driver Licensing Field Office. The report contains the driver's personal identifying information and includes driver status, license expiration, driving restrictions, violations, and accidents which occurred during the five year period preceding the request.

The 2007 Peterbilt driver's three-year driving history report lists a single moving violation, exceeding the speed limit by 16-24 MPH over the speed limit. In addition to the speeding violation, the five-year driving history record contains seven motor vehicle accidents; three of which were in CMV's. In an interview with NTSB investigators, the owner of Cool Runnings, the accident carrier, stated when he hired the accident driver, he obtained the three-year driver history report.

[47] 49 Code of Federal Regulations §391.41 requires that a person who operates a commercial motor vehicle in commerce be medically certified as physically qualified to operate such vehicles.
[48] See Human Performance Attachment 8: 2007 Peterbilt Driver Kentucky Driving History Records.

1.3.3.2. Commercial Driver License Information System (CDLIS)

According to the CDLIS report dated June 26, 2015, the driver has one violation on his driving record; speeding 16-25 MPH over the speed limit.[49] [50] The report also shows the driver was involved in seven motor vehicle accidents; three of which were in CMV's.

1.3.3.3. Commercial Motor Vehicle Inspection Report.

A review of the Kentucky State Police Commercial Vehicle Enforcement inspection database indicates 2007Peterbilt driver underwent a Commercial Vehicle Safety Alliance (CVSA) North American Standard Level III roadside inspection on November 14, 2012 in Somerset, Kentucky. [51] The inspection report indicates that the driver was cited for speeding, 15 or more miles per hour over the speed limit, (71 MPH in a 55 MPH zone) and using a hand-held mobile telephone while operating a CMV[52]. The report further indicates that the driver was issued traffic citations for these violations however; the violations do not appear elsewhere in his driving history.

1.3.3.4. National Driver Registry (NDR)

A query of the NDR found no indication that the 2007 Peterbilt driver had been listed in the Problem Driver Point System (PDPS). [53] Although the accident driver had numerous entries in his Kentucky driving history record and CDLIS, none of the entries met the criteria for inclusion in the NDR database.[54]

Table 3: 2007 Peterbilt Driver Driving History Information

Date	Event	Source
2/25/11	Accident CMV/Hazmat	Kentucky 5 year Driving History Record, CDLIS
2/26/11	Accident CMV	Kentucky 5 year Driving History Record, CDLIS
11/23/11	Accident – non-CMV	Kentucky 5 year Driving History Record, CDLIS
11/14/12	CMV Violation – Speeding 16 MPH over the Speed Limit	CMV Inspection Report

[49] The Commercial Driver's License Information System (CDLIS) is a nationwide computer system that enables state driver licensing agencies to ensure commercial drivers have only one driver's license and a complete driver record.
[50] See Human Performance Attachment 9: 2007 Peterbilt Driver CDLIS Report.
[51] A CVSA Level III inspection includes an inspection of CMV operator's driver's license, medical examiner's certificate and Skill Performance Evaluation (SPE) Certificate, driver's record of duty status/ hours of service, seat belt usage, and motor vehicle law compliance.
[52] See Human Performance Attachment 10: Commercial Motor Vehicle Inspection Report
[53] The National Driver Registry is a database maintained by the National Highway Traffic Safety Administration (NHTSA) which compiles information from state licensing authorities to ensure individual driver licensing information are complete and accessible to all jurisdictions.
[54] All 51 US Jurisdictions submit information on individual driving records into the NDR data base for drivers whose license has been revoked, suspended, canceled or denied or who have been convicted of serious traffic-related offenses.

11/14/12	CMV Violation – Using hand held phone while operating a CMV	CMV Inspection Report
12/7/12	Accident – non-CMV	Kentucky 5 year Driving History Record, CDLIS
4/4/13	Accident – non-CMV	Kentucky 5 year Driving History Record, CDLIS
7/22/13	Accident – non-CMV	Kentucky 5 year Driving History Record, DQ File KC Transportation Inc., CDLIS
12/10/14	Citation – 16-24 MPH over Speed Limit	Kentucky 3 Year Driving History Record, Kentucky 5 year Driving History, CDLIS
2/25/15	Accident – CMV	Kentucky 5 year Driving History Record, CDLIS
6/24/15	Accident CMV, Citation – Careless Driving	Florida Traffic Crash Report

1.3.4. Training

The accident driver stated that he learned to drive commercial vehicles while employed at his father's business and obtained his CDL at age 21. He did not attend formal driver training when he initially obtained his CDL. He did not undergo driver training prior to beginning employment with the accident carrier. A DQ File from a previous carrier shows that in April 2002 the driver was given a road test which evaluated his ability to perform skills essential to operating a truck tractor. The driver demonstrated that he was proficient.

1.3.5. Route Experience

The accident driver stated that he had not previously driven the accident route. He stated that he used a smart phone to navigate his way on the trip.

