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

HUMAN PERFORMANCE FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

A. CRASH SUMMARY

For information and summary of the crash, refer to the *Crash Information & Summary Report* in the docket for this investigation.

B. HUMAN PERFORMANCE FACTORS GROUP

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D. DETAILS OF THE HUMAN PERFORMANCE FACTORS INVESTIGATION

This crash occurred when the driver of a 2013 Freightliner truck tractor in combination with a 2017 Utility semitrailer (truck driver) failed to stop for a traffic queue that had formed because of two previous crashes. The Human Performance factual investigation focused on the behavioral, medical, operational, and environmental factors associated with the truck driver. These factors are discussed in the sections below.

1. Behavioral Factors

1.1. Background

The truck driver was a 55-year-old male who began driving commercially in 1984; he first obtained a Commercial Driver's License (CDL) in 1992.[1] He lived in Illinois with his wife of three years. When the crash occurred, he was operating a truck-tractor in combination with a van style semitrailer through his employment with an over-the-road freight company.

[1] Drivers have been required to have a commercial driver's license (CDL) in order to drive certain commercial motor vehicles (CMVs) since April 1, 1992. Available at: https://www.fmcsa.dot.gov/registration/commercial-drivers-license/drivers .

1.2. Licensing

At the time of the crash the truck driver held a valid Illinois Class A-M Commercial Driver's License (CDL).[2] He held double/triple trailers, hazardous materials, and tank endorsements with a corrective lenses restriction.[3] Because of the extensive damage and post-crash fire, police investigators and the medical examiner were unable to determine if the truck driver was wearing corrective lenses when the crash occurred. The truck driver first obtained his CDL in February 1992. The current license was issued in October 2019 with an expiration date of November 2023.

1.2.1. License History

The truck driver's Illinois driving record[4] and the Commercial Driver's License Information System[5] (CDLIS) listed no traffic violations or convictions. However, pre-employment records from a previous carrier indicate that the truck driver had a traffic conviction for an improper U-turn on October 19, 2009 and speeding 15-25 mph over the speed limit on February 19, 2011. These violations did not appear in his current driving record due to record retention limits.[6]

A query of the Problem Driver Pointer System (PDPS) maintained by the National Driver Registry (NDR) found no indication that the truck driver's license has ever been suspended, cancelled or denied.[7]

1.3. Crash History

Information regarding the truck driver's involvement in past crashes was obtained from an insurance industry claims database and a comprehensive database of public records. The information indicated that the truck driver had been previously involved in four crashes. **Table 1** lists the details of each crash.

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[2] A Class A license allows the holder to operate any combination of motor vehicles with a gross combined weight rating (GCWR) of 26,001 pounds or more, in combination with a trailer in excess of 10,000 pounds in commerce. A Class M allows the holder to operate any motorcycle or motor-driven cycle.

[3] A doubles/triple trailer endorsement allows the holder to operate a combination vehicle towing two or three trailers simultaneously; A hazmat endorsement allows the holder to operate a vehicle transporting any hazardous material that requires placards, and; a tank endorsement allows the holder to operate a vehicle designed to carry any liquid or gaseous material within a tank(s) that is permanently or temporarily attached to the vehicle.

[4] Human Performance Factors Attachment – Truck Driver's License History.

[5] Human Performance Factors Attachment – Truck Driver CDLIS Report

[6] Illinois traffic violations remain on a driver's record from four to five years. Found at: https://www.cyberdriveillinois.com/departments/drivers/faq.html#:~:text=Moving%20violations%20such%20as%20speeding,from%20the%20date%20of%20conviction.

[7] National Driver Registry is a division in the National Center for Statistics and Analysis within the National Highway Traffic Safety Administration which maintains the Problem Driver Pointer System database. The database contains records of driver's whose privilege to drive has been suspended, cancelled, revoked or denied or who have been convicted or serious traffic-related offenses.

