

NATIONAL TRANSPORTATION SAFETY BOARD

OFFICE OF RAILROAD, PIPELINE &

HAZARDOUS MATERIALS INVESTIGATIONS

Washington, D.C. 20594

RRD22LR002



OPERATIONS FACTUAL REPORT

(27 Pages)



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**NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF RAILROAD, PIPELINE & HAZ-MAT INVESTIGATIONS
WASHINGTON, D.C. 20594**

OPERATIONS FACTUAL REPORT

A. ACCIDENT

Type: Watco Dock & Rail, L.L.C. Employee Fatality
Date and Time: October 29, 2021, at 4:02 a.m. CDT
Location: Houston, Texas
Carrier: Watco Dock & Rail (In-Plant Switching)
Job: Watco-202

B. OPERATIONS INVESTIGATIVE GROUP

Zachary Zagata,
IIC/Operations Group Chairman
NTSB Office of Railroad, Pipeline and
Hazardous Materials

Curtis Dougherty,
FRA IIC/OP Safety Inspector,
Federal Railroad Administration

Damien Cantrell
AVP Operations,
Watco

C. ACCIDENT SUMMARY

On October 29, 2021, at approximately 4:02 a.m. local time, a Watco Dock & Rail (WDRL) set of two locomotives and 25 rail cars, collided with a truck tractor in combination with a semi-trailer (combination vehicle) as the train and combination vehicle both entered a private crossing outside of the gated perimeter of the Greensport Industrial Park in Houston, Texas, on property leased to Musket Corporation. The train was traveling



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at a speed of 7.68 mph while shoving rail cars through the crossing on a lead track outside of the fenced perimeter of the Industrial Park. A WDRL employee was protecting the movement of the train from the end rail car and died as a result of the collision.

D. DETAILS OF THE INVESTIGATION

Description of the Greensport Industrial Park

The incident occurred outside of the gated perimeter of the Greensport Industrial Park, located off the Houston Ship Channel. At this location WDRL entities handle ocean vessels, barges, trains, and trucks carrying a diverse variety of freight including dimensional shipments such as wind turbine components, vessels, and machinery; plastics; liquids such as chemicals, petrochemicals, and petroleum products or crude oil, refined products, and ethanol; building materials; bulk solids; and steel in all forms. The industrial park contains over 30 miles of trackage and ability to store over 1,600 railcars, with WDRL providing switching services.



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Figure 1: Overhead of Greensport Industrial Park.

Description of Watco Companies, L.L.C. (Watco)

Watco Companies is a transportation company based in Pittsburg, Kansas. Watco is composed of four divisions: transportation, mechanical, terminal and port services, and compliance. Watco is the owner of Watco Transportation Services, L.L.C. (WTS), which operates 41 short line railroads in the U.S. and Australia. It is one of the largest short line railroad companies in the United States. As of December 2018, it operated on 5,500 miles (8,900 km) of leased and owned track. Watco and its subsidiaries also provide contract switching services for 30 customers. That is the service that Watco originally offered before it branched out into other areas. Watco Dock & Rail, L.L.C. is an indirect subsidiary of Watco Companies, L.L.C.



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Description of Gemini Motor Transport

Gemini Motor Transport, L.P. is a nationwide for hire fuel and specialty products motor carrier. In 2001, Gemini became the primary carrier for Love's Travel Stops & Country Stores. Gemini has more than 1,050 trucks and employs approximately 1,200 professional drivers. Gemini is headquartered in Oklahoma City, Oklahoma, and employs drivers across the United States. Gemini drivers combine for more than 100 million miles annually across the United States. Musket is a raw division of Gemini and is non-union.

The Accident

On October 29, 2021, the crew for WDRL Job-202 reported for duty at 6:00 p.m. local time, at the Greensport Industrial Park in Houston, Texas. The crew consisted of a locomotive engineer and two conductors. Upon going on-duty, the engineer and one conductor (Conductor #1) met at the office and the second conductor (Conductor #2) came up later. After completing a job briefing, the crew worked in the west yard until around midnight, and then took their lunch. This was the first time the crew had worked together, and the engineer told investigators that during their lunch they were just getting to know each other.

