HUMAN PERFORMANCE FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

Oxnard, CA

HWY15MH006

(11 pages)

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

HUMAN PERFORMANCE FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

CRASH INFORMATION

Location:	Train & Utility Truck Crash on Railroad Right-of-way (not at a Grade Crossing)
Vehicle #1:	2005 Ford F450 Pick-up truck towing a 2000 Tandem Axle Utility Trailer
Vehicle #2:	Metrolink Commuter Train #102
Operator #2:	Metropolitan Transportation Authority
Date:	February 24, 2015
Time:	Approximately 5:44 a.m. PST[1]
NTSB #:	**HWY15MH006**

HUMAN PERFORMANCE FACTORS GROUP

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[1] For clarity, all reported times in this report are in Pacific Standard Time, regardless of what time zone the event occurred.

CRASH SUMMARY

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

DETAILS OF THE HUMAN PERFORMANCE FACTORS INVESTIGATION

The focus of this report is a crash which involved a 2005 Ford F450 in combination with a 2000 Wells Cargo tandem axle utility trailer and a Metrolink commuter train.

The Human Performance factual investigation focused on the behavioral, medical, operational, and environmental factors associated with the driver of the 2005 Ford, hereafter referred to as the accident driver; these factors are listed below.

1.1. Behavioral Factors

1.1.1. Activities Prior to the Accident

Because the accident driver declined to be interviewed, information in this section and subsections were obtained from an interview with the driver's employer, employee time and attendance records[2], and data downloaded from the driver's cell phone device[3]. A summary of the driver's activities for the 72 hour period leading up to the crash are listed in **Table 1**.

Table 1 2005 Ford Driver Activities Prior to the Crash

Saturday, February 21, 2015		
Time	Event	Source
3:57 a.m.	Driver goes on duty	Carrier Records
1:09 p.m.	Driver goes off duty	Carrier Records
Sunday, February 22, 2015		
Time	Event	Source
	Driver off duty	Carrier Records
Monday, February 23, 2015		
Time	Event	Source
5:51 a.m.	Driver goes on duty	Carrier Records
1:00 p.m.	Driver begins trip to Oxnard, CA	Employer Interview
4:27 p.m.	Driver reports vehicle breakdown to supervisor	Cell Phone Data
9:00 p.m.	Driver resumes trip to Oxnard, CA	Employer Interview

[2] See Human Performance Factual Report Attachment 1: 2005 Ford Driver's Time and Attendance Records.
[3] See Human Performance Factual Report Attachment 2: 2005 Ford Driver's Cell Phone Voice Call Data.

Tuesday, February 24, 2015		
Time	Event	Source
1:31 a.m.	Driver calls son to report minor crash	Cell Phone Data
2:07 a.m.	Driver attempts calls supervisor to report crash	Cell Phone Data
2:19 a.m.	Driver calls 911to report crash	Cell Phone Data
5:44 a.m.	**Accident occurs**	Police 911 Records[4]

1.1.2. Sleep Factors

Because the driver declined to be interviewed, no information regarding his general sleep habits or health was obtained. However, other relevant sources of information were used to obtain his recent sleep history. The accident driver's timecard shows that he reported to work on February 23, the day prior to the crash, at 5:51 a.m. According to driver's employer, he worked a six hour shift at the carrier base before departing at 1:00 p.m. for a work assignment in Oxnard, California. Although the trip was expected to take approximately 6 hours, the driver encountered unexpected delays along the way which caused the duration of the trip to last approximately 15 hours. At the time the crash occurred, the driver had gone without substantive sleep for approximately 24 hours.

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 54 year old male. Information regarding the driver's health was obtained through records from his healthcare insurance provider and his most recent Commercial Motor Vehicle Driver Fitness Determination Exam. The driver's primary care physician was identified however; the physician is located in Mexico and not subject to the authority of the federal subpoena process. When asked, the physician declined to voluntarily provide health information about the driver, citing privacy concerns for the driver.

1.2.2. Healthcare Insurance Records

Because information from the driver's primary care physician was unavailable, records from the driver's employee provided health insurance provider were obtained. The data in the records provide detailed information regarding payment claims from healthcare providers for medical services that were rendered to the driver. The records cover a one year period prior to the crash and provide insight into the overall health of the accident driver.

[4] For more information see the Survival Factors Group Chairman Report in the docket for this investigation.

By identifying Current Procedural Terminology (CPT)[6] codes and Diagnosis Codes[7] NTSB staff was able to determine the types of medical treatment the 2005 driver received during the covered time period of the records. The records indicate the driver sought medical treatment on several occasions however; the majority of which were not relevant to this investigation. In July of 2014 the driver began undergoing treatment for hypertension. The hypertension condition was annotated in his most recent Commercial Motor Vehicle Driver Fitness Determination examination. (*See sections below)* The records show that after the initial diagnosis, the driver received recurring treatment for hypertension.

