

# Pilot/Escort Vehicle Operators

BEST PRACTICES GUIDELINES



U.S. Department of Transportation  
**Federal Highway Administration**

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# OVERVIEW

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This best practices guidelines document summarizes the material found in the 2016 *Pilot/Escort Vehicle Operators Training Manual*. The 2016 *Pilot/Escort Vehicle Operators Training Manual* is the result of extensive research, review, and analysis of existing pilot/escort vehicle operators (P/EVO) training materials, laws and rules relevant to P/EVOs, incident reports, and case studies and other information focused on the movement of oversize loads.

Contributors to this best practices document include the Federal Highway Administration (FHWA) Office of Freight Management and Operations, the Specialized Carriers and Rigging Association, and the Commercial Vehicle Safety Alliance, along with the Owner Operator Independent Drivers Association. Other contributors include P/EVOs, other professional associations, permitting officials, education professionals, transportation officials and engineers, insurance industry representatives, and enforcement officers. Additional guidance for the contents of this document was received from Western Association of State Highway and Transportation Officials, Southern Association of State Highway and Transportation Officials, Northeast Association of State Transportation Officials, Mid-America Association of State Transportation Officials, and many State department of transportation representatives, and others participating in the FHWA-sponsored Pilot/Escort Best Practices Working Group.

The *Pilot/Escort Vehicle Operators Training Manual*, its companion *Pilot/Escort Vehicle Operators Study Guide*, a P/EVO training presentation, and these *Pilot/Escort Vehicle Operators Best Practices Guidelines* are available to State agencies, training providers, and others involved in the training and certification of P/EVOs. Each of these documents can be used individually or in combination, and are available at no charge from FHWA's website. The format of these materials offers flexibility to meet the needs of the pilot/escort operators, from one- or two-car companies to more complex multi-state operations.

Learning how to be a P/EVO is similar to most other professions—individuals learn how to do the job primarily by doing it, but they must start with a basic understanding of how things work. The purpose of this document is to concisely present basic principles of pilot/escort operations. It is not possible to include detailed aspects of these operations, just as it is not possible to make highly specific laws and rules, not only because of the substantial differences among States with respect to pilot/escort operations, but also because of the seemingly infinite variety of oversize loads themselves. Add the elements of weather, the variety of roadways and traffic conditions, and the varied levels of experience and preparedness among the load movement team, and one can quickly understand the statement: Moving oversize loads is a prototypical proposition—that is, **every move is different.**





# I. PRE-TRIP PLANNING

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Learn as much as possible, as soon as possible. Then share it.

The responsibilities of the pilot/escort vehicle operator (P/EVO) begin long before becoming part of an oversize load movement team. The P/EVO must learn about and be in compliance with requirements in each State in which he or she will operate. For example, many States require P/EVOs be certified in order to escort oversize loads. States vary in the equipment P/EVOs must carry or display on their vehicles, and they also vary in terms of the insurance required. Finally, several States require flagging credentials, Transportation Worker Identification Credential (TWIC) cards,<sup>1</sup> or defensive driving courses to operate within their borders.

Safety begins with learning as much as possible about the load and the route, learning this as soon as possible, and sharing the information with all members of the load movement team. Sharing adequate and accurate information is a matter of safety—good decisions come from knowing the facts.

P/EVOs can initiate and maintain critical communication exchanges among the load movement team. It is vital to safe load movement that each team member understand the needs of and plans for the move, and is clear about his/her specific responsibilities. All drivers must be aware of contingency and emergency plans that are especially relevant for the day ahead.

Each team member must do everything possible to maintain a climate of cooperation and information sharing. It is important that each team member have the authority to stop operations and to raise questions and issues of concern at any time and about any aspect of the project. A well-informed movement team and an open climate of cooperation among team members must not be underestimated as instruments of safety.

## A. ASSIGNMENT CONFIRMATION

When receiving an assignment, P/EVOs should:

1. Obtain oversize load vehicle information including the vehicle configuration (axle configuration, steering limitations, etc.) and dimensions (height, width, length, weight). Important questions to ask include: Is the oversize load vehicle top heavy? Have low ground clearance? Have overhangs? Is it an articulated trailer? Are skid boards in place? Will load require use of a height pole?
2. Obtain a copy, in advance, of the permit and any related documents (route survey, for example). Information about the route and the dates and times of travel is of primary importance.
3. Estimate daily travel distance, interim stops, safe parking, and lodging for overnight trips.

<sup>1</sup> TWIC cards are needed to enter secure areas of maritime ports. P/EVOs are not required to have a TWIC card; they are useful only for those who deliver loads to ports.

4. Obtain information, including emergency and non-emergency contact information, for the carrier, the load driver, and other escorts, as well as general emergency numbers, railroad and utility company contact information, additional numbers for local officials when needed, permitting offices along the route, and others.
5. Prepare contingency plans, and ask for any written documents outlining the carrier's policies, including emergency procedures. Ensure each member of the load movement team is aware of the contingency plans and location of relevant documents. Contingency plans should address what to do if an escort vehicle breaks down or a driver has an emergency or becomes too ill to continue, for example.

## **B. ROUTE REVIEW**

In addition to the route and the times and dates of travel, most permits also specify the number of escorts required (both civilian and law enforcement escorts), the origination and final destination points, curfews, and other restrictions.

1. Compare the permitted route to an actual map to make sure the route specified is understood. The route should be compared to roadway construction information, seasonal restrictions, or other potential route problems.
2. Review the route for railroad crossings and get information about crossing profiles, change in slope, number of tracks, road condition, and topography. It is also important to consider nearby traffic lights or stop signs to ensure loads do not have to stop on or within several feet of any railroad crossing.
3. Check the route survey for information about utility lines, overpasses, and other overhead obstructions (if load is tall), and for weight restricted bridges, based on load vehicle dimensions and infrastructure limitations. Use bridge clearance, weight and width restriction data made available by State departments of transportation in hard copy or on websites.

