In-Station Training

TM 23-17 Commercial Vehicle Fire

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Purpose

Commercial vehicle fires can present significantly different challenges than passenger cars and small trucks. The size and type of truck, type of cargo, and access are important critical fireground factors when responding to this type of incident.

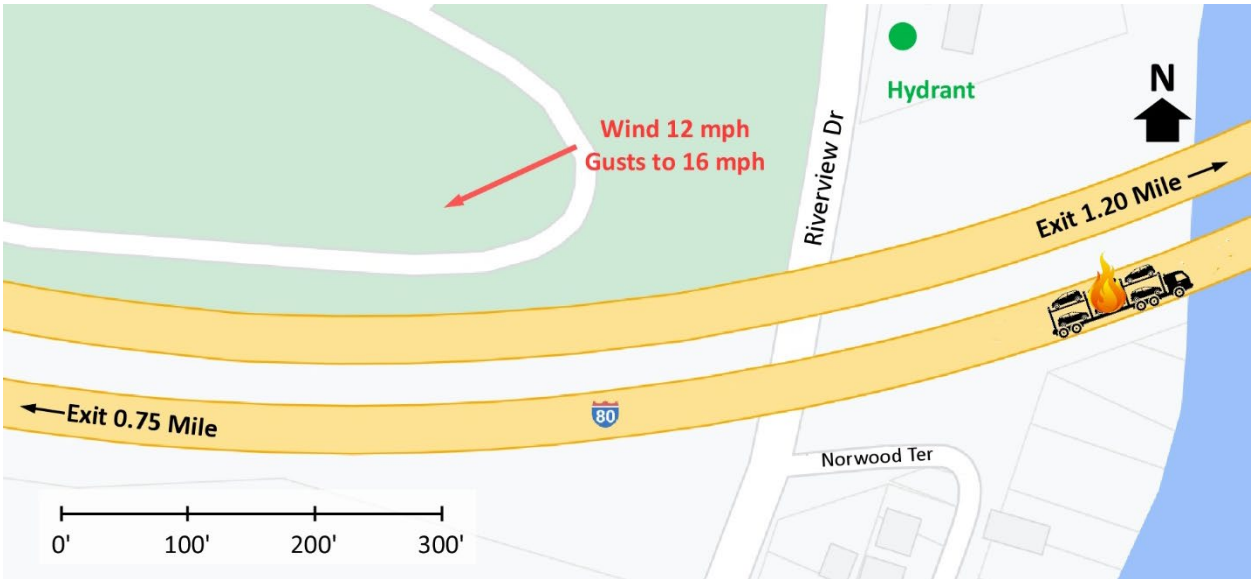
Learning Outcomes

Firefighters and officers perform an effective size-up; select an appropriate strategy, and implement tactics based on the strategic decision-making model.

Conducting the Drill

This incident involved a commercial vehicle fire on eastbound Interstate 80 in Woodland Park, New Jersey on April 5, 2023, at 10:30 (Tornadochaser66, 2023; Quinn, & Fagan, 2023). Review the map and photos (Figures 1-5) to gain an understanding of the area involved.

Figure 1. Map of the Incident Area



Note: Adapted from Google. (2023a). [map Interstate 80 East, Woodland Park, NJ]. Retrieved April 15, 2023, from https://bit.ly/419ptdN.

The closest hydrant is located on Riverview Drive (below the interstate highway) as illustrated in Figures 1 and 5. Other hydrants are located near the interstate exits to the east and west of the incident location.

Figure 2. Aerial View

Note: Adapted from Google. (2023b). [aerial view Interstate 80 East, Woodland Park, NJ]. https://bit.ly/3L2CIHG.

Figure 3. Eastbound I-80

Note: Adapted from Google. (2022a). [street view Interstate 80 East, Woodland Park, NJ]. https://bit.ly/41rYPwr.

Figure 4. Westbound I-80

Note: Adapted from Google. (2022b). [street view Interstate 80 East, Woodland Park, NJ]. https://bit.ly/3ohAoDK.

Figure 5. Riverview Drive (North of I-80)

Note: Adapted from Google. (2020). [street view 100 Riverview Drive, Totowa, NJ]. https://bit.ly/3A1nI6o.

You have been dispatched to Interstate 80, East of Exit 55A for a commercial vehicle fire. You are the company officer or AIC of the first arriving engine and have your company's typical staffing. Temperature is 51° F with wind at 12 mph and gusts to 16 mph from the east northeast (Weather Underground, 2023).

1. What critical factors would you consider when dispatched and during response and what conversations would you have with your crew while responding?