After lunch the crew was tasked with shoving 25 rail cars approximately 30 or 40 car lengths from the lead over to switching Track No. 905. Before making the move, the



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crew discussed what needed to be done to complete the task. Conductor #2 gave Conductor #1 a ride in a UTV to the rail car he needed to ride. Conductor #2 told investigators that he told Conductor #1, “Once you get to the other side, make that joint and I’ll make the cut.” After dropping of Conductor #1 at the rail car, Conductor #2 started making his way over in the UTV to be in position to make the cut. He took the UTV all the way around Industrial Park and passed by the crossing about seven minutes before the accident. Conductor #2 stated he knew the gate was open because they pulled some cars through there before lunch, and it was open when they went on duty at 6:00 p.m.

As the crew began shoving, the engineer was on the headend operating the locomotive, and Conductor #1 was on the end of the consist protecting the movement, communicating how many cars they needed to go. In a post-accident, interview the engineer stated that, “he is the eyes and ears on what’s going on back there,” and the communication was via radio. During the interviews, when asked how he felt Conductor #1 was doing, he told investigators he felt Conductor #1 was doing very well and everything seemed normal. Security footage indicated that, while protecting the movement, Conductor #1 was positioned with three points of contact (two feet on the platform and one hand on the bar). Conductor #1 was holding his lantern in the elbow crook of his other arm, with that hand on the radio microphone button on the opposite side of his chest to allow communication with the locomotive engineer on the opposite side of the train. Conductor



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#1 held onto the bar with his left hand, which would have his body partially turned away from the side of the grade crossing from which Federal Road traffic approaches.

The train was traveling at an approximate speed of 8 mph with Conductor #1 protecting the movement as the shoving movement approached the grade crossing. Security camera footage obtained from a local business (Summit Steel) located on the other side of Federal Road indicated that, at 4:02:23 a.m., the train's movement was approaching a private crossing outside of the gated perimeter of the Greensport Industrial Park, on property leased to Musket Corporation, when the southbound combination vehicle made a left-hand turn from Federal Road toward the private grade crossing without stopping. At 4:02:27, the train and combination vehicle simultaneously attempted to proceed through the private grade crossing without stopping, resulting in the train impacting the truck. The event recorder data from the lead locomotive indicated that at 4:02:28, the engineer initiated an emergency brake application, moved the throttle from notch 4 to idle, and centered the reverser. At 4:02:37, the truck and train came to rest (figure 1). The engineer told NTSB investigators that Conductor #1 had just previously given him a seven car countdown and then he said, "That will do". The engineer stated that he could tell by the sound in Conductor #1's voice that something was wrong, so he put the train into emergency. The engineer then called Conductor #1 on the radio and said, "are you okay," and got no response. The engineer told investigators that shortly after, one of the managers who was monitoring the radio, said, "are you okay," and got no response. The manager



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then called Conductor #2 and told him to go check. The engineer remained on the locomotive until he was notified of what happened and, at that point, secured the train and went inside the yard office. At 4:17:53, EMS arrived on scene, followed by the Harris County Sherriff's Department at 4:18:57, and the Galena Park Fire Department at 4:21:07.



Figure 1. Final resting position of combination vehicle and the train.