## C. ESCORT VEHICLE AND EQUIPMENT PREPARATION

1. Check escort vehicle:
  - a. Tire condition and pressure, including spare tire and tools.
  - b. Hoses and all fluid levels.
  - c. Vehicle insurance verification and registration documents.
  - d. Spare parts inventory, basic hand tools, fluids, bulbs, etc.
  - e. Ensure all glass is clean inside and out.
2. Check to ensure all escort equipment is in/on vehicle for each state along the route, including (but not limited to):
  - a. Warning light (also referred to as the amber light).
  - b. OVERSIZE LOAD signs.
  - c. Flags.
  - d. Radio (and back-up unit, batteries, etc.).
  - e. Stop/slow paddle.
  - f. Fire extinguisher(s).
  - g. Reflective triangles, cones, and/or flares.
  - h. Maps.
  - i. Flashlight and cone.
  - j. Height pole, if required.
  - k. Hard hat, safety vest, other safety apparel as conditions dictate.

## D. PILOT/ESCORT VEHICLE OPERATORS CHECKLIST

The P/EVO should:

1. Check that P/EVO certification card and driver's license are in the vehicle and are not expired.
2. Have had adequate rest and be free of fatigue.
3. Be healthy, taking no medication that negatively affects alertness.
4. Not be wearing a badge, shield, emblem or uniform that resembles those used by law enforcement officers (see 18 U.S.C. §. 912).



## II. PRE-TRIP SAFETY MEETING

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A pre-trip safety meeting is required by many States, and it is important for this meeting to involve the load driver, all pilot/escort vehicle operators (P/EVO), and, via telephone when needed, law enforcement escorts, permit officials, utility company representatives, railroad officials, tillermen/steermen, and others involved with load movement. ***For longer trips, a pre-trip safety meeting should be conducted before getting underway each day.*** This meeting should be focused on specific conditions and hazards expected. The same is true for vehicle inspections: after each meal, rest stop, or fuel stop, each driver should inspect his/her vehicle and assist other drivers to check bulbs, fluid levels, tire pressure, etc. Remember, **inspection is a process, not an event.**

Drivers involved in moving oversize loads should constantly monitor the other vehicles for bulb failure, low tires, signs and flags, load shifting or other issues, etc.

Assist the load driver when necessary if any problems with the load arise, including tie downs slipping or load shifting, low tires or blowouts, etc.

### A. ASSIGN TASKS

1. Discuss roles and responsibilities for each team member (lead P/EVO, rear P/EVO, height pole operator, traffic control/flagger, tillerman, etc.).
2. Discuss load driver and/or law enforcement escort expectations.

### B. REVIEW ROUTE

1. Ensure all team members know the route, turn by turn (even rear escort drivers).
2. Discuss safe places to stop if needed for equipment malfunctions, heavy traffic, etc.
3. Remind team members of any potential hazards related to the specific load.

### C. REVIEW LOAD LIMITATIONS

1. Ground clearance.
2. Load height.
3. Turning limitations.

### D. TEST COMMUNICATION EQUIPMENT

1. Select channel and alternate channel.
2. Review communication procedures and terms (lane designations, for example).
3. Check back-up equipment, locate extra batteries.

## ***WHEN PRE-TRIP ACTIVITIES ARE NOT POSSIBLE***

### ***The Modified Pre-Trip Meeting***

In some situations, P/EVOs engage in non-stationary transfers of responsibilities, or what is referred to by some as a “pick up on the move.” This situation occurs when the load doesn’t stop, but the escorts do stop traveling with the load as new escorts pick up the escorting responsibilities. This arrangement is challenging because of the lack of information, contingency planning, and knowledge about the other team members, their skills and preferences. Sharing information and planning for contingencies are delayed in a non-stationary transfer, but they should be delayed no longer than absolutely necessary.

At the first opportunity to conduct the delayed safety meeting, the procedure for the pre-trip meeting should be followed, including permit review, route review, and vehicle inspections. During this meeting, the team should also correct any issues with communication equipment, exchange contact information, and review any information that is unique to the load and route.

This modified pre-trip meeting should be conducted with as little pressure to “get back on the road” as possible. Understanding the tasks, hazards, and limitations saves substantial time when one considers the consequences of not completing the pre-trip meeting, which may include getting back on a route after a wrong turn, or prompting enforcement officials to conduct safety checks that can be very time consuming and sometimes very costly.

At a minimum, the successor escort must know how the transfer is to take place. Will the P/EVOs overlap or will the transfer be an abrupt change? If P/EVOs overlap, it is possible for the successor P/EVOs to have a few miles to “read” what the departing escorts are doing, and this overlap, when it lasts until the location for the safety meeting is reached, creates a safer environment for highway users and the load and driver. If an overlapping P/EVO transfer isn’t possible, the load and successor escorts should take the first safe opportunity to conduct the meeting, inspections, and reviews. This abrupt-change option should be the exception rather than the rule, as it poses the greater risk of the two “pick up on the move” options.

Until the meeting place is reached, minimum safety procedures must be followed:

1. Ensure effective radio communication is possible.
2. Identify team members and their positions.
3. Be clear when giving your own name and position in order to help others recognize your voice.
4. Ask for information about the load and current status of the move.
  - a. Have the P/EVOs who are departing been monitoring anything in particular?
  - b. Any emerging problems or concerns prior to new P/EVOs joining the team?

## III. LOAD MOVEMENT

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It is the primary responsibility of the pilot/escort vehicle operator (P/EVO) to protect and enhance public safety. Exactly how that task is completed varies substantially based on the load vehicle characteristics, aspects of the route, the time of day, traffic volume, maneuverability limitations of the load vehicle, and myriad other factors.

### A. KNOW THE LOAD

P/EVOs must remember that the oversize load is operationally more difficult to drive and has more blind spots. The oversize load is less maneuverable, takes longer to stop and accelerate, and has a wider turning radius. Drivers of oversize load vehicles have difficulty maintaining speeds on roads with moderate to severe grades. The oversize load vehicle is less stable, may be more likely to roll over, and is subject to trailer sway, rearward amplification, tail swing, offtracking, and other phenomena.

