



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

HUMAN PERFORMANCE GROUP CHAIRMAN'S FACTUAL REPORT

A. ACCIDENT

Carrier: Sacramento Rail Transit District (SRTD)
Equipment: Two light rail vehicles
Location: Sacramento, California
Date: August 22, 2019
Time: About 9:38 p.m.
NTSB accident #: RRD19FR011

B. HUMAN PERFORMANCE GROUP

Group Chairperson

Stephen M. Jenner, Ph.D.
Human Performance Investigator
National Transportation Safety Board

Group Members

Philip Herbert
Special Agent
Federal Transit Administration

Sheila Lawton
Business Representative
International Brotherhood of Electrical Workers, Local 1245

Ralph Niz
Business Agent
Amalgamated Transit Union

Michal Rose
Operations
California Public Utilities

Rob Hoslett
Chief, Environmental Health and System Safety
Sacramento Regional Transit District

C. SUMMARY OF THE ACCIDENT

For a summary of the accident, please refer to the IIC's Report.

D. DETAILS OF THE INVESTIGATION

1. **Behavioral Factors**

a. Sleep/Wake/Work

The transportation supervisor regularly worked on Thursdays through Sundays as a “C Dispatch/Controller.” Prior to the day of the accident, he last worked on Sunday, August 18 from 2:30 p.m. to 12:30 a.m. He was off duty Monday, Tuesday and Wednesday (August 19-21). On his days off, he typically kept the same wake/sleep schedule as he did when he was working. On Tuesday, he spent the day at home. He went to bed Wednesday morning between 4:00 a.m. – 5:00 a.m. and woke up between 11:00 a.m. and noon. He told investigators that his sleep quality is good. During the day he performed some home maintenance. He went to bed Thursday morning between 4:00 a.m. – 5:00 a.m. and awoke between 11:00 a.m. and noon. Soon thereafter he departed his house at 12:45 p.m. and had a one-hour commute to work. He went on duty at 2:00 p.m.

2. **Medical Factors**

The transportation supervisor had a medical history of high blood pressure and cholesterol controlled with use of prescription medications. He took Prilosec¹, Singulair² and Zyrtec³, and stated that none affected his performance. He took Ibuprofen occasionally for headaches. He passed the Ishihara test (for color blindness) on January 17, 2018, and wore corrective lenses corrected to 20/20 vision. He had not been diagnosed with any type of sleep disorder, and had maintained a regular sleep schedule based on his late work schedule.

3. **Task Factors**

¹ Prilosec is used to treat symptoms of gastroesophageal reflux disease (GERD) and other conditions caused by excess stomach acid.

² Singulair is used to prevent or treat symptoms of asthma or allergies.

³ Zyrtec is an antihistamine used to relieve allergy symptoms.

a. *Duties and responsibilities.*

Transportation supervisors are trained in two distinct duties: Dispatching operations and controllers.

Dispatcher duties include scheduling and assigning operators to trains, distributing radios, accessing the extra board for staffing, and completing various types of paperwork for management. They make notations for track warrants where work is being performed, and create operating bulletins for the next day. They assist in emergencies by contacting law enforcement and medical responders. Dispatchers can also assist the controllers with train operations if necessary.

The duties of a controller primarily consist of talking on the radio with train operators, including issuing bulletins and orders. They put out all the bulletins, such as slow orders when heat restrictions are in place. Controllers work with wayside operations, for instance, issuing a *confirm hold* to stop trains at a specific location while wayside personnel work along the track. Controllers are responsible for adding trains during peak hours, and making cuts after the peak hours have ended. They are also responsible for any abnormal or unusual moves that need to happen, especially during service disruptions.

On the day of the accident, the Transportation Supervisor went on duty at 2:00 p.m. He had the “C Dispatch/Controller” assignment which was scheduled to end at 12:30 a.m. During the first part of his shift he performed only dispatching duties. At 7:30 p.m. and 8:30 p.m., the two other dispatchers/controllers on duty had completed their shifts. After 8:30 p.m., the transportation supervisor took over the radio (controller) duties. At that time, he was the only person in the dispatch center and consequently performed both dispatching and controller duties for both the Blue and Gold lines.

b. *Workload.*

During the evening (including the time of the accident), both the Blue and Gold lines had its normal five light rail trains operating in revenue service on each line, and a 30-minute gap between trains. During the day, there were 10 trains per line, with a 15-minute gap between trains.

The transportation supervisor described his nighttime workload on the day of the accident as a normal, busy day. He told investigators that performing both duties at night is “fine if

everything goes good. If it doesn't, you're in a whole lot of trouble." His workload increased due to some abnormal situations, which included the two times he spent communicating with the train 3 operator who was dealing with a disturbance with a passenger on a light rail vehicle. That issue purportedly occurred around the time of the accident.⁴

The senior transportation supervisor told investigators that the typical workload after 8:30 p.m. was not high and was manageable for a single person. He said that if workload became excessive, they can request assistance from a road supervisor who can assist with dispatching and controller duties. He further stated that other personnel could be used as resources to manage high workload. Dispatch workload decreased in the evening (i.e., many of the dispatching duties can be completed by 8:30 p.m.)

c. Consist Manager

The Consist Manager is a computer program displayed on a desktop computer screen that tracks the location of trains by GPS. This system was implemented in early 2019.

