

**National Transportation Safety Board**  
Office of Railroad, Pipeline and Hazardous Materials Investigations  
Human Performance and Survival Factors Division  
Washington, D.C. 20594

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## **HUMAN PERFORMANCE GROUP CHAIRMAN'S FACTUAL REPORT**

### **A. ACCIDENT**

**Location:** Chicago, Illinois  
**Carrier:** Chicago Transit Authority (CTA)  
**Trains:** Transit Train  
**Date:** March 24, 2014  
**Time:** 2:49 a.m. CDT  
**Number:** DCA-14-FR-007

### **B. HUMAN PERFORMANCE GROUP**

#### **Group Chairman**

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#### **Group Members**

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David Kowalski  
Chief Transit Operations Officer  
Transit Operations  
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## C. SUMMARY OF THE ACCIDENT

On March 24, 2014, about 2:49 a.m., CDT, a Chicago Transit Authority (CTA) train run 141 collided with the bumping post at the end of the center pocket track at CTA's O'Hare Station. The lead car rode over the bumping post and went up an escalator at the end of the track used by the public to enter the airport. There were an estimated 50 people onboard the train at the time of the accident. Thirty three injured passengers and the injured rapid transit operator (RTO) were transported to the hospital. Since the accident an additional six passengers claimed being injured. The estimated damage to the equipment was \$6 million. The track and structure damages were estimated at \$3.1 million. The accident was in a covered area of the station and the outside temperature was 19° F.

## D. DETAILS OF THE INVESTIGATION

### 1. Behavioral Factors

#### a. Sleep/Wake/Work History

The RTO had been assigned to the extra board and had experience working the morning, afternoon and midnight shifts. She stated that working the midnight shifts afforded her more opportunity to do (practice) troubleshooting.

She told investigators that on the night of the accident she did not feel tired at the start of her shift. During the accident trip she started to feel tired after she had departed Rosemont Station (the station immediately before O'Hare Station) and headed to O'Hare. (The travel time between those stations is about 4-5 minutes). She told investigators that it was sometimes challenging staying awake during the midnight shift, and indicated that the most challenging times for her to remain alert was between 2:00 a.m. and 3:00 a.m. She stated,

“You know, my body has to adapt to staying up all throughout the night, you know, adjust to the schedule. But it's mainly just doing those trips back and forth, and once you get to the last one, you know, you tend to get tired on the last trip.”

The RTO's work and rest schedule during the 3 days leading up to the accident is presented in Table 1.

**Table 1. The RTO's 72-hour sleep and wake history.**

Day	CTA Job	Duty Times	Activities at Home	Sleep
Thursday 3/20	Flagging	7:30 a.m.-3:30 p.m.	Arrived home between 5:00 p.m.-5:30 p.m. Ate, relaxed	Slept Thursday from about 11:00 p.m.-Friday 10:00 a.m.
Friday 3/21			Ate breakfast, relaxed at home. Departed for work at 6:30 p.m. and arrived at 7:30 p.m.	
Friday 3/21	RTO	On duty Friday 8:40 p.m. to Saturday 6:17 a.m.		
Saturday 3/22			Arrived home about 9:00 a.m. Showered, played team sport until noon. Departed for work about 4:00 p.m.	Napped "maybe 50 minutes" sometime between 12:00 p.m. and 4:00 p.m.
Saturday 3/22	RTO	Arrived at CTA 5:22 p.m. (missing her scheduled on-duty time of 4:55 p.m. because "I overslept"). Rescheduled on duty 6:40 p.m. to 2:25 a.m. Sunday		
Sunday 3/23			Arrived home about 4:00 a.m. <sup>1</sup> Remained at home. Departed for work at 6:30 p.m.	Told investigators she slept soon after arriving home until about 2:00 p.m.-3:00 p.m. ( <i>see paragraph and table immediately below</i> )
Sunday 3/23	RTO	On duty 8:40 p.m. (scheduled to work until 5:46 a.m. Monday)		
Monday 3/24	RTO	2:49 a.m. Accident at O'Hare Station		

<sup>1</sup> The RTO did not indicate her arrival time home that morning. Investigators estimated 4:00 a.m. based on her reported normal commute time.

Examination of the RTO’s cell phone and SMS records for activity on Sunday March 23, 2014, however, indicates that she had not been asleep for the duration she reported to investigators. Table 2 lists select activity from the RTO’s cell phone for that day.