- Oversize loads require an extended distance to stop, change lanes, and pass other vehicles. P/EVOs assist by warning motorists when the load is going to change lanes, pass another vehicle, etc.
- Oversize loads have more blind spots, and the blind spots are larger than in other vehicles. It is important for the P/EVO not only to warn motorists to keep them from colliding with a load they may not be able to see and/or may not accurately assess its size, but also to warn load drivers of hazards they cannot see, and to warn the driver in time to avoid colliding with another vehicle or transportation infrastructure.
- Oversize loads have difficulty gaining sufficient speed on acceleration ramps to merge with traffic on multi-lane highways, and may have difficulty braking on long or steep downgrades.
- When making turns, the oversize load may swing wide before turning. And, an extremely long load may block at least two lanes of the roadway it is turning from as well as simultaneously blocking at least two lanes of the roadway it is turning onto. P/EVOs should know how to control traffic anytime the load is blocking a lane of traffic, especially when the load must move into oncoming traffic. When authorized, P/EVOs should continue to control traffic until the travel lane is clear. See Part IV below for additional information.
- When first engaging gears on an inclined surface, the oversize load may roll backward. The rear P/EVOs must be aware of this and prohibit vehicles from getting too near the rear of a load when on an incline.
- Try to avoid situations that require the load driver back up. If backing is not avoidable, P/EVOs should serve as spotters, as described in Part IV.

## B. KNOW THE LAW

It must be clear to individuals operating pilot/escort vehicles that they must stop at all stop signs and traffic lights, must yield to oncoming traffic, and must follow all laws and regulations in the jurisdictions in which they operate. It is never appropriate for P/EVOs to ignore stop signs, traffic signals, speed limits, or move-over laws; to cross centerlines; to run motorists off the road; or to violate any other traffic laws. And, it is the responsibility for P/EVOs to know the rules in each State in which they work. This is the same rule for individuals with basic driver's licenses or commercial driver's license holders: all drivers must know the rules and laws anywhere they drive.

1. States/jurisdictions—Each carrier must have a permit for each oversize load vehicle for every State through which the load will travel.
2. Permit restrictions—The permit will typically establish the dates and time of travel, prescribe the route, and the number of P/EVOs required.

## C. POSITION VEHICLES IN COMPLIANCE WITH STATE REGULATIONS AND PERMIT REQUIREMENTS

1. Lead P/EVO responsibilities.

Maintaining an attentive and proactive visual lead is perhaps the most important skill that front (also called “lead”) P/EVOs must cultivate. Monitoring obstructions such as signs, guardrails, and mailboxes is critical to the safe movement of oversize loads, but monitoring is only the beginning of this task. If the distance between the escort and the load is too small, or if the P/EVO does not notice the hazard in time to notify the driver, no amount of monitoring will ensure the safety of highway users, the load driver, the P/EVOs, and the transportation infrastructure. Even if the P/EVO has time to notify the load driver about the hazard, there may be no time left for the driver to avoid it due to inadequate following distances. This also highlights the vital nature of effective communication equipment and processes.

The visual lead every member of the team should maintain varies with the speed of the traffic, weather conditions, features of the terrain, and other factors. Similar to recommended following distances, an adequate visual lead should be at least 20 seconds for oversize load movement, and more lead time should be added for each hazard that exists in a given situation, such as a wet roadway, darkness, hills and curves, driver fatigue, or traffic congestion. The lead P/EVO is responsible for warning motorists and load team members about:

- a. Traffic approaching from the front, especially other large vehicles.
- b. Obstacles and hazards such as stranded vehicles, pedestrians, and bicyclists.
- c. Traffic congestion.
- d. Upcoming turns.
- e. Construction work zones.
- f. Edge drop-offs, low shoulders, potholes, especially on entry and exit ramps.



- g. Objects on the roadway.
  - h. Overhead obstructions, height pole strikes.
2. Rear P/EVO responsibilities

When the P/EVO is behind the load, the tasks for safe load movement include watching motorists approaching from the rear, watching the amount of traffic behind the load, and reporting information to the team. Additionally, the rear escort (also known as the chase car) must watch the load vehicle itself to report load shifting, flat tires, tie-down malfunctions, and anything about the load and load vehicle that might interfere with safe load movement.

The rear P/EVO protects highway users and assists the load driver in changing lanes and merging onto highways by “protecting” the lane(s) needed by the oversize load. To summarize, the rear P/EVO is responsible for notifying the load movement team about:

- a. Traffic approaching from the rear, especially other large vehicles.
- b. Load issues (loose tie-downs, load shifting, etc.).
- c. Load vehicle issues (tires, brake/tail lights, etc.).

## D. PREPARE FOR LOAD MOVEMENT

1. Put on safety vest.
2. Ensure signs and flags are in place according to State-specific rules.
3. Turn on warning lights.
4. Engage cameras and audio recording devices.
5. Set trip odometer/record mileage.
6. Adjust mirrors, head restraint, and seat.

And, in the last few minutes before the load moves, perform:

7. *Paperwork check*: Be sure licenses, P/EVO cards, Transportation Worker Identification Credential cards (if needed), insurance verification forms, permits, the route survey, and maps are present.
8. *Vehicle check*: Verify that all required equipment for all States is being used, warning light and headlights are on, signs are displayed, flags are in place, and that the height pole is installed and calibrated, if required.
9. *Route check*: Ensure all load movement team members know the route, and specifically review the first few turns, and all known hazards up to the next stop. Discuss curfews and parking issues, identify the next planned stop and any emergency pullover areas along the route. Discuss details of the destination and delivery of the load prior to departing on the final portion of the trip.
10. *Traffic Control Plan(s)*: Review flagging procedures for narrow bridges or turning long loads. Ensure all team members know what to do and when to stop traffic when required and allowed.

11. *Communication equipment check*: Select the communication channel and test all equipment, identify team members, and establish voice recognition.
12. *Emergency procedures*: Review with the entire team the immediately relevant emergency procedures, such as getting lodged at a railroad crossing or experiencing a vehicle breakdown.

## IV. TRAFFIC CONTROL

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It is frequently the case that pilot/escort vehicle operators (P/EVO) may need to control traffic during the movement of oversize loads. Equipment and procedures for flagging traffic are somewhat standardized from State to State; however, **the authority for P/EVOs to control traffic is not consistent across States**. Further, when controlling traffic in a temporary situation (known as *temporary traffic control* or TTC), P/EVOs face a particularly dangerous situation in part because the flagger does not have the advantages typically found in other traffic control situations, such as construction work zones.