While responding you hear a second engine with typical staffing for your agency go enroute. The second engine will arrive approximately eight minutes after you. You are arriving from the west on Interstate 80. A short time after you go enroute, dispatch advises that the fire involves a tractor trailer car carrier with multiple cars involved. You hear a command officer go enroute and anticipate that they will arrive shortly after the second engine.

2. Based on this additional information, what critical factors would you consider when dispatched and during response and what conversations would you have with your crew while responding?

Watch the first 0:15 of the incident video (Tornadochaser66, 2023) and examine Figure 6 illustrating conditions on arrival.

Figure 6. Conditions on Arrival

Note: Adapted from Tornadochaser66. (2023). *Car carrier fire Route 80 East Exit 56 at the Totowa NJ-Woodland Park NJ border 4/5/2023* [video]. https://bit.ly/40aRobZ

3. State your initial radio report (IRR) exactly as you would transmit it to dispatch.

4. What specific actions would you take (as the company officer) immediately upon arrival and exiting the apparatus and what task orders you would give your crew?

Watch the incident video from 00:15 to 00:30 and examine Figure 7. You are unable to perform 360° reconnaissance due to the position of the vehicle in the breakdown lane, the guardrail, height of the highway above grade, and fire conditions. It does not appear that the involved and exposed vehicles are electric or hybrid.

Figure 7. Conditions Shortly After Arrival

Note: Adapted from Tornadochaser66. (2023). *Car carrier fire Route 80 East Exit 56 at the Totowa NJ-Woodland Park NJ border 4/5/2023* [video]. https://bit.ly/40aRobZ

5. Would you change the action you are taking or modify the assignments given to your crew? If so, what task orders would you provide?

6. State your update report exactly as you would transmit it to dispatch.

Shortly before arrival of the second engine, you hear a water tender go enroute with staffing typical for your agency.

7. State the tactical assignment you would give the next arriving engine exactly as you would transmit it.

8. Based on the anticipated effectiveness of your tactical operations, state your conditions, actions, and needs (CAN) report that you would provide to the first arriving command officer as part of command transfer to IC #2?

Watch the incident video (Tornadochaser66, 2023) from 02:30 to 03:30 before answering the next several questions.

9. Was the attack line stretched by the first arriving company effective in achieving fire control? What factors may have influenced the effectiveness of this attack line?

10. Moving traffic was a major hazard to operating companies at this incident. How could this risk have been reduced? What factors likely influenced the decision to maintain traffic flow during firefighting operations?

11. Would the water supply provided by two engines and a water tender have been adequate to achieve fire control and complete overhaul of the multiple involved vehicles? What options did you consider for reinforcing the initial water supply carried on responding apparatus?

12. How would the critical factors have differed if the car carrier had been transporting electric vehicles?

Additional Learning: Relay through a supply line is a standard tactical play in which water is pumped from one engine to another to overcome friction loss in the supply line. Relays require use of two or more engines depending on the length of the relay. In many respects, the most difficult part of establishing a relay is deploying the supply line and ending up with pumping apparatus in the correct location. At a minimum, one engine is at the fire (the attack engine) and another should be at the water source (supply engine). In a long, multi-engine relay, one or more relay engines are spaced to maximize flow capability. Consider how a relay could have been used to reinforce water supply at the incident presented in this 10-Minute Training and what hose evolutions (forward lay, reverse lay, split lay) could be used to efficiently deploy the necessary supply line.

Determining the flow capability of a relay is straightforward but requires the apparatus operator or water supply group supervisor to work backwards from friction loss to flow rate. Consider the following simple example:

- The relay is on level ground (no change in elevation)
- The supply engine maintains a discharge pressure of 120 psi.
- The attack engine maintains a residual pressure of at least 20 psi.
- The maximum friction loss in the supply line is 100 psi (120 psi-20 psi)
- Dividing 100 psi by the length of lay in hundred feet identifies the maximum friction loss/100’
- A friction loss table, field estimation, or calculation can be used to determine the flow rate that would result in that specific friction loss. This flow rate is the maximum flow capability of the relay.

Using the preceding criteria and working with 5” supply line and a length of lay of 1000’, the maximum friction loss in the supply line would be 10 psi/100’ which corresponds to a flow rate of slightly over 1000 gpm.

Consider the impact if the attack engine is 50’ higher in elevation than the supply engine (as would have been the case in this 10-Minute Training. If the standard relay pressure of 120 psi was maintained, how would the flow rate have been impacted. What could be done to maintain the same flow rate as could be achieved on level ground (no change in elevation)?

Discuss the relative advantages and disadvantages of relay versus water tender operations in the incident presented in this 10-Minute Training. Which would you choose and why?

References

Google. (2020). [street view 100 Riverview Drive, Totowa, NJ]. Retrieved April 15, 2023, from https://bit.ly/3A1nI6o.

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