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Event Recorder Data

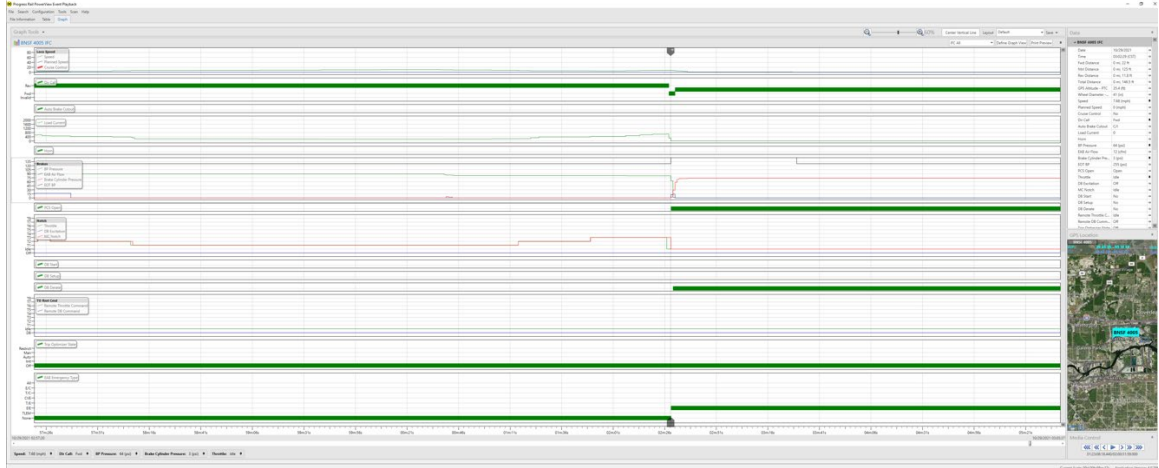


Figure 2: Snapshot of event recorder data

On October 31, 2021, the investigative group conducted a review of the event recorder data from the lead locomotive. The group determined that the train handling method utilized was consistent with normal train handling methods utilized during switching operations and not believed to be causal or a contributing factor in this accident. Note: The event recorder data was viewed by the investigative team while on-scene, and it was determined that all pertinent information was obtained. Therefore, no additional review was warranted.

Operating Documents



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The crew is governed by the General Code of Operating Rules (GCOR), Seventh Edition, effective April 1, 2020, and System Special Instructions. The operating rules and supplements provided by WDRL are as follows:

- General Code of Operating Rules, Eighth Edition, Effective April 1, 2020
- Transportation Safety Rules
- System Special Instructions, dated April 1, 2020
- General Track Bulletins
- General Notices and Orders

Applicable Rules

GCOR Rule 6.5 Shoving Movements

Equipment must not be shoved until the engineer and the employee protecting the movement have completed a job briefing concerning how protection will be provided. Employee must be in position, provide visual protection of the equipment being shoved and must not engage in unrelated tasks while providing protection.

Equipment must not be shoved until it is visually determined that:

- Portion of track to be used is clear of equipment or conflicting movements.



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- The track will remain clear to the location where movement will be stopped.
- Switches and derails are properly lined.

Employees may be relieved from providing visual protection when:

- Local instructions specify tracks involved and how shoving movement will be protected, such as shove light or monitored cameras.
- A track has been pulled and an equivalent amount or less of cars or equipment will be immediately shoved back into that track and that track has remained clear to the location where the movement will be stopped.
- Immediately before shoving, a movement is made on the adjacent track providing the employee the ability to visually determine the track to be shoved is clear and route is properly lined.
- Authority on main track or controlled siding allows for movement in direction of shove, provided route is properly lined, road crossings will not be fouled and movement at restricted speed is not required.

or

- Making back up movements in accordance with Rule 6.6 (Back Up Movements).



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Shoving movements over road crossings must be made in accordance with Rule 6.32.1 (Providing Warning Over Road Crossings).

Speeds when Shoving

When cars are shoved on a main track or controlled siding in the direction authorized, movement must not exceed:

- 20 MPH for freight trains.
- 30 MPH for passenger trains.
- Maximum timetable speed for snow service unless the employee in charge authorizes a higher speed.

Transportation Safety Rule T-17 Riding In or On Moving Equipment

a. Team members must not be on equipment that is being coupled. All couplings must be made only when the team member is standing on the ground.

b. Do not ride:

- On moving equipment when the track cannot be clearly seen due to obstruction, debris, snow/ice or any other condition.



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- On the end ladder or crossover platform of any car except to ride the trailing end of the rear car provided the team member can ride outside the gauge of the rail.

- On the side ladder of the trailing end of a car, except the trailing end of the rear car in the movement or train.