Table 1: Truck Driver's Crash History

Date	Location	Crash Severity	Vehicle Type
5/27/17	Sugar Grove, IL	Incapacitating Injury	Motorcycle
9/22/16	Hoffman Estates, IL	Property Damage Only	CMV
9/25/15	Illinois (city unk)	Property Damage Only	CMV
4/7/12	Lake County, IL	Property Damage Only	Passenger Car

1.3.1. 5-27-17 Crash

This single-vehicle crash occurred on State Route 31 in Sugar Grove, IL, while the truck driver was operating a personally owned motorcycle. While in a curve, the truck driver struck a curb, loss control and fell to the roadway. As a result of the crash, the truck driver was critically injured; the motorcycle was severely damaged. The crash report was not available.

1.3.2. 9-22-16 Crash

This crash occurred on I 90 in Hanover Township, IL.[8] The crash occurred when a truck tractor semi-trailer combination vehicle, operated by the truck driver, was side swiped by another truck tractor combination vehicle that merged when a lane ended. The crash resulted in minor damage to both vehicles. The truck driver was not found to be in fault in this crash.

1.3.3. 9-25-15 Crash

This crash occurred on I 90 at Division Ave in Chicago, IL, and involved a CMV operated by the truck driver, and a passenger car.[9] The crash occurred when both vehicles merged into the same lane which resulted in minor property damage only. Neither driver was cited as being at fault in the collision.

1.3.4. 4-7-12 Crash

This crash occurred on State Route 59 in Lake County, IL.[10] The crash occurred when a passenger car, operated by the truck driver, struck the rear of a SUV while it was stopped at a red signal. The truck driver stated to police that the crash happened because his foot slipped off the brake. The crash resulted in minor damage to both vehicles; no injuries were reported.

1.4. Experience

According to the truck driver's employment application with the accident carrier, dated October 24, 2019, he has had non-interrupted employment as a commercial driver for the previous ten years.[11] He self-reported on the application that from April 1999 until October 2019 he worked as an owner/operator of a commercial motor carrier. He further reported that he has driven

[8] Human Performance Factors Attachment – 9-22-16 Crash Report.
[9] Human Performance Factors Attachment – 9-25-15 Crash Report.
[10] Human Performance Factors Attachment – 4-7-12 Crash Report.
[11] Human Performance Factors Attachment – Truck Driver's K Express Employment Application.

approximately one million miles in truck tractors, one hundred thousand miles in straight trucks, and one hundred thousand miles in truck tractors with double trailers.

1.5. Crash Trip

The crash trip was a general freight delivery from the carrier's base in Bensenville, IL to a packaging manufacturer in Arden Hills, MN. The distance of the intended trip was about 394 miles. The crash occurred on I-39, about 149 miles from the beginning of the trip and about 245 miles from the destination. When the crash occurred, the truck driver had been on-duty for about 3 hours and had been driving for about two hours and thirty-three minutes. The crash trip was not a dedicated route for the driver however, he had driven this section of the interstate previously. Activities Prior to the Crash

Information about the truck driver's activities in the days leading up to the crash were obtained from his cell phone records[12], telematic recording data aboard the accident truck[13], and data from the truck driver's electronic logging device (ELD).[14] The truck driver's activities are listed below in **Table 2**.

Table 2: Truck driver's activities leading up to the crash

Monday, June 8, 2020		
Time	Event	Source
1:48 a.m.	Driver on duty Elk Grove Village, IL	Electronic Logging Device
1:56 a.m.	On duty, driving	Electronic Logging Device
3:14 a.m.	Driver makes first cell phone call of the day[15]	Cell Phone Records
4:29 p.m.	Off Duty Vickery, OH	Electronic Logging Device
5:55 p.m.	Last cell phone call of the day	Cell Phone Records
Tuesday, June 9, 2020		
Time	Event	Source
3:50 a.m.	Driver on duty Vickery, OH	Electronic Logging Device
5:28 a.m.	Driver made first cell phone call of the day	Cell Phone Records
2:17 p.m.	Driver off duty Elk Grove Village, IL	Electronic Logging Device
2:25 p.m.-4:21 p.m.	Continuous use of cell phone[16]	Cell Phone records
7:02 p.m.	Driver received the last cell phone call of the day	Cell Phone Records
Wednesday, June 10, 2020		
Time	Event	Source
2:33 a.m.	Driver goes on duty, Elk Grove Village, IL	Electronic Logging Device
3:55 a.m.	Driver made first cell phone call of the day	Cell Phone Records
4:04 p.m.	Driver goes off duty, Riley, IN	Electronic Logging Device
6:03 p.m.	Driver received last cell phone call of the day	Cell Phone Records

[12] Human Performance Factors Attachment – Truck Driver's Cell Phone Records.