Unlike construction zones, there are no advance warning signs (Flagger Ahead, or One-Lane-Road signs, for example) for P/EVOs. TTC zones “present constantly changing conditions that are unexpected by the road user. This creates an even higher degree of vulnerability for the workers and incident management responders on or near the roadway,” according to *Manual on Uniform Traffic Control Devices* (MUTCD)<sup>2</sup> Section 6D.03. The lack of advance warning devices, combined with the unpredictability inherent in moving oversize loads, produce additional risks for flaggers in TTC situations.

For these reasons, it is vital the flagger be positioned so that he/she will be seen by motorists. Several factors affect where the flagger should be located. First, how fast is traffic moving? The P/EVO must consider stopping distances based on how heavy a vehicle is, how fast it is moving, whether it is on a down slope or not, whether the roadway is gravel or asphalt, wet or dry. When considering the position for the flagger, consider how long it will take for the largest, heaviest, fastest moving vehicle that may approach the flagger to stop, and place the flagger in a position that allows adequate stopping distance for that vehicle.

### A. KNOW THE LAWS ABOUT FLAGGING AUTHORITY, EQUIPMENT, AND PROCEDURES

States typically require P/EVOs to carry a STOP/SLOW paddle and wear safety apparel (for example, hard hats, retroreflective apparel, etc.). Depending on the laws of each State, P/EVOs may be involved in both planned and unplanned traffic control situations. A typical ***planned flagging situation*** would be when a wide load requires narrow bridges be closed to other traffic. An example of an ***unplanned situation*** would be when the load vehicle breaks down or the load shifts. It is important to keep in mind that even if the P/EVO is escorting a load that moves only during daylight, this does **not** mean the P/EVO won't be flagging traffic after dark, especially in the event that the load becomes disabled.

<sup>2</sup> The FHWA has incorporated by reference the *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD), pursuant to 23 CFR 655.601(d)(2).

## B. DEVELOP AND FOLLOW A TRAFFIC CONTROL PLAN (TCP)

When the need to control traffic arises (for example, to get around an obstruction on or near the roadway or on a narrow bridge), make and follow a plan for how the team intends to go about getting traffic stopped before the load approaches the narrow bridge, makes a turn, or performs other maneuvers that involve encroaching on other lanes of traffic.

In summary, conditions to be considered when deciding where to place a flagger may include how fast traffic is moving, features of the terrain, and the condition and type of roadway surface. Other considerations may include weather, light conditions, and traffic volume.

## C. USE PROPER EQUIPMENT AS REQUIRED

1. A **STOP/SLOW paddle** of at least 18" x 18" with a reflective surface is required [2009 MUTCD Section 6E.03]. The paddle must be octagonal, and the STOP face must be red with white letters, while the SLOW face must be orange with black letters. It is also advisable to have a 24" STOP/SLOW paddle for higher speed roadways where traffic is moving at more than 60 mph. A 7-foot pole for mounting the STOP/SLOW paddle should be available for situations in which traffic may need to be controlled for longer than 10 to 15 minutes. Some States require the P/EVO to carry an extra paddle because load drivers are not required to carry one, and most collisions happen at intersections where more than one lane of traffic may need to be controlled.

The STOP/SLOW paddle may be modified to improve conspicuity by incorporating either white or red flashing lights on the STOP face, and either white or yellow flashing lights on the SLOW face. The flashing lights may be arranged in any of several patterns. (See MUTCD Section 6E.03 for details on light placement and other specifications.)

2. **Hardhats** should comply with American National Standards Institute (ANSI) requirements and/or requirements of the States. Type II hardhats (as required by the States) are recommended for P/EVOs because they reduce the force of impact from off-center, the side, or the top of the head. These types of impact may result from contact with any protruding part of a load. The hardhat for the P/EVO is also used to increase visibility when flagging traffic.
3. **Safety vests** are required for flaggers and others involved in roadside operations, and according to the MUTCD Section 6D.03 High-Visibility Safety Apparel Standard, they must meet ANSI Performance Class 2 or 3 requirements for daytime and nighttime activity. The background (outer) material color should be fluorescent orange-red, fluorescent yellow-green, or a combination of the two, with similarly colored retro-reflective material visible at a minimum of 1,000 feet.
4. Many States also require P/EVOs to carry a **24" x 24" red flag** (or red-orange or fluorescent versions of those colors) for controlling traffic in an emergency when no STOP/SLOW paddle is available. At no time is the flag (or a STOP/SLOW paddle) to be held outside the window of a moving vehicle in an effort to stop traffic.

5. **Reflective cones and/or triangles** are required by many States. At least three bi-directional emergency reflective triangles are recommended even in States that may not require them. Some States require traffic cones of various sizes, and still others require the P/EVO to carry flares. With respect to truck drivers, the Federal Motor Carrier Safety Administration allows these warning devices to be used in addition to triangles, but not in lieu of them. Placing a cone or triangle across the lane being controlled helps motorists know exactly where the flagger wants the car to stop and also provides an extra measure of safety for the flagger.
6. P/EVOs should carry at least one operating **flashlight/traffic wand** equipped with a safety nose cone. The light should be LED and visible for 500 feet. The wand should be impact and water resistant and have a non-slip handle. The on-off switch should be visible night or day. P/EVOs should carry extra batteries and bulbs.
7. Communicating accurate information in time to respond to hazards is central to safe operations. **Two-way radios**, compatible with those of the load driver and other P/EVOs on the team, and capable of transmitting and receiving signals for at least ½ mile are required by most States. In spite of leaps in sophistication and capabilities of personal communication devices, including smart phones, **CB radios remain the best communication equipment for the load movement team.**

In the same way that drivers should drive defensively, so should flaggers remain alert and ready to act defensively. Flaggers should be handling no other devices, and other workers should not congregate near the flagger to avoid causing a distraction. The flagger should not be positioned near other vehicles and must not block egress in any direction. The flagger must keep focused on approaching traffic at all times.

## D. DEFENSIVE FLAGGING GUIDELINES

Flagging control, as prescribed in the 2009 MUTCD, Chapter 6E, shall be followed. The flagger should stand either on the shoulder adjacent to the road user being controlled or in the closed lane prior to stopping road users. Flaggers must be in the **standard position** (right shoulder of lane being controlled), the place motorists are used to seeing stop signs. The flagger must use **standard equipment** (STOP/SLOW paddle, same shape and colors as all other stop signs), at the **standard height** (7-foot pole, so the paddle is at the same height as other signs) and wear standard safety gear (hardhat, safety vest) to control traffic. Standardization is a matter of safety, especially when drivers are being required to stop.