EXCEPTIONS:

- o Team members may ride the end platform of cars equipped with a safety rail positioned between the platform and the end of the equipment, such as a caboose or shoving platform.

- o Team member may ride a full width crossover platform of a tank car provided the team member rides at the end of the platform (outside the gauge of the rail) with feet pointed toward the center of the platform.

- On the brake platform, except to operate the hand brake during gravity switch move

- On any part of the coupler apparatus, center sill, end sill, framework or inside a car

- Between a load of lumber, pipe, or other shiftable load and the end of the car. When a flat carload of this type is involved, do not ride between the end of the adjacent car and the load

- On the side of the flat car unless the car is equipped with hand holds high enough to allow for a firm handhold and erect body position

- Or walk between trailers or containers loaded on flat cars



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When riding equipment:

- Face the direction of movement

- Maintain three-point contact with the equipment at all times

- Protect against slack action

- Do not step or jump from one car to another

- Do not hold on to the end post, or sit or stand near the end door of a gondola equipped with drop ends

- Never step on the sliding center sill or cushion underframe device of any car. Keep off couplers and their components

- When duties permit, remain seated while riding in locomotives and cabooses

- Team members must not ride the side of rail cars equipped with a single vertical handhold until they have ensured that:
 - a) Speed is not greater than 10 MPH.
 - b) Three-point contact is maintained.
 - c) A job briefing has been held and the engineer is aware that a team member is riding such car.



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The engineer must control slack accordingly.

Note: Switching movements that will handle only single vertical handhold equipment may conduct this briefing at the beginning and end of such movements.

- Team members must not ride on the deck of a flat car except:
 - o For the purpose of protecting a shoving move
 - o When another car type is not available
 - o When conditions make riding the side of other available cars unsafe

Team members who must ride on the deck of a flat car must ensure that:

- a) Speed is not greater than 10 MPH.
- b) A job briefing has been held and the engineer is aware that a team member is riding a flat car. The engineer must control slack accordingly. Only ride on the deck of an empty flat car.
- c) Kneel or sit near the center of the car or the empty space.
- d) Kneel or sit before the equipment moves and until the equipment stops and the slack is adjusted.



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GCOR Rule 6.32.1 Providing Warning Over Road Crossings

When cars are shoved, kicked or a gravity switch move is made over road crossings at grade, an employee must be on the ground at the crossing to provide warning until crossing is occupied. Make any movement over the crossing only on the employee’s signal.

Warning is not required when crossing is equipped with:

- Gates that are in the fully lowered position.

or

- Flashing lights or passive warning devices (cross-bucks, stop signs, etc.) when it is clearly seen that no traffic is stopped at the crossing or is approaching the crossing. Leading end of shoving movements must not exceed 15 MPH over crossings.

Watco Post-accident Rule Change

On November 4, 2021, in an effort to protect Watco team members across the network, Watco issued the following system general order to all Watco rail operations throughout the United States:



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Watco

System General Order No. 02-21

Thursday, November 4th, 2021

▲ Effective: Immediately

Subject: Change to General Code of Operating Rules Effective April 1, 2020.

Please Change the following currently reading:

6.32.1 Providing Warning Over Road Crossings

When cars are shoved, kicked or a gravity switch move is made over road crossings at grade, an employee must be on the ground at the crossing to provide warning until crossing is occupied. Make any movement over the crossing only on the employee's signal. Warning is not required when crossing is equipped with:

- Gates that are in the fully lowered position.

or

- Flashing lights or passive warning devices (cross-bucks, stop signs, etc.) when it is clearly seen that no traffic is stopped at the crossing or is approaching the crossing. Leading end of shoving movements must not exceed 15 MPH over crossings.

To Read:

6.32.1 Providing Warning Over Road Crossings

When cars are shoved, kicked or a gravity switch move is made over road crossings at grade, an employee must be on the ground at the crossing to provide warning until crossing is occupied. Make any movement over the crossing only on the employee's signal. Warning is not required when crossing is equipped with:

- Gates that are in the fully lowered position.