[13] Human Performance Factors Attachment – Accident Truck Telematics Report.

[14] Human Performance Factors Attachment – Truck Driver's ELD Records.

[15] Cell phone use during the day was almost continuous. Time periods, of more than one hour, when there was no phone use were: 6:10 am – 7:29 a.m.; 8:39 a.m. – 9:49 a.m.; 1:34 pm – 3:42 p.m.

[16] During this one hour, fifty-six-minute time period the driver used the phone for voice communication 6 times for a total of 19.32 minutes.

Thursday, June 11, 2020		
Time	Event	Source
3:44 a.m.	Driver made first cell phone call of the day	Cell Phone Records
4:02 a.m.	Driver on duty, Riley, IN	Electronic Logging Device
4:08 p.m.	Driver off duty, Elk Grove Village, IL	Electronic Logging Device
5:26 p.m.-7:53 p.m.	Continuous use of cell phone[17]	Cell Phone Records
Friday, June 12, 2020		
Time	Event	Source
3:48 a.m.	Driver on duty	Electronic Logging Device
4:09 a.m.	Driver begins driving, Elk Grove Village, IL	Electronic Logging Device
4:50 a.m.	Driver receives first cell phone call of the day	Cell Phone Records
5:27 am.-5:51 a.m.	Driver made cell phone call (23.57 min duration)	Cell Phone Records
6:45 a.m.	**Crash Occurs in Arlington, WI**	Police Records

1.6. Sleep Habits

This section describes the truck driver's typical habits and routines in obtaining sleep. His sleep opportunities were influenced by his work schedule and family life. Because the driver did not survive the crash, information about his sleep opportunities and quality in the days leading up to the crash was obtained from an interview with his wife and employment records

According to the truck driver's wife, on the first day of a typical work week, he would wake up about 2 or 3 a.m. He then would drive his personal vehicle to the carrier, which was about an hour away. Once he arrived at the carrier, he would pick up his work truck and begin his route. At the end of his first day of the work week, he would spend a night in the truck before returning home the next afternoon. He typically returned home between 4 and 6 p.m. the second day. He would then repeat the cycle before having days off work.

The truck driver's wife stated that he generally slept well – both at home and in his truck. He had not been diagnosed with any sleep disorders and he did not take medication to fall asleep. He typically got up in the middle of the night to use the bathroom but otherwise slept through the night. She also stated that he snored loudly when he slept.[18]

A review of the truck driver's ELD and cell phone records were used to determine his typical work hours leading up to the crash. The records show that the truck driver typically began working in early morning hours; 2-4 a.m. and stopped working in the afternoon; 2-5 p.m. On June 7, 2019, 5 days before the crash, the driver reported being off duty the entire day.

The truck driver's pattern of cell phone use was also examined to determine if there were significant periods of phone usage during times available for obtaining rest. The cell phone records

[17] During this two-hour, 27-minute time period the driver used the phone for voice communication 3 times for a total of 48.82 minutes.

[18] See the *Medical Factors Report* for additional information related to the truck driver's sleep health.

indicate that the truck driver primarily used his cell phone during the day. In the five days leading up to the crash, the driver had no cell phone usage past 8:00 pm.

The information shows that the truck driver's workday began in the early morning and that he had nighttime hours available for sleep. In the four days leading up to the crash, the driver had an average of about 7.7 hours per night available for sleep night. Although it could not be determined how much sleep the truck driver actually obtained, **Table 3** lists the number of hours he had available for sleep each night. The entries in the table assume that the driver had about an hour drive from home to the carrier base and that he got up about thirty minutes before beginning his day on June 10th and June 12th.

Table 3: Truck drivers sleep opportunity.