The flagger must display the STOP/SLOW paddle in the place drivers typically see signs. This is an important example of standardization that enhances safety for the motoring public and the load movement team. Motorists do not look for stop signs in moving vehicles. Flagging traffic involves getting out of the vehicle.

As mentioned, the flagger should (or as required by the States or MUTCD Part 6E.07) not attempt to control traffic from a moving or stationary vehicle, or by parking a vehicle across lanes of traffic, especially at highway speeds. This behavior is exceedingly dangerous and irresponsible. One of the first rules new drivers are taught is to never, ever stop in a roadway. P/EVOs are not authorized to break any traffic laws, and this includes parking a vehicle in a roadway.

### ***FLAGGING DOS AND DON'TS***

- Be alert.
- Remain standing at all times, and face oncoming traffic.
- Park vehicles off the road and away from the flagger station.
- Never turn or look away from oncoming traffic.
- Never stand in the path of moving traffic.
- Never stand near or between parked vehicles on the roadside.
- Nothing should be near the flagger—no devices such as music players or smart phones. Roadsides are inherently dangerous.
- No person should be near the flagger. Other people may distract the flagger, or, worse, may be hit along with a flagger by an errant vehicle.
- ***Under no circumstances should a flagger stop flagging until the blocked lanes(s) are clear.*** This is true regardless of whether the P/EVO is controlling traffic behind the load or controlling oncoming lane(s) of traffic.
- Never lean on vehicles; be polite but brief. Never argue with a motorist.

### ***ADDITIONAL TRAFFIC CONTROL ISSUES***

If a driver ignores the flagger's instructions, do not stop flagging. First, warn people in the control zone/activity area of the presence of the errant vehicle. Get a description of the vehicle, including the tag number if possible. Finally, report the motorist to authorities.

Flaggers should have frequent breaks (no more than two hours of flagging, or as required by the States). The hotter, colder, windier, or wetter the conditions, the more frequently flaggers should have breaks.

It is important for P/EVOs to be aware of traffic conditions at nearby intersections, especially in high-volume intersections and/or during peak traffic times. It is important that P/EVOs avoid causing potentially dangerous situations, including traffic backups at intersections or on exit and entry ramps, for example. Traffic tie-ups create an environment that is ripe for collisions. Note that when an intersection exists within the activity area, an additional flagger may be needed to control traffic entering from that intersection.

Remember, emergency vehicles have priority. When emergency vehicles approach, flaggers should stop all traffic under their control until the emergency vehicle has cleared the area.

### ***TRAFFIC CONTROL AUTHORITY***

As a reminder, States differ in the authority extended to P/EVOs to control traffic. Many States allow it, but others do not. As mentioned, if P/EVOs are not authorized to control traffic in a given jurisdiction, the responsibility for doing this is typically delegated to law enforcement officials—and these officials are in charge of the load movement while they are engaged in the traffic control process.

## V. SPECIAL CHALLENGES

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### A. RAILROAD CROSSINGS

Because railroad crossings and other grade fluctuations present high levels of risk for oversize loads with low ground clearance, pilot/escort vehicle operators (P/EVO) must be familiar with the oversize load and its limitations in order to be able to warn highway users and load drivers of problematic crossings.

The combination of high-profile crossings and low-clearance vehicles presents great challenges in moving oversize loads. Railroad tracks are built up to create effective drainage. Frequently, abrupt changes in the level of the road surface as the road crosses the tracks increases the risk of low clearance vehicles becoming stuck at the crossing.

All railroad crossing and grade changes should (or as required by the States) be included in the route survey, along with emergency contact numbers for each crossing. **This information should be reviewed daily**; that is, before starting travel for the day, the load movement team should be reminded of the procedures to be followed if the load should become lodged at a crossing. However, it is important to remember that the decision about whether to traverse a crossing remains with the load driver.

The hazards include the fact that trains cannot stop quickly. It can take more than a mile for a train to stop once emergency brakes are applied. In addition, freight trains average a mile in length and travel at 50 to 60 mph and more.<sup>3</sup>

In addition, it is critical to remember that many trains have hundreds of passengers on them, and stopping distances for passenger trains are comparable to those for freight trains. A 150-car freight train at 50 mph needs 8,000 feet (1 and 1/2 miles) to stop; an 8-car passenger train at 79 mph needs about 6,000 feet (1 and 1/8 miles) to stop.

Stopping distances for trains are substantially longer primarily because of the weight of the train, but stopping a train includes processes similar to those involved in stopping other vehicles: stopping distance is the sum of perception time, reaction time, brake lag, and braking distance. The contact area between a train's steel wheels and the steel rails is about the size of a dime, producing limited amounts of the friction that is needed to stop a train.<sup>4</sup>

<sup>3</sup> Federal Highway Administration, *Pilot Car Escort Best Practices Guidelines*, FHWA-HOP-04-026 (Washington, DC: FHWA, 2004), p. 25-26.

<sup>4</sup> Ibid.

**When an engineer sees an obstruction  
at a crossing, effectively about a  
half-mile ahead of the crossing, it is  
already too late to avoid a collision.**

Vehicles with a deep-well or low-boy chassis are used to gain vertical clearance when transporting large loads through tunnels and under bridges. These trailers, however, may not have sufficient ground clearance to traverse high-profile rail crossings or other grade changes. Other vehicles, particularly long loads, may exceed the space available between highway-rail crossings and nearby highway-highway intersections or traffic control devices. This creates a situation in which a load may become stuck on the tracks during a red light. These situations must be avoided. A load vehicle should never start across a track or series of tracks unless the load can traverse all the tracks without stopping and without shifting.

### ***IF LOAD BECOMES LODGED AT A RAILROAD CROSSING***

Hanging up on a railroad crossing is a dangerous predicament, and is becoming too common as more very low trailers are manufactured. Lowboy trailers, car carriers, moving vans, and possum-belly livestock trailers are particularly susceptible, as are single-axle tractors pulling a long trailer with landing gear which is set to accommodate a tandem-axle tractor.<sup>5</sup>

If hung at a railroad crossing, first, **get out of the vehicle and off the tracks**. Locate the crossing information (if it isn't on the route survey or permit), and call the railroad to let them know the vehicle is lodged on the track.