The senior transportation supervisor told investigators that the Consist Manager was always on full display during his shift. He indicated that it is close to real time, and he used it as a guide or a tool to aid him in identifying the location of the trains on the system. He relied on the Consist Manager for reverse moves to help him identify the location of other trains, particularly if they were running late. He also stated that he depends on radio communication with the train operators to verify the exact location of a particular train.

The accident transportation supervisor told investigators that on the day of the accident, another employee informed him that there were problems with the Consist Manager most of the afternoon. The accident transportation supervisor would normally use the Consist Manager only about 50% of the time, but when he was very busy, he would not access it on his computer monitor. He told investigators that he did "not have a lot of trust in it." He said he used it during the day, but rarely used it at night. At night, he said that he was busy with the radio, dispatching duties and paperwork, and did not have time to use the Consist Manager.

d. Authority for test train to enter mainline.

⁴ There was no entry in the Daily Control Log about the issue with the passenger.

On the night of the accident, the transportation supervisor received a telephone call from the test train operator (on the landline) at 9:24 p.m.⁵ The test train operator had called from the train that was located in the maintenance facility near the Marconi Station. They had discussed the test train operator's desire to enter the mainline and operate the test train from the Metro yard to Grand Avenue bridge and then immediately return. (This maneuver typically takes 10-15 minutes). According to the transportation supervisor, he told the test train operator to wait until outbound train 9 (a revenue train) passed, then contact the controller for authorization. The transportation supervisor was cognizant that train 9 was 15 minutes behind schedule, but did not know the exact location of that train.

The test train operator, however, told investigators that there was no discussion on the telephone about train 9, and that he would not have entered the mainline had he known about train 9.

Less than 15 minutes after the telephone call, the test train operator, per operating procedure, radioed the transportation supervisor and formally requested authorization to enter the main line. Per the dispatch radio recordings, the test train operator stated:

“Request permission to enter the mainline with LRV 310 on the outbound track to the Grand Avenue bridge, then reverse run back to the yard.”

The transportation supervisor granted him that authority. There was no discussion on the radio regarding the location of train 9. The transportation supervisor did not know that the test train had entered the track before train 9 had passed Marconi Station.

Per company procedures, the controller was required to issue a bulletin on the radio to other trains operating on the mainline notifying them that the test train was entering the mainline near Marconi Station. Each train operator was required to acknowledge the receipt of that bulletin via radio communication back to the controller, who makes a notation of every train that responded. The transportation supervisor was also required to have a direct radio communication with the operator of the train closest to the Marconi Station (i.e., train 9) to verify its location. However, the transportation supervisor did not issue a bulletin and did not have a direct radio communication with train 9. He told investigators that about that time, “ten things were going on

⁵ There is no recording of this conversation.

at once.” He added, “I got busy with train 3⁶ and – I just got busy and he was almost halfway done with it by the time it settled down a little bit.” He told investigators that the decision to issue a bulletin depended on how busy he was.

The transportation supervisor also did not access the Consist Manager to determine the location of train 9. He acknowledged that had this situation occurred during the day, he would likely have referenced the Consist Manager, which would have been pulled up on his computer screen.

c. Transportation supervisor’s post-accident report

Following the accident, the dispatcher completed the Regional Transit Light Rail Occurrence Report (8/23/19). He described the occurrence as follows:

“V-12 called on the phone and asked to do some UTDC testing and wanted to go to Grand Avenue bridge and back to Metro. I told him that he could do that but after the outbound train (I do not remember the train number). A few minute later, V-12 called on the radio asked to enter the main line. I gave him authorization.

During the time between the phone call from V-12 and the accident, I was extremely busy with Train 3 having issues with a passenger and running both lines, finishing paperwork, and phones. When I spoke with V-12 I had thought he would be returning to Metro on the I/B [inbound] track.”

4. Operational Factors

a. Transportation supervisor training and experience

The transportation supervisor was hired by SRTD in January 2018. Prior to that he had worked five years as a train dispatcher with Canadian Pacific Railroad.

After completing his 6-month initial training and working independently an additional three months, he successfully completed his probation.⁷ He was then assigned relief duty, from November 2018 to January 2019, for other transportation supervisors who were on vacation. During this period, dispatching duties increased and his time as a controller decreased. After January 2019, his controller duties increased, and he spent about eight hours per shift working

⁶ Train 3 was the revenue train that had the issue with an unruly passenger.

⁷ All new employees are on a probation period for 270 days from the date of the employment.

the radio until mid-April. From mid-June until the day of the accident, the time he spent as a controller was about five hours per shift.