From		To		
Date	**Time**	**Date**	**Time**	**Elapsed Time**
June 8, 2020	6:00 p.m.	June 9, 2020	3:30 a.m.	9 hours 30 minutes
June 9, 2020	7:00 p.m.	June 10, 2020	1:00 a.m.	6 hours
June 10, 2020	6:00 ~ p.m.	June 11, 2020	3:15 a.m.	9 hours
June 11, 2020	8:00 p.m.	June 12, 2020	2:15 a.m.	6 hours 15 minutes

1.7. Cell Phone Use

Cell phone records were examined to determine if the driver was using a cell phone when the crash occurred. Available records included voice call data; there was no information indicating text messaging or other cell phone usage by the driver. The records show that the truck driver initiated a phone call at 5:27 a.m.; the call terminated at 5:51 a.m. (24 minutes). The crash occurred about 54 minutes after the phone call ended.

1.8. Health Factors

According to the truck driver's wife, he had been treated for diabetes and hypertension. He went to his physician regularly, about every three months, to monitor the status of these conditions.[19] She stated that prior to the crash, he was not feeling well and he had scheduled an appointment with his doctor the day after the crash. She further stated that he was feeling tired and his appetite was unusual. He had said to her that he was not feeling well but did not state specifically what was wrong. He generally did well taking his daily medication. According to his wife, the truck driver had not experienced any recent stressors.

For more information regarding the truck driver's general health, toxicology testing, medications, Commercial Driver Fitness Determination, and sleep health, see the *Medical Factors Factual Report* for this investigation.

[19] Human Performance Factors Attachment – Truck Driver's Wife Interview Transcript

1.9. Response to Hazard

Information about the roadway and traffic conditions were obtained from a forward-facing video on a truck traveling behind the accident truck. The video shows that the truck driver had a clear, unobstructed view ahead. There was a white passenger car stopped immediately in front of the crash truck, and a large commercial vehicle stopped in the immediate left lane. There were other vehicles stopped in front of those vehicles. In adjacent left lane, there was a black passenger car that began to slow down for the stopped traffic. Because of the distance the recording vehicle was from the crash truck and the quality of the video, it is not possible to determine if the brake lights of the vehicles ahead were on.

2. Environmental Factors

2.1. Global Positioning System (GPS) Location

The NTSB utilized GPS coordinates for this crash as determined by the Wisconsin State Patrol. Relevant environmental conditions for this location are described in the sections below.

Latitude: N 43.317017016
Longitude: W -89.441856806

2.2. Weather Information

Historical data for weather station KMSN, Dane County Regional Airport, Madison, Wisconsin, approximately 11 miles from the crash site, was retrieved and examined. Observations for June 12, 2020, near the time of the accident, are shown in Table 4.[20] A review of the past 24-hour weather conditions indicated a period of light rain showers was reported in the area between 1600 and 1700 CST on June 11, 2020, with gusting winds to 30 mph, with only a trace of precipitation being reported. No rain was reported at the time of the accident with relatively clear skies.

The astronomical conditions for Arlington, WI, indicated that the beginning of civil twilight occurred at 0441 CST, with sunrise at 0516 CST. At 0641 CST the Sun was approximately 12° above the horizon at an azimuth of 70° above the horizon.

Table 4. Data from Weather Station KMSN, Madison, WI

Time (EST)	5:53 a.m.	6:53 a.m.
Temperature	61° F	65° F
Dew Point	55° F	52° F
Humidity	81%	63%
Pressure	29.32 in	29.34 in
Wind Dir.	S	Calm
Wind Speed	6 mph	0 mph
Wind Gust Speed	N/A	N/A
Precipitation	N/A	N/A
Conditions	Fair	Fair

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

E. DOCKET MATERIAL

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

LIST OF ATTACHMENTS

Human Performance Factors Attachment – Truck Driver's License History

Human Performance Factors Attachment – Truck Driver CDLIS Report

Human Performance Factors Attachment – 9-22-16 Crash Report

Human Performance Factors Attachment – 9-25-15 Crash Report

Human Performance Factors Attachment – 4-7-12 Crash Report

Human Performance Factors Attachment – Truck Driver's K Express Employment Application

Human Performance Factors Attachment – Truck Driver's Cell Phone Records

Human Performance Factors Attachment – Accident Truck Telematics Report

Human Performance Factors Attachment – Truck Driver's ELD Records

Human Performance Factors Attachment – Truck Driver's Wife Interview Transcript

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END OF REPORT

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