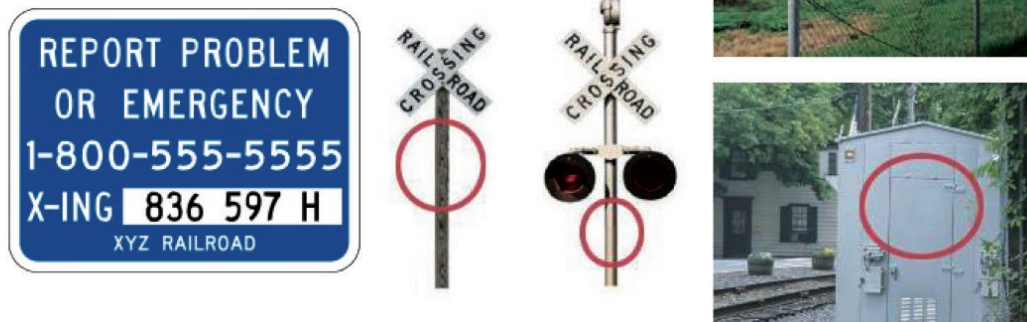
- Get out of the vehicle and off the tracks immediately. Do not go back onto the tracks for any reason.
- Move away from the tracks. Move TOWARD an oncoming train, and AWAY from the tracks. When a vehicle is struck by a train, debris moves in the same direction the train is moving.
- Locate the emergency phone number and department of transportation crossing identification number (this should be included in the route survey) located near the intersection of road and rail. (See illustration below.)
- Call for help. Call the railroad's emergency phone number to let them know the vehicle is lodged on the track.
- Call the local police or 911. This is especially important if you cannot locate the railroad emergency phone number at the site. Describe the situation and the exact location. Ask local authorities to notify the railroad and assist on site as soon as possible.
- If a train approaches, move as far as possible from the track(s).<sup>6</sup>

<sup>5</sup> American Association of Motor Vehicle Administrators, *AAMVA Commercial Driver's License Manual*, (n.d.), p. 2-28 to 2-30. Available at: <http://www.aamva.org/CDL-Manual/>.

<sup>6</sup> U.S. Department of Transportation, *Accidents That Shouldn't Happen: A Report of the Grade Crossing Safety Task Force to Secretary Federico Pena*, p. 28. Available at: <http://safety.fhwa.dot.gov/xings/docs/taskforcereport.pdf>.



## Railroad Identification, Emergency Phone Numbers, and DOT Number Locations.



Source: Federal Motor Carrier Safety Administration

**Figure 1: Illustration. Information for reporting trouble on a track.**

Detailed plans about the response of each individual team member if the load becomes lodged at the crossing should be set out during the pre-trip meeting. Every member of the team must know how to find the emergency contact information for railroad companies and what his or her exact responsibility is if this hazard becomes an emergency. P/EVOs should assist local law enforcement in controlling traffic until the issues are resolved and the load is safely off the tracks.

### *Railroad Crossing Safety Reminders*

Based on safety information from Operation Lifesaver, the Federal Motor Carrier Safety Administration (FMCSA), American Association of Motor Vehicle Administrators, and others, P/EVOs must keep the following things in mind when the designated route includes railroad crossings:

- **Never race a train to a crossing.**<sup>7</sup> Slow down when approaching a crossing in case a train is present. Be prepared to stop at the first railroad warning sign, at least 15 feet from the crossing.
- **Look up and down the tracks.** It is difficult to judge the distance and approach speed of a train. If in doubt, be safe, stop, and wait.
- **Keep your rear in the clear.** Trains are wider than the tracks, typically 6 feet beyond the rail.<sup>8</sup> Be sure to leave some “living” room.<sup>9</sup>
- **If it won’t fit, don’t commit.** FMCSA states, “Do not enter a crossing unless you can drive completely through without stopping.” Further, because trains are wider than the track, there must be enough room on the other side for the back of the truck and any overhanging cargo to avoid stopping until the load is at least **6 FEET** past the last rail at the crossing.<sup>10</sup>

<sup>7</sup> American Association of Motor Vehicle Administrators, *AAMVA Commercial Driver’s License Manual*, (n.d.), p. 2-29. Available at: <http://www.aamva.org/CDL-Manual/>.

<sup>8</sup> Ibid.

<sup>9</sup> Operation Lifesaver, “Highway-Rail Grade Crossing Training for Professional Truck Drivers,” (n.d.). Available at: [http://oli.org/images/page/OLTDGuide15stayalive\(1\).pdf](http://oli.org/images/page/OLTDGuide15stayalive(1).pdf)

<sup>10</sup> Federal Motor Carrier Safety Administration, *7 Steps for Safety: Highway-Rail Grade Crossings*, FMCSA-ESO-06-0014 (Washington, DC: FMCSA, 2015 revision). Available at: [https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/docs/Highway-Rail%20Safety\\_English.pdf](https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/docs/Highway-Rail%20Safety_English.pdf)

- **Don't expect to hear a train** both because of the noise inside the vehicle and the sounds of the engine. Don't rely on the signals. Don't rely on the train whistle. Noise inside the vehicle may be too loud to hear the warning.
- **Remember that a full stop is required for certain vehicles** and cargo, especially hazardous materials and tankers. When stopping, be sure to watch traffic from behind, and turn on emergency flashers when stopping to reduce the likelihood of being struck from behind.
- **Be especially alert at passive crossings**—those that do not have gates or flashing red signal lights.
- Remember that **multiple tracks require multiple checks**; a train on one track may hide a train on another track.
- **Be cautious about obstructions that may block the view of an approaching train**—vegetation, buildings, standing railcars, etc.
- Be completely sure that the load is able to **cross all tracks without changing gears, braking, or stopping**.<sup>11</sup> FMCSA recommends the load driver keep moving once starting over the tracks, even if lights start flashing and the gates come down. Make sure any traffic lights or stop signs are far enough past the tracks to allow the load to completely cross and be an adequate distance from the tracks before stopping.
- **Expect a train on any track at any time**. Approach each crossing with the expectation that a train is coming.<sup>12</sup>
- **Be alert to weather** and how it affects conditions at the crossings, such as impaired sight distance and substantially increased stopping distances not only for highway traffic but also for the train.
- Recognize that in certain areas and at certain times, **trains may have several hundred passengers** on them.