1.4. Environmental Factors

Global Positioning System (GPS) coordinates were used to determine relevant environmental conditions for the accident location.

Latitude: N 35.086740
Longitude: W -85.066480

1.4.1. Weather Information

Weather conditions at the time and location of the crash were recorded to understand what influences the environment may have had on the accident driver's performance in the crash. Because the air condition system stop working along the accident trip, weather conditions at locations where the driver had the opportunity to obtain rest were also recorded to understand if environmental conditions could have affected his sleep quality. Environmental conditions at these locations are recorded in the sections below.

1.4.2. Weather Information (Wildwood, FL)

Historical data for weather station KLEE (Leesburg Airport) located on 8807 Airport Boulevard Leesburg, FL, approximately 17 miles from the location of a minor crash in Wildwood, FL which occurred on Wednesday June 24, 2015.

Table 4. Weather Data from Leesburg Airport (KLEE)

Time (EST)	8:53 a.m.	11:53a.m.	1:53 p.m.
Temperature	82.9° F	87.1° F	91.0° F
Heat Index	97.4° F	96.9° F	97.6° F
Dew Point	70.0° F	71.1° F	71.1° F
Humidity	65%	59%	52%
Pressure	30.17 in	30.17 in	30.14 in
Visibility	10 mi	10 mi	10 mi
Wind Dir.	SSW	SSE	SW
Wind Speed	4.6 mph	4.6 mph	8.1 mph
Wind Gust Speed	N/A	N/A	N/A
Precipitation	N/A	N/A	N/A
Conditions	Clear	Clear	Clear

1.4.2.1. Weather Information (Haines City, FL)

Historical data for weather station KBOW (Bartow Municipal Airport) located at 5001 US Highway 17 North Bartow, Florida, approximately 12 miles from a truck stop where the driver parked while off duty on June 24 through June 25, 2015.

Table5. Weather Data from Bartow Municipal Airport (KBOW)

Time (EST)	**June 24, 2015**	4:47 p.m.	11:15 p.m.	**June 25, 2015**	3:15 a.m.
Temperature		80.6° F	71.6° F		73.4
Heat Index		83.9° F	N/A		N/A
Dew Point		69.8° F	71.6° F		73.4
Humidity		70%	100%		100%
Pressure		30.11 in	30.16 in		30.12 in
Visibility		10 mi	1 mi		10 mile
Wind Dir.		WSW	NE		Calm
Wind Speed		11.5 mph	18.4		Calm
Wind Gust Speed		N/A	32.4		N/A
Precipitation		N/A	Rain, Thunderstorm		N/A
Conditions		Mostly Cloudy	Heavy Thunderstorms		Clear

Historical data for weather station KCHA (Chattanooga Airport) located on 1001 Airport Road Chattanooga, Tennessee, approximately 8.1 miles from the crash site, was retrieved and examined. Observations for June 25, 2015, near the time of the accident, are shown in Table 4.[55]

[55] Data obtained from http://www.wunderground.com.

Table 6. Weather Data from Chattanooga Airport (KCHA)

Time (EST)	6:53 p.m.	7:53p.m.
Temperature	93.0° F	91.9° F
Heat Index	97.4° F	96.9° F
Dew Point	68.0° F	69.1° F
Humidity	44%	47%
Pressure	29.96 in	29.95 in
Visibility	10 mi	10 mi
Wind Dir.	Calm	WNW
Wind Speed	Calm	5.8 mph
Wind Gust Speed	N/A	N/A
Precipitation	N/A	N/A
Conditions	Scattered Clouds	Partly Cloudy

1.4.3. Astronomical Data for June 25, 1015

Using the GPS coordinates listed above, astronomical data for the accident location and date was downloaded from the United States Naval Observatory[56] (USNO). Downloaded astronomical data is summarized in the table below.

Table 5. Sun and Moon Date for Chattanooga, TN for June 25, 2015

Event	Time
ACCIDENT	**7:14 p.m.**
Begin civil twilight[57]	5:59 a.m.
Sunrise	6:28 a.m.
Sun Transit	1:44 p.m.
Sunset	8:59 p.m.
End civil twilight	9:29 p.m.

1.5. Task Factors

1.5.1. Crash Trip

The trip originated in Horse Cave, Kentucky on Monday, June 22, 2015. The driver was traveling to Haines City, Florida to deliver a load of produce. The approximate distance of the trip was 770 miles. When the driver arrived to pick up the freight, the truck had a mechanical breakdown. A temporary repair was made and the driver returned to the carrier in London, Kentucky to complete the repair. After the repair was made, the driver departed London, Kentucky with the load on Tuesday, June 23 around 7:00 p.m. The driver traveled through the night on Tuesday and arrived in Wildwood, Florida Wednesday morning, June 24. While in Wildwood, the driver was involved in a minor collision with another commercial vehicle. As a result of that collision, the truck was damaged and needed a roadside repair in order to continue. The repair was made however, the truck air conditioner no longer worked. The driver decided to return to London, Kentucky to have the air conditioner repaired after he delivered his load.