Bradley Walker
Vice President Transportation Safety and Training

Watco General Order No. 02-21 modified GCOR 6.32.1 to be more restrictive and prohibit shove movements over crossings without stopping to provide warning, if not equipped with gates that are in the fully lowered position.



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Grade Crossing Accident Data

Accident data from the FRA safety data website shows that from November 1, 2020, through November 30, 2021, 44 grade crossing accidents involved a motor vehicle operator striking a train making a shoving movement.

The Switching Operations Fatality Analysis (SOFA) Working Group is an established, voluntary, non-regulatory, workplace-safety partnership. It was formed to look for commonalities among the fatalities that occur during switching operations and to develop findings and recommendations that will aid in preventing railroad employee deaths. The group includes representatives from the Federal Railroad Administration (FRA), the Association of American Railroads (AAR), Brotherhood of Locomotive Engineers & Trainmen (BLET), the Sheet Metal Air Rail Transportation Union (SMART), and the American Short Line and Regional Railroad Association (ASLRRA).

In the 2011 SOFA report, it was found that nine employees died in collisions with motor vehicles while riding railroad equipment during a shove movement over a grade crossing. Furthermore, 26 industrial hazard cases (23%) involved motor vehicles. This percentage is more than ten times the percentage for other, non-Industrial Track Hazard cases (2%).

The SWG made the following safety advisory statement in 2010 regarding riding railroad equipment through a grade crossing during a shove movement:



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Employees engaged in switching operations must not ride railroad equipment through a grade crossing during a shove movement.

The Sofa Working Group noted 116 of the 124 fatalities occurred when equipment was moving; 53% involved shoving moves. SOFA also found awareness an issue among highway vehicle users striking trains at public crossings; and truck drivers striking trains at industrial crossings.

External Oversight

In June of 2020, as part of an agency restructuring, FRA transitioned eight regional leadership teams into nine Safety Management Teams to serve as the Office of Railroad Safety's main liaison with the senior leadership of the Nation's railroads. Each of the nine safety management teams is assigned to Class I railroads or a group of railroads and provides safety oversight of the respective railroad system(s). The nine safety management teams are:

SMT-1: Amtrak, commuter, and excursion railroads in the eastern section of the Nation

SMT-2: Short Line East



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SMT-3: Norfolk Southern

SMT-4: CP/CN/CCD

SMT-5: BNSF

SMT-6: UP/KCS

SMT-7: Commuter and excursion railroads in the western section of the Nation

SMT-8: Short line railroads operating in the western section of the Nation

SMT-9: CSX

The Safety Management Teams represent FRA with the railroads, and they communicate and coordinate with FRA's Staff Directors, Accident Analysis Branch, Audit Management Program, and other Safety Management Teams. To carry out its mission, FRA staff includes about 400 Federal safety inspectors and specialists, as well as approximately 200 state inspectors who are spread throughout the US. Safety inspectors focus primarily on five safety disciplines when conducting inspections for compliance and enforcement; those disciplines are:

- Hazardous Materials
- Motive Power and Equipment



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- Operating Practices
- Signal and Train Control
- Track

Operational Testing/Internal Oversight

On November 25, 1974, the Federal Railroad Administration (FRA) provided notice of intent to move forward with the proposed rulemaking for Part 217-Railroad Operating Rules. Within Part 217, FRA codified internal oversight for railroad operations by establishing minimum requirements for railroads to conduct periodic tests and inspections to determine the extent of compliance with operating rules and timetable special instructions. Title 49 Code of Federal Regulations (CFR) Section 217.9 requires that every railroad have a written program of operational tests and inspections in effect. Employees are tested on various aspects of their job to evaluate their ability to perform their jobs correctly and their knowledge of company rules and federal regulations. This testing not only evaluates the worker's skills and overall ability to perform a task safely and correctly, it also reinforces compliance with rules.