1.2.3. 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.[8] 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;[9]
- 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.

1.2.3.1. Most Recent CDL Medical Exam

The accident driver's most recent medical Examination for Commercial Driver Fitness Determination was on August 28, 2014. The exam was conducted by a Physician Assistant at a community health center in Yuma, Arizona.[10] In the self-reporting health history section on the report, the driver indicated "YES" to high blood pressure. He indicated "NO" to all other items in the health history section. For any "YES" response, the driver was asked to "indicate onset date, diagnosis, treating physician's name and address, and any current limitations. In that section, the words "Losartan 25 mg. HTN" are written. "HTN" is a common medical acronym for hypertension. There was no further information provided for this section.

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[6] CPT codes are a set of medical codes, established by the American Medical Association which describes medical, surgical and diagnostic services performed by healthcare providers.
[7] Diagnosis Codes is a classification system in healthcare used to identify diseases, disorders, and other reasons for patient encounters.
[8] 49 Code of Federal Regulations §391.41.
[9] For more information on who must be examined and the examination process, please see 49 CFR §391.43 and 49 CFR §391.45.
[10] See Human Performance Factual Report Attachment 3: Commercial Driver Medical Examination Report.

The driver's height was recorded as 69 inches and his weight was recorded as 190 pounds. This corresponds to a Body Mass Index (BMI) of 28.1%.[11] The driver's blood pressure was recorded as 128/75 and his pulse rate was 85 and regular. A urinalysis showed no protein, blood, or sugar. A physical exam noted no abnormalities in any of the driver's body systems.

1.2.3.2. Vision

In the exam report, the driver's Snellen uncorrected visual acuity was recorded as 20/50 in both eyes, uncorrected and 20/20 in both eyes corrected.[12] His horizontal field of vision was 90° in both eyes. It was noted that the driver correctly distinguished between red, green, and amber colors. He was noted as not having monocular vision.

1.2.3.3. Hearing

In the exam report, the physician reported that the driver was able to hear a forced whispered voice at a distance of six feet with the left and right ear. An audiometer was not used to test his hearing.

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

In the section of the exam report which asks the driver to report "all medications (including over-the-counter) used regularly or recently", the driver indicated he was taking Losartan[13] in a 25 milligram dosage. There were no other medications listed in this section.

1.2.4. 2012 CDL Medical Exam

On September 7, 2012 the accident driver went to a community health center in Yuma, Arizona to obtain medical certification to operate a commercial motor vehicle. However, during the exam the driver was found to have an elevated blood pressure and was subsequently denied medical certification. Records from the health clinic indicate he did not return to re-attempt certification until his most recent exam in August 2014.

1.2.5. Alcohol and Drug Consumption

Officers from the Oxnard Police Department contacted the accident driver shortly after the crash occurred. In observing the driver's behavior, the officers observed no signs of the driver being under the influence of drugs or alcohol.

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

[12] 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.

[13] Losartan is an Angiotensin Receptor Blocker used to treat patients with high blood pressure, see http://www.fda.gov/Drugs/DrugSafety/InformationbyDrugClass/ucm218897.htm.

1.2.6. Post-Crash Toxicology

Following the crash, the accident driver was taken into custody of the Oxnard Police Department. Because officers did not develop probable cause to believe the driver was under the influence of alcohol or drugs; post-crash toxicology testing was not performed.

1.2.7. Psychological Factors

In an interview with NTSB investigators, the accident driver's son indicated that his father had not undergone any recent stressors or significant life events. Additionally, the circumstances of the crash do not suggest that the crash was the result of an intentional act.

1.3. Operational Factors

1.3.1. Licensing

At the time of the crash, the accident driver held a valid class A Arizona Commercial Driver's License (CDL) with a corrective lenses restriction. [14] The license was issued on September 26, 2013 and expires in April 2018.

1.3.1.1. License History

According to the Commercial Driver's License Information System (CDLIS) the accident driver has two traffic violations in his driver license history; driving under the influence of alcohol and refusing to submit to an alcohol test. [15] Both offenses occurred on September 5, 1997. There was no record of convictions or accidents in the National Driver Registry.[16]

1.3.2. Training/Experience

Because the motor carrier had an incomplete driver qualification (DQ) file, there was no information discovered regarding the driver's basic commercial motor vehicle (CMV) training, employment history, or CMV driving experience. For further information regarding the driver's DQ file, see the *Motor Carrier Factors Group Chairman's Factual Report*.