[56] Data obtained form http://aa.usno.navy.mil/rstt/onedaytable?form=1&ID=AA&year=2015&month=2&day=24&state=CA&place=Oxnard

[57] Morning civil twilight begins when the geometric center of the sun is 6° below the horizon and ends at sunrise.

The driver reached the load destination on Wednesday, June 24 around 4: 30 p.m. however; he was late for the scheduled delivery time. The driver parked at a nearby truck stop and went off-duty for approximately 12 hours. The next morning, June 25, the driver delivered his load and departed Haines City, Florida at approximately 8:00 a.m. The driver continued traveling until the crash occurred at 7:05 p.m. At the time of the crash, the driver had been working for approximately fourteen and a half hours

1.6. Workload/Distraction

At the time of the crash, the driver was traveling with his girlfriend in the accident truck. Information obtained in the investigation suggests that his girlfriend is not licensed to operate the accident truck and was along for companionship. At the time of the crash, the driver's girlfriend stated she was asleep in the sleeper berth.

1.6.1. Vehicle Familiarity

The accident driver began employment with the carrier three days prior to the crash. Although he had not driven the accident vehicle prior to that time, he had driven vehicles similar in size and operational characteristics.

1.6.2. Cell Phone Use

Data from the driver's cell phone show that the phone was used frequently at times when the vehicle was in motion. However, the driver and his passenger stated in an interview with staff that they shared the phone and he did not use the phone while driving. There was not information found which would have identified who was using the phone at a specific time. Data retrieved from the cell phone indicates it was not in use when the crash occurred.

2. Investigative Interviews

In order to gain understanding of the accident driver's behavior relevant to this crash, interviews were conducted of the accident driver, a passenger in the accident vehicle, and a motorist who witnessed the accident vehicle just prior to the crash. Summaries of the interviews are highlighted in the sections below.

2.1. 2007 Peterbilt Driver

NTSB investigators interviewed the accident driver on June 30th 2015 at the motor carrier base. When questioned about the moments just prior to the crash, the accident driver stated that as was traveling northbound on I-75 in the center lane. He heard mention of road construction through on a citizens band (CB) radio.[58] He stated he did not see any signs warning of highway construction. He stated about the time he heard about the road construction, he observed several cars ahead of him spin out and the car in front of him suddenly stopped. Realizing he couldn't stop, he looked in his left side view mirror. Seeing no vehicles beside his truck, he jerked the

[58] The Citizens Band (CB) Radio Service is a private, two-way, short-distance voice communications service for personal or business activities of the general public. Available from: https://www.fcc.gov/general/citizens-band-cb-service.

wheel towards the left. When asked if he applied his brakes, he responded "I hope I did." When asked further about applying his brakes, he indicated that it happened so fast he didn't remember. He stated he didn't remember anything after the collisions occurred.

2.2. Witness

NTSB investigators interviewed a driver who was traveling north on I-75 and observed the accident driver and his activities just prior to the crash.[59]

The witness stated moments prior to the crash, he was driving north on I-75 at Volkswagen Drive, in the right lane, when he observed the accident truck approach from the rear and pass him. The accident truck was in the middle lane traveling 75-80 MPH. As the accident truck passed the witness, he saw a female seated in the passenger seat. After the accident truck passed him, he saw the truck make several lane changes, moving to and from the left travel lane. As the accident truck approached exit 11, the witness observed that traffic ahead had stopped. The accident truck did not appear as if it was going to stop because the brake lights did not come on and the witness pulled over to the shoulder as he reached the exit ramp. As the witness stopped his vehicle, the crash occurred. The witness remembers seeing highway signs warning of road construction ahead as he approached to crash site..

E. DOCKET MATERIAL

The following attachments are included in the docket for this investigation:

LIST OF ATTACHMENTS

Human Performance Attachment 1 Accident Vehicle GPS Download

Human Performance Attachment 2 2007 Peterbilt Driver Interview Transcript

Human Performance Attachment 3 Accident Trip Bill of Lading

Human Performance Attachment 4 Accident Trip Fuel Receipts

Human Performance Attachment 5 Accident Trip Scale Tickets

Human Performance Attachment 6 June 23, 2015 Florida Traffic Citation

Human Performance Attachment 7 June 23, 2015 Vehicle Repair Invoice

Human Performance Attachment 8 2007 Peterbilt Driver Kentucky Driving History Records.

Human Performance Attachment 9 2007 Peterbilt Driver CDLIS Report

Human Performance Attachment 10 Commercial Motor Vehicle Inspection Report

[59] See Human Performance Attachment 11: Witness Interview Transcript.

Human Performance Attachment 11 Witness Interview Transcript

Human Performance Attachment 12 Drug Recognition Expert Evaluation

END OF REPORT

Kenneth J. Bragg
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