As a quick reference, print the FMCSA's railroad safety visor card and put one in every escort vehicle and the load vehicle(s). Be sure to mention the rules and hazards of any crossings anticipated for that day at daily pre-trip meetings, and review the contingency plans. Verify the contact information for notifying railroads of emergency situations.

## B. TALL LOADS AND OVERHEAD OBSTRUCTIONS

When loads are tall, the lead P/EVO must use a height pole. States vary, but if a height pole is required it is typically specified on the permit. Height pole operation is designed to prevent the load from hitting bridges, power and utility lines, signs, traffic lights, and other primarily overhead obstructions. In many States, a load is considered over-height if it is taller than 13' 6", although Western States frequently have higher thresholds.

<sup>11</sup> American Association of Motor Vehicle Administrators, *AAMVA Commercial Driver's License Manual*, p. 2-30.

<sup>12</sup> *Ibid.*, p. 2-28.

The height pole should (or as required by the States) be made of a non-conductive, non-destructive flexible material and should (or as required by the States) be securely mounted on the escort vehicle in order to avoid creating a hazard to surrounding motorists and vehicles, transportation infrastructure, the escort vehicles, or the load vehicle. The height pole is mounted on the front of the lead escort vehicle and must be calibrated as described below.

The P/EVO operating the height pole must have an unobstructed view of the pole and must be far enough ahead of the load to be able to communicate to the load driver in enough time to get the load stopped before striking any overhead obstruction.

### ***CALIBRATION OF THE HEIGHT POLE***

States vary in what they require when installing the height pole; the established best practice is that all height poles should be, at a minimum, set from 3 to 6 inches above the tallest part of the load. Measure the load and set the height pole, with the assistance of the load driver. Confirm the height with the load driver.

## **C. STEERABLE TRAILERS/TILLERMAN OPERATIONS**

A tillerman or steerman is an individual who steers any axle of an articulated trailer. The FMCSA has revised current regulatory guidance<sup>13</sup> on the role of the “driver” versus that of the “tillerman,” a person exercising control over the movement of a steerable rear axle on a commercial motor vehicle. The agency had previously determined that although a tillerman does not control the vehicle’s speed or braking, the rear-axle steering he/she performs is essential to prevent the trailer from offtracking into other lanes or vehicles or off the highway entirely, and because this function is critical to the safe operation of vehicles with steerable rear axles, the tillerman was considered a driver and thus subject to commercial motor vehicle (CMV) regulations. However, the agency more recently concluded the person operating the steerable rear axle should be classified as a “tillerman.” FMCSA indicated it considers the tillerman’s physical location in, on, or around a CMV to be the most relevant factor in determining whether the person is a driver, and that anyone controlling a steerable rear axle from outside the CMV would be doing so under the direction of the person in the cab, and therefore should *not* be considered a driver.<sup>14</sup> (See 49 CFR Parts 383 and 390 for clarification.)

As with most other P/EVO regulations, it is necessary to check with the State agency that oversees oversize load permits and P/EVO operations to find out what the rules are regarding steering articulated trailers. It is not recommended and unlawful in many States, for a single individual to perform two driving tasks simultaneously; that is, functioning as both the P/EVO and the tillerman at the same time. This is true regardless of how the trailer is steered. In many States, a tillerman/steerman must have a Class A commercial drivers license.

<sup>13</sup> “Regulatory Guidance on the Designation of Steerable Rear Axle Operators (Tillermen) as Drivers of Commercial Motor Vehicles,” A Rule by the Federal Motor Carrier Safety Administration issued on June 06, 2011, *Federal Register*. Available at: <https://www.federalregister.gov/articles/2011/06/06/2011-13902/regulatory-guidance-on-the-designation-of-steerable-rear-axle-operators-tillermen-as-drivers-of>

<sup>14</sup> “Groups ask for clarification on ‘tillerman’ definition,” *Commercial Carrier Journal*, June 6, 2011. Available at: <http://www.ccjdigital.com/groups-ask-for-clarification-on-%E2%80%98tillerman%E2%80%99-definition/>.



## VI. EMERGENCY PROCEDURES

Carriers, as well as escort companies, often have strict policies about what to do in an emergency situation. However, State laws also specify what motorists are required to do in the event of a collision or incident involving traffic control operations. These laws include not only those that directly affect pilot/escort vehicle operators (P/EVO), but also those that apply to all drivers in any emergency situation.

### A. INJURY ISSUES

States have specific laws governing what motorists are to do if they are involved in or witness a roadway incident. Many of these laws make distinctions between injury collisions and those involving only property damage. In addition, States typically have rules about treatment of injured people. For example, if a medically qualified person is at the accident scene and helping the injured, motorists should stay out of the way unless asked to assist. Motorists should not move an injured person unless the person is in danger; for example, the injured person is near or inside a vehicle that smells like gasoline, or the injured person is walking around or lying on a roadway and in danger of being struck by another vehicle. Activities such as keeping the injured person as still and calm as possible and contacting medical assistance and family members are consistent with State laws regarding emergency situations.

Emergencies have several common characteristics:

- An emergency is **unexpected**.
- An emergency **threatens one or more people**.
- Threats may **be real or possible**.
- Emergencies demand a **rapid, sometimes immediate, response**.
- Responses **may reduce or mitigate** an emergency.

It is also useful to consider what an emergency is *not*. An emergency is not the same as risk. Risk is *exposure to the possibility* of physical injury, damage, financial loss or gain, or delay as a result of uncertainty associated with taking a specific action.<sup>15</sup> Risk is a probability of an event and is mitigated by maintaining insurance policies, carrying spare parts, and other acts of being *prepared* for emergencies.

Emergencies span a range of activities with regard to oversize load movement. **Traffic emergencies** involve vehicles that collide with other vehicles, transportation infrastructure, or obstacles in the roadway. **Vehicle emergencies** occur when tires, brakes, or other parts of the vehicle, the load, or load securement devices fail during operation. Another form of emergency especially relevant to the movement of oversize loads is roadside breakdown. In many situations, it isn't possible to get the oversize load completely off the roadway. This presents hazards to motorists, especially when traveling at night, during heavy traffic, or in bad weather or low visibility situations. Accidents and incidents create emergencies, and the choices made by P/EVOs and load drivers contribute substantially to the outcomes of emergency situations.