**Table 2. Select cellular phone activity on Sunday March 23, 2014.**

<b>Time</b>	<b>Activity</b>
10:45 a.m.	Outgoing call
10:46 a.m.	Text message sent
11:04 a.m.	Text message sent
11:05 a.m. -12:07 p.m.	Numerous text messages sent and received
12:07 p.m. - 2:30 p.m.	No phone or text message activity
2:31 p.m.	“Data Usage” (e.g., accessing the internet/applications)

*Additional Information.*

- The RTO told investigators that she needed between 6-8 hours of sleep to feel rested.
- During the week before the accident the RTO had worked 55.7 hours, which included one double shift and one day off.
- She had worked 10 of the previous 11 days before the accident. (The RTO’s 30-day work history is included as an Attachment).
- She told investigators that her commute time to work is between 1½ and 2 hours. However, during her commute she would often arrive to work early, sometimes as much as 30 minutes prior to the start of her shift. (Investigators noted that her residence is about 30 miles away).

**2. Task Factors**

a. Accident trip sequence

The RTO went on duty Sunday, March 23, 2014 at 8:40 p.m. She departed on her first trip at 8:50 p.m. She was scheduled to operate her train from O’Hare Station to Logan Square Station, making five round trips. Her workload on each of her trips before the accident was normal and there were no intra-cab or external distractions. At 2:23 a.m. she departed Logan Square Station. She turned her cab heater off at Harlem Station to improve her comfort level and because she was feeling drowsy. She told investigators, “I believe it took a toll on my body as far as making me tired.”<sup>2</sup> Just outside the tunnel (prior to entering O’Hare Station), the RTO had nodded off while operating the train. She told investigators,

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<sup>2</sup> The RTO told investigators that the heater was working properly.

“I was operating normal up until I reached O’Hare Terminal. I was tired. I didn’t get any sleep the day before and I might – I have – I became sleepy and I nodded off into the terminal at O’Hare.”<sup>3</sup>

Her train continued to travel into the station. The tracks had been lined so that the train would travel and berth in the center pocket tracks.<sup>4</sup> (Two other trains were already occupying the track 1 and track 2, the two outside tracks). The train traveled through the station with no braking or manipulations of the master controller. Seconds before it made impact with the bumping post the train hit the fixed trip, which had awakened her, but not in time for her to apply the brakes or press the emergency stop “mushroom” (that initiates emergency braking) before impact.

b. Cellular Phone Use

The RTO’s cellular phone records show no activity (i.e., incoming or outgoing calls, SMS, or data usage) at the time of the accident.<sup>5</sup>

**3. Medical Factors**

a. Health

The RTO, 25, had undergone a pre-employment physical in 2013. In her CTA medical records, the RTO reported generally good health and no medications. She told investigators that her overall health was good, and her vision and hearing were normal. She indicated that she had had a cold about a week before the accident, but had not been taking any prescription or non-prescription medications. She stated that she did not have any chronic medical conditions. She stated that she snores when she sleeps, but had not been diagnosed with any sleep disorder.

b. Post-accident toxicological tests

In accordance with Federal Regulations, following the accident the RTO was required to be tested for drugs and alcohol. The RTO provided a breath test (for alcohol) and provided a urine specimen (to test for the presence of drugs). This test was conducted at a CTA facility near CTA’s O’Hare Station. The results of these tests were negative for illicit drugs and alcohol.

**4. Operational Factors**

a. Training for RTOs

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<sup>3</sup> The RTO told investigators that it was on her last of her 5 roundtrips that she first became tired.

<sup>4</sup> A CTA tower operator was stationed at the near end of the platform. However, she did not have visual contact with the rapid transit operator (RTO) when she entered the station. The tower operator did not have radio contact with the RTO, nor was it routine practice that there would be any communication between the tower and the RTOs.

<sup>5</sup> Current CTA policy (see CTA General Bulletin #G54-09) dictates that cell phones are not allowed in the cab of the train.

The CTA Rail Instructor II, who has been an instructor for 27 years and was involved in training students in becoming Rapid Transit Operators, provided investigators with an overview of their RTO training program.

The program includes 17 days of formal training that consists of the following: Seven days classroom training, which includes details about their duties and responsibilities, radio communication, blocks and interlocking, signals and trouble shooting. Eight days of training takes place in the field, including railcar familiarization, towers, coupling and troubleshooting. The last 2 days is training specific to 5000 series rail cars. Students must pass written tests. A score of 100% is required to pass the signals test.

After this portion of the training has been completed, RTO trainees spend 10 days operating trains in passenger service while under supervision.