The motor carrier maintained an employee training file for the accident driver. However, the training in the file related to the Occupational Safety and Health Administration (OSHA) safe workplace standards.[17] There was no documentation of training specific to the operation of CMV's.

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[14] An Arizona class "A" driver's license allows the holder to operate a commercial vehicle with a Gross Vehicle Weight Rating (GVWR) of 26,001 or more in combination with a trailer with a GVWR of 10,001 or more or a combination vehicle with a combined GVWR of more than 26,001 pounds or more.

[15] The Commercial Driver's License Information System (CDLIS) is a nationwide database that compiles commercial driver's license data from all 50 states and the District of Columbia enabling states to ensure each commercial driver has one driver's license and a complete driver record.

[16] The National Driver Register (NDR) is a database containing information on U.S. drivers who have had their licenses revoked or suspended, or have been convicted of serious traffic violations.

[17] See 29 CFR 1910 for Occupational Safety and Health Standards.

In an interview with the accident driver's son, he stated his father has driven a truck tractor in a previous job. According to the motor carrier, the accident driver has occasionally driven truck tractors but, it is not his primary job responsibility. He drives an exemplar vehicle as the accident vehicle daily and is very familiar with its operating characteristics.

1.4. Task Factors

1.4.1. Crash Trip

At the time of the crash the 2005 Ford was traveling from Yuma, Arizona to Oxnard, California. The route of travel the driver selected had a distance of 350 miles and an estimated travel time of approximately 6 hours. However, due to a mechanical breakdown and a minor traffic crash the actual travel took longer. The crash occurred 15 hours and 44 minutes after the driver began the trip. The driver used a Global Positioning Satellite application on his cell phone to navigate his way on the trip. The driver's route of travel was determined by identifying GPS Waypoint[18] data locations extracted from the accident driver's cell phone. **Table 2** summarizes the time date and locations of the GPS waypoints.[19]

Table 2 GPS Waypoint Data Summary

GPS Position	Date/Time	Distance from Trip Origin	Distance Remaining To Crash Site	Time elapsed from Estimated Trip origin	Time until crash occurs
Jacumba, CA[20]	February 23, 2015 4:53 p.m.	112 miles	245 miles	2 hrs. 53 min.	9 hrs. 54 min.
San Diego County, CA[21]	February 23, 2015 11:59 p.m.	234 miles	155 miles	9 hrs. 59 min	5 hrs. 44 min.
Commerce, CA[22]	February 24, 2014 3:55 a.m.	281 miles	66 miles	13 hrs. 55 min.	1 hr. 47 min.
Oxnard, CA[23]	February 24, 2015 6:40 a.m.	356 miles	1.6 miles	15 hrs. 44 min.	-

The route of travel was estimated utilizing GPS waypoint data and information from the driver's employer. The employer states the driver departed the carrier base in Somerton, Arizona at 1:00 p.m. The driver utilized a cell phone to navigate to his intended destination in Oxnard, California.

The first waypoint indicated in the cell phone device is along Interstate 8 (I-8) in Jacumba, California at 4:53 p.m. on February 23, 2015; about 3 hours after the driver departed the carrier base. The driver's supervisor states the accident driver called him and reported a mechanical breakdown when he reached Jacumba, California. A second truck from the carrier was sent to replace the broken down vehicle. According to the driver's employer, once equipment was transferred to the replacement vehicle, the driver resumed the trip around 9:00p.m.

[18] GPS Waypoints are navigational coordinates, including longitude and latitude positions, indicating a reference point
[19] See Human Performance Factors Attachment 4: GPS Waypoint Location Data.
[20] GPS coordinate 32.637398, -16.182668/Interstate 8 near Carrizo George Road Jacumba, CA
[21] GPS coordinate 33.334284, -17.500023/Interstate 5 near Horno Canyon Road San Diego County, CA
[22] GPS coordinate 33.997445, -18.145933/6150 Telegraph Road Commerce, CA
[23] GPS coordinate 34.173863, -19.141782/S. Rice Avenue near East Channel Island Blvd Oxnard, CA

The driver's employer indicates at approximately 2:00 am on February 24, 2015 the accident driver became involved in a minor traffic crash on Interstate 5 (I-5) in Los Angeles, California. Data downloaded from the driver's cell phone shows that he first called his supervisor to report the accident at 1:49 a.m. After several attempts to reach his supervisor, he was able to contact him at 2:07 a.m. The driver then called 911 at 2:19 a.m. A police report documenting the accident has not been located.