<sup>15</sup> Cooper, D. and C. Chapman, Risk Analysis for Large Projects: Models, Methods and Cases (Somerset, NJ: John Wiley & Sons: 1987).



## VII. ASSIGNMENT CONCLUSION/POST-TRIP ACTIVITIES

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Once the load is delivered, parked, and secure, the pilot/escort vehicle operators (P/EVO) has important tasks remaining. These include immediate duties related to the escort vehicle itself, such as turning off lights and removing flags, but several other post-trip activities, covered in the next section, are critical to improve safety and efficiency in oversize load movement over the long haul.

### A. IMMEDIATE POST-TRIP DUTIES

1. Turn off warning light(s).
2. Remove or cover Oversize Load sign and remove flags and height pole.
3. Record vital data (termination point, date/time, delivery paperwork, vehicle mileage).





## VIII. ASSIGNMENT EVALUATION/QUALITY ASSURANCE REVIEW

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As mentioned in the Overview, each trip is prototypical for pilot/escort vehicle operators (P/EVO): *regardless of similarities that may exist among multiple trips* (identical load, same vehicle configuration, same load driver, same route, etc.) **aspects of each trip are unique** (weather, hours of daylight, vehicle failure, work zones, unexpected road closures, etc.). This means that each trip is a valuable source of information, and the experiences of the entire team should be evaluated for lessons on how to make operations safer not only for all highway users, including load drivers and P/EVOs, but also to improve the safety of the load, the load and escort vehicles, other vehicles, and the transportation infrastructure.

A post-trip review is an opportunity for team members to voice concerns and suggest possible changes to operating procedures. Discussions about what went right, what went wrong, and what can be done better are critical. Team members must feel safe to raise issues and offer suggestions.

Information gained during the evaluation should be captured and distributed in a written report. By doing this, team members who cannot be involved in the actual post-trip meeting can get the information about what was learned and aspects of the load movement that may be modified if/when similar situations arise. The after-trip report provides feedback about the performance of team members, the adequacy of pre-trip planning, as well as the operations during the load movement. In addition to evaluating the overall assignment, specific topics to address in post-trip evaluation include the route survey, communication equipment and processes, and the adequacy of any emergency responses, as discussed below.

### A. TRIP LOGS

Post-trip evaluations, including written reports, should include discussion about all aspects of load movement, including the adequacy of pre-trip planning, preparations for the move, operating procedures used during the trip, and, if an emergency occurred, the adequacy of the team's response to it. When writing reports, be inclusive. Make every attempt to include both the comments and recommendations that have been agreed to during meetings and other interactions as well as suggestions for changes in procedures. Front and rear facing cameras, still cameras, and digital voice recorders are all useful to keep accurate records of events during load movement. These materials should be preserved as part of the trip log.

Trip logs should include a detailed summary of the assignment: the dates of the trip, origin and destination, load description and vehicle configuration, description of the route, and information about emergencies, inadequacies, and malfunctions. Record names of team members, the carrier and P/EVOs, as well as support personnel and notifications documentation. Emergencies should be documented in every detail possible, including onboard camera footage and still photographs.

The report should address any training needs that are apparent, the levels of experience that are needed, and any special expertise required, such as height pole operation, route survey specialist, or P/EVOs with experience moving long loads. The focus of the report is inherently to provide an honest critique of the trip. The report need not be negative; rather the focus of the critique is to learn from experience. The report should address the primary question: based on the experience gained on this trip, how can we do a better job?

Written trip logs, as well as any video and audio recordings should be completed, filed, and labeled for future use when needed. This is true for any assignment, but is especially important if an incident occurred, including a collision, a negative inspection result, or any other emergency that may have occurred. These documents are important sources of information when P/EVOs are considering similar loads, similar routes, or working with certain companies or P/EVOs.

### ***EVALUATE ASSIGNMENT***

Each member of the team should be encouraged to evaluate the overall load movement process. This should be done as soon as possible after the load movement is complete for several reasons. First, once the team disperses to different jobs or home States, a face-to-face meeting is less possible. Second, memories and issues related to the trip will be most accurate and inclusive immediately at the conclusion of the trip, rather than at some later time. It is important to point out that whoever leads this meeting must ensure that team members feel safe to discuss any aspect of the trip without reprisal or having their ideas and thoughts belittled or ignored. The goal is to get as much information as possible from each of the team members.

The focus of the assignment evaluation should be on the procedures used to assess and address risks during pre-trip planning and related meetings. This evaluation addresses the following questions:

1. During planning, were the risks assessments adequate?
2. Did additional risks become apparent during load movement?
3. Were procedures designed to reduce risk adequate? Were plans specific enough?
4. Did all team members know and understand the roles they were assigned?
5. What should be done to correct any risk assessment deficiencies?
6. If an emergency did occur, what was the impact on public safety? The load movement team? The load? Infrastructure?

The report should provide an accurate assessment of:

1. The quality/adequacy/accuracy of advance communication about assignment.
2. The quality/adequacy of the pre-planning process.
3. Whether there was adequate/accurate risk identification.
4. The adequacy of addressing unforeseen risks and emergency situations.

***EVALUATE ROUTE SURVEY***

1. Accurate and complete?
2. Information provided useful to load movement team?
3. Adequate identification of potential hazards?
4. What would make the route survey better? What might be added?

***EVALUATE COMMUNICATION EQUIPMENT AND PROCEDURES***

1. Did communication equipment work properly? Was the equipment adequate?
2. Was communication among team members effective and efficient?
3. Was information useful, accurate, and timely?
4. What changes should be made to communication equipment?
5. What changes should be made to communication procedures or processes?

***EVALUATE OVERALL TEAM DYNAMICS***

1. Was load movement efficient?
2. Did team members promote the sharing of information?
3. Did team members promote safe load movement practices?
4. How might the team function more safely? Were there any “close calls” or concerns?
5. How could the team function more efficiently?

***EVALUATE EMERGENCY RESPONSES***

1. Assess impact(s) on public safety and the load movement.
2. Quality/adequacy/accuracy of addressing the emergency situation.
3. Quality/adequacy/effectiveness of contingency plans.
4. How might emergency have been avoided? Impact(s) reduced?
5. Plan(s) for prevention/future events.











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