The Rail Instructor indicated that the most challenging aspects for students is stopping at the proper berthing mark while making station stops, and troubleshooting.

#### b. RTO's Operating Experience

The RTO involved in the O'Hare accident began working at the CTA on April 1, 2013 as a flagman. In December 2013, she began formal training to become an RTO and became a qualified operator on January 24, 2014. She told investigators that her training experience was very positive. She stated that the most challenging aspect of her training was learning the signal system and troubleshooting. She had primarily worked the Blue Line and less often the Pink Line.

#### c. Employee Discipline

Feb 1, 2014. According to her Employee Hours Lost/Corrective Action Form, the RTO received a written warning because she "Fail[ed] to make station stop." The form did not include any additional details. The RTO told NTSB investigators (on March 25<sup>th</sup>, 2014) that the incident happened on her last trip and "I dozed off..." and slid out of the station. "I was a new operator, I panicked because I slid out. And I just proceeded on normal to the next station."

*Additional Incident.* On March 22, 2014, the RTO arrived late and missed the start of her 4:55 p.m. shift. She was re-assigned to work the 6:40 p.m. shift. During post-accident interviews, the RTO told investigators that she had overslept and had departed her home too late. This incident did not appear in her personnel records at the time of the accident.<sup>6</sup>

#### d. CTA's practice of scheduling work

The Administrative Manager interviewed by investigators was hired by the CTA in 2001 as a Project Specialist II. In 2007 she was promoted to administration manager. During these

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<sup>6</sup> According to CTA, on March 24, 2014, the RTO did not show up to a discipline hearing, and was discharged from the CTA by mail.

two positions she has worked on several different lines on the CTA. Her current position's duties and responsibilities included overseeing payroll, and scheduling for the trainmen, flagmen, customer service representatives, and assistants. She was also responsible for administration reports that are provided to upper management. She oversees operations in the office of the clerks, including all scheduling, including approving time off, sick days and injuries. At the time of the accident, Administrative Managers were not required to take fatigue awareness training.<sup>7</sup>

At CTA, every 6 to 9 months there is a "pick" process where employees are assigned new work schedules. Employees either work regular schedules (about 80% of the employees) or are included in the extra board (about 20% of the employees). The selection is based on seniority. When an employee who has been assigned a regular work schedule is off (for instance, due to illness or training) their work is filled in with the extra board employees.

CTA has an a.m. extra board and a p.m. extra board. Employees on the a.m. extra board will work assignments starting up to about 4:00 a.m. Those assigned to the p.m. extra board would usually be assigned to work starting about noon. Assignments for extra board employees are completed by 4:30 p.m. each day. At that time, these employees are able to contact the clerk to receive their next assignments. (The upcoming assignments would not begin until after midnight that same day).

Per CTA's standard policy, work assignments for those working regular schedules are typically 8-9 hours long, five days per week; and employees are given at least 8 hours off between assignments. Per agreement with Local 308, employees are not permitted to be assigned to work beyond 13 hours. However, employees can volunteer to work overtime.<sup>8</sup> This could result in them working consecutive shifts, for instance, two back-to-back 8 or 9 hour shifts. (In these instances, they would be required to have 8 hours off before the start of their next assignment). Those volunteering for overtime after working a single shift can have fewer than 8 hours off between assignments.

CTA poses no limit on employees working double shifts in a given week.<sup>9</sup> The Administrative Manager told investigators, "The only time we would consider not giving someone [overtime] is if we feel that it's not safe for them to continue to double every day." That decision is made by the manager at that work location. (A clerk, whose duties include observing the employees, may alert a manager. The manager can then examine the payroll and see the tally of hours the employee has worked)<sup>10</sup>.

On March 19, 2014, after finishing her assignment early in the morning, the RTO had requested to work overtime by working another shift later that day. The CTA clerk was aware that the RTO had just worked 7 consecutive days, and suggested that the RTO not work another shift that day (which was her scheduled day off).

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<sup>7</sup> CTA indicated that since the accident, all managers, including Administrative Managers, are required to, and have, taken fatigue awareness training.

<sup>8</sup> CTA estimates that at most 10% of the employees request overtime. Overtime pay is time and a half.

<sup>9</sup> A CTA employee can work overtime by either by working on their scheduled day off, or by working a double shift. The latter is more common.

<sup>10</sup> If CTA decides not to give the employee overtime work, the employee can file a grievance with their Union.

Compiled by: /s/  
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