The next recorded waypoint taken from a download of the cell phone was along I-5 in Commerce, CA, an incorporated city Los Angeles County. The waypoint coordinates were recorded at 3:55 a.m. on February 24, 2015. There is no further information indicating driver's activity at this location. This is the final waypoint recorded before the crash occurred.

1.5. Workload/Distraction

Because the driver of the 2005 was not interviewed, a complete picture of influences affecting the driver's operation of the vehicle could not be determined. Available relevant information from other sources is explored in the subsections below.

1.5.1. Vehicle Familiarity

Although the accident vehicle was not the driver's normally assigned vehicle, it was similar to the make and model of his assigned truck. The driver operated vehicles similar in size and handling characteristics as the accident vehicle on a daily basis. His familiarity with the accident vehicle is not likely a relative cause of the crash.

1.5.2. Cell Phone Use

The accident driver used a cell phone to communicate during the accident trip. A forensic data extraction conducted on the accident driver's cell phone[24] indicated he used the phone frequently during the accident trip.[25] However, because of extended disruptions during the trip, it cannot be clearly established that the phone activity occurred while the vehicle was being driven. Some of the calls can be directly related to a vehicle breakdown or a minor vehicle crash which occurred during the trip. There was no voice call activity at or near the time of the crash. Additionally, the driver did not communicate by text message or email during the accident trip.

1.5.3. GPS Use

In an interview with the driver's wife by Oxnard Police investigators, she stated just prior to the accident trip, she gave the accident driver a smart phone to use to navigate. Data extracted from the driver's cell phone indicated that he utilized Google Maps[26] to navigate his way during

[24] A forensic data extraction was conducted by the Oxnard Police Department utilizing Cellebrite forensic technology which enabled data from the cell phoned to be decoded and analyzed for user activity.
[25] Extracted data from the 2005 Ford driver's cell phone identified 80 instances of voice activity during the accident trip; including dialed, received and missed calls.
[26] Google Maps is a GPS based mobile mapping application which provides the user with turn by turn directions and information.

the accident trip. *See section 1.4.1 Crash Trip for further information.* There is no information available on where the phone was placed as he navigated his way.

Audio files, which contained navigational directions created by Google Maps, were extracted from the driver's cell phone. There are two audio files which were recorded shortly before the crash. The first file was created at 5:32 a.m. and is spoken in Spanish. It stated in English "your destination is going to be on your left". It's likely this audio file was created when the driver turned onto the rail road right of way. The second file was created at 5:33 a.m. and when translated to English it states, "your destination is on the left" and was created as he traveled further down the railroad right of way.

1.6. Environmental Factors

The Federal Railroad Administration (FRA) GPS coordinates for the accident grade crossing were utilized to determine relevant environmental conditions at the accident location. The grade crossing location coordinates were:

A. Latitude: N 34.1971230
B. Longitude: W -119.1422770

1.6.1. Weather Information

Historical data for weather station KOXR (Oxnard Airport) located on 2889 W. Fifth Street Oxnard, California, approximately 3.7 miles from the crash site, was retrieved and examined. Observations for February 24, 2015, near the time of the accident are shown in **Table 3**.[27]

Table 3 Weather Data from Oxnard Airport (KOXR)

Time (EDT)	4:51 a.m.	5:51 a.m.
Temperature	45.0° F	46.0° F
Wind chill	41.8° F	44.8° F
Dew Point	37.9° F	37.9° F
Humidity	76%	73%
Pressure	30.21 in	30.23 in
Visibility	10 mi	10 mi
Wind Dir.	NE	NE
Wind Speed	5.8 mph	3.5 mph
Wind Gust Speed	N/A	N/A
Precipitation	N/A	N/A
Conditions	clear	clear

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

Astronomical Data for February 3, 1015

Using the GPS coordinates listed above, astronomical data for the accident location and date was downloaded from the United States Naval Observatory[28] (USNO). Downloaded astronomical data is summarized in the **Table 4**.

Table 4. Sun and Moon Date for Oxnard, Ca for February 24, 2015

Event	Time
ACCIDENT	**5:44 a.m.**
Begin civil twilight[29]	6:06 a.m.
Sunrise	6:32 a.m.
Sun Transit	12:10 p.m.
Sunset	5:49 p.m.
End civil twilight	6:14 p.m.

E. DOCKET MATERIAL

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

LIST OF ATTACHMENTS

Human Performance Attachment 1 - 2005 Ford Driver's Time and Attendance Records

Human Performance Attachment 2 - 2005 Ford Driver's Cell Phone Voice Call Data

Human Performance Attachment 3 - Commercial Driver Medical Examination Report

Human Performance Attachment 4 - GPS Waypoint Location Data

END OF REPORT

Kenneth J. Bragg
Human Performance Investigator

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

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