As part of the training process, supervisors were given a checklist of different tasks they were required to perform when performing both dispatch and controller duties. Trainers would initialize each item when the tasks had been performed. At the end of their 9 months of training, they were given a final performance review. During this nine-month period, a supervisor could monitor their performance on the radio. Afterwards, they get a year of certification training that involved their knowledge of the rule book. They were also put through a review of all the switches on the main line and troubleshooting of the LRVs.

b. *Performance Evaluation*

The transportation superintendent reviewed daily paperwork developed by those performing dispatching duties to assess the accuracy and identify mistakes. Common mistakes included calculating missed time for trains when there is a lost trip, and calculating time for operators who had taken time off.

On the transportation supervisor's first annual performance evaluation (January 2019), he was rated "Meets" on each of the four job elements on a scale that includes "*Below*," *Meets*," and "*Exceeds*." The job elements included *technical expertise*, *administrative*, *other job skills*, and *other work habits*. Included in the comment section is "Radio control duties still needs to improve." In the section indicating *Areas needing improvement/opportunities for development*, it stated: "At times misses radio calls. Be more aware of the activity on the line. Slow decision making at times. At times no clear and concise directions." In addition, under *Overall Performance*, it stated: "[He] has the ability of being a great asset to the department. Work on the tools mentioned above."

The transportation superintendent was aware of other people's concerns about the dispatcher's performance controlling trains. Some supervisors had identified occasions when the transportation supervisor had gotten confused or lost the location of a train. Consequently, the transportation superintendent had discussed with the transportation supervisor the need to improve his strategy in order to maintain awareness of the location of the trains, and improving his awareness of communications he had with train operators.

c. Performance Improvement Plan (PIP)

The transportation superintendent developed a Performance Improvement Plan to address the accident transportation supervisor's performance deficiencies. On April 17, 2019, the SRTD Director of Transportation sent a letter to the transportation supervisor concerning his job performance. The Director of Transportation, citing the transportation supervisor's performance appraisal on January 8, 2019, noted that his work performance,

“met the acceptable standards expected of a Transportation Supervisor at that time, although comments were included that your Radio Control duties still needed to improve. It clarified that you were missing radio calls, needed to be more aware of the activity on the main line, and at times had exhibited slow decision making and provided no clear and concise directions. As of today, I have not observed any significant improvement in your work performance and work product. Sacramento Regional Transit values you as an employee and desires to see you fulfill your potential.

Therefore, you are being placed on a 90-day improvement period, where your work will be closely monitored and evaluated. The purpose and intent of this Performance Improvement Plan is to define areas of serious concern and/or deficiencies within your work performance, recap Sacramento Regional Transit's expectations, and provide you with the opportunity to demonstrate improvement and commitment.”

The letter further stated that,

“Radio Control Duties including missed radio calls, not being aware of the activity on the main line, slow reaction time to make a decision, and the failure to provide clear and concise directions.”

Eleven specific examples (on eight separate days) of “Areas of concern and/or deficiency” were cited between January 7, 2019 and April 5, 2019.

The letter detailed “Improvement Goals” that laid out expectations for the transportation supervisor to use proper radio procedures, have knowledge of train activity and conditions on the mainline; make expedient decisions, and provide clear and concise directions to all light rail personnel.

The letter also indicated that the transportation supervisor would have a review with the transportation superintendent every two weeks (beginning in late April) to discuss his progress.

During the week of April 15th to 19th, the transportation supervisor was closely supervised by a senior transportation supervisor, who provided additional retraining, which focused on improving his controller (radio) skills. The senior transportation supervisor also briefed his supervisor and the Director of Light Rail operations about their progress. He told investigators that initially there were areas that the transportation supervisor needed to improve upon, including delays in his response to calls from train operators. The senior transportation supervisor saw improvement in the transportation supervisor's performance after one week, and ultimately felt confident in his ability to operate as a controller. The accident transportation supervisor said that he found the PIP program beneficial during the period he was working with senior transportation supervisor, who had observed him and offered suggestions on how to improve his performance.

Following one-week of close supervision, the accident transportation supervisor continued to work as a controller, and was being informally monitored by the senior transportation supervisor who was working the same shift on an adjacent desk. The senior transportation supervisor believed that he was doing well.

After mid-June (about 2 months after the start of the PIP), the accident transportation supervisor had changed shifts, and the two transportation supervisors no longer worked together. During his new shift (which he worked until the day of the accident) the accident transportation supervisor was not being monitored by another transportation supervisor working that same shift.

The senior transportation supervisor was aware of concerns from other supervisors regarding the performance of the accident transportation supervisor. These concerns were expressed after he had changed shifts in mid-June. The issues were related to his performance as a dispatcher in general, including errors in scheduling and keeping track of operators. There were no concerns expressed by other supervisors regarding his performance as a controller during the evening/night shift.

Compiled by: /s/

Date: January 10, 2020

Stephen M. Jenner, Ph.D.
Human Performance Investigator