A railroad's operational testing program on file with FRA must, at a minimum:



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1. Provide for operational testing and inspection under the various operating conditions on the railroad, at various times, and at a variety of locations.
2. Address with particular emphasis those operating rules that cause or are likely to cause the most accidents or incidents, such as those accidents or incidents identified in the quarterly reviews, 6-month reviews, and annual summaries.
3. Require a minimum number of tests and inspections per year covering the requirements of 49 CFR Part 218, Subpart F.
4. Describe each type of operational test and inspection required, including the means and procedures used to carry them out.
5. State the purpose of each type of operational test and inspection.
6. State, according to operating divisions where applicable, the frequency with which each type of operational test and inspection is to be conducted.
7. Identify by name, job title, and division or system, the railroad manager who is responsible for ensuring that the program of operational tests and inspections is properly implemented.
8. Require a record of the date, time, place, and result of each operational test and inspection that was performed in accordance with the railroad's program.
9. Require a record that specifies the railroad manager that performed the operational test or observation and each employee tested.



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10. Mandate a review of operational testing results and require adjustments to the program of operational tests accordingly.
11. Mandate a quarterly review when regulations require.
12. Mandate a 6-month review when regulations require.

As a result of the requirements, WDRL conducts tests and observations of its employees in accordance with federal regulations to determine their level of compliance with railroad operating rules. NTSB investigators reviewed WDRL's efficiency testing program and requested specific data regarding efficiency tests for the crew.

The WDRL program contains specific information for testing officers to be used when setting up and conducting tests. Federal regulations require that each test be described in the program including the means and methods used to conduct the tests. WDRL has established a program of operational testing which contains the required information by regulation which is needed to maintain consistency among its testing officers. A review of the efficiency testing results for the revealed the following:

From June 16, 2021, through October 20, 2021, Conductor #1 had been observed during operational testing by 4 supervisors on 17 occasions. The 4 supervisors recorded a total of 102 operational tests on 21 different rules. Conductor #1 had been found to be in



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compliance 100 times with the rules and procedures observed by the supervisors and was coached on 2 tests by supervisors; once for parking a UTV too close to the track, and once for not wearing gloves. Conductor #1's last efficiency test pertaining to shoving movements was performed on October 8, 2021, with a passing result. Conductor #1's last efficiency test pertaining to protection of a grade crossing was performed on August 29, 2021, with a passing result. Conductor #1's operational testing failure rate was 1.96%.

Note: The other crew members' performance and involvement during the accident did not warrant additional analysis of their operational testing records.

The Grade Crossing

The railroad crossing is outside of the gated perimeter of the Greensport Industrial Park on property leased to Musket Corp. It has pavement markings, flashing lights, a multiple tracks ("4 tracks") sign, no trespassing sign, and advance warning signage facing Federal Road. A sight distance/partial reenactment conducted at 4:00 a.m. revealed that the south side of the Musket driveway was well illuminated by a private flood light located south of the drive. During the sight distance, it was noted that the north side driveway did not have a flood light and it was found to be fairly dark, however, the employee and tank cars could still be seen. During the sight distance analysis, multiple Gemini combination vehicles entered and exited the facility. The photos in figure 3 were taken during the site distance test and provide an accurate depiction of the amount of lighting observed during



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the site distance conducted at 4:00 a.m. at the crossing with the train stopped inside the chain-linked fencing that borders the entry driveway.



Figure 3: Photos taken during the site distance test conducted at 4:00 a.m. local time. Note: The approach photographs and video do not represent a complete view from the perspective of the driver since the tank cars remains still.



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Watco Dock and Rail, L.L.C. Post-accident Crossing Changes



Figure 4: Looking in the direction of the movement of the combination vehicle, the two photos display the advance warning signage before and after the modification. The photo on the left was taken October 29, 2021, during the on-scene portion of the investigation. The photo on the right was taken on December 2, 2021, after completion of the modification to the advance warning signage.

WDRL modified Musket’s grade crossing’s advance warning signage with LED lights. The intent was to make the signage more visible while truck drivers enter the driveway that intersects with the crossing. WDRL indicated that it will be installing a flashing light stop sign when the private crossing is in use as well. WDRL is waiting on the sign to arrive from the vendor. WDRL indicated that it is identifying other crossings within the Greensport Industrial Park that could benefit from this added protection.



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