



Mid-Atlantic

Safety Lessons Learned

Mishap: Overturned Dump Trucks
Injury: None
Damage: Damage to Dump Trucks
Type of Work: Dumping Roofing Material
Equipment: Dump Truck



DESCRIPTION OF THE ACCIDENT: Two end dump and one long bed end dump trailer mishaps have happened during the past year and highlight the need for additional safety oversight by contractors

DIRECT CAUSE:

- ◆ Dumpsite not maintained in a nominally level condition (lateral slope less than 1° 2°) EM-385 16.B.15 b for long bed dump trailers.
- ◆ Material being dumped being stuck or caught in the trailer, not exiting bed freely. EM-385 16.B.15 a
- ◆ Stability of end dump truck when box is in the raised position
- ◆ Rear wheels not level due to stopping on broken concrete before dumping load
- ◆ Dump truck not inspected when it was brought onto job site and inspection not documented on a checklist.

INDIRECT CAUSE:

- ◆ Possible suspension problems for dump trucks
- ◆ Dump truck driver not following proper safety requirements for dump trucks
- ◆ Ineffective control and implementation of EM-385-1-1 safety procedures of dump site by Prime Contractor
- ◆ Dump truck checklist at being used as required by EM-385.

ROOT CAUSE:

- ◆ Prime Contractor not enforcing DOT requirements for dump trucks
- ◆ Improper conditions at dump site

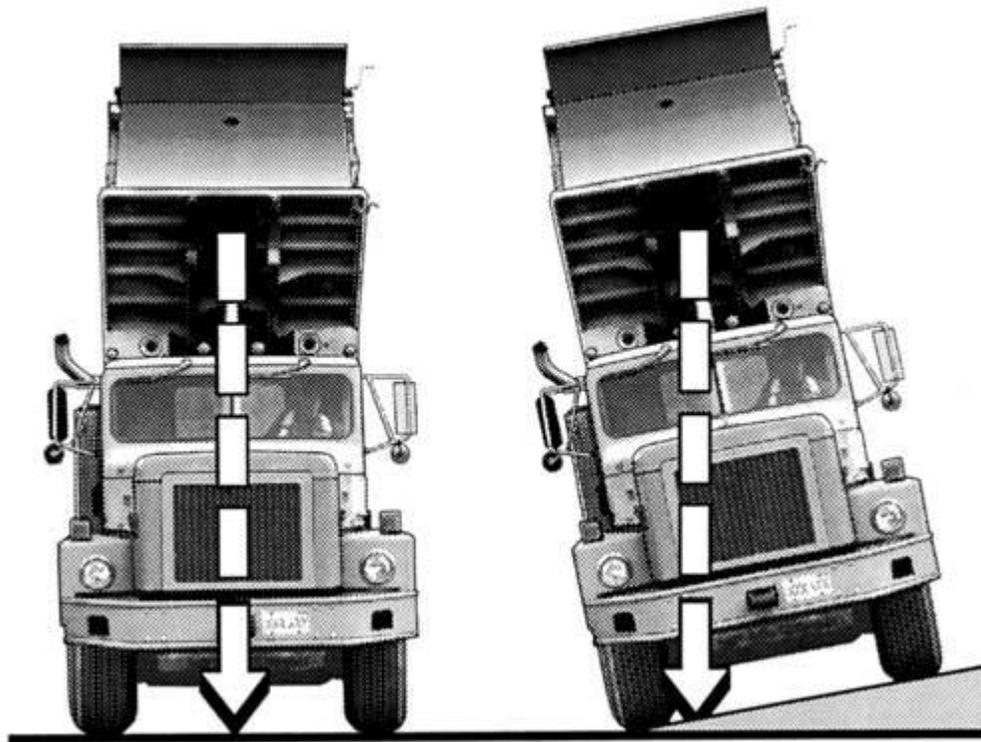
LESSONS LEARNED:

- ◆ Dump Truck checklist to be completed by operator developed in accordance with EM-385-1-1 section 18.A.02 c. Checklist attached can be used or other types as long as they cover the minimum safety requirements
- ◆ New line item #106 added to contractor safety awareness worksheet used by mid-lant safety inspection team to verify dump truck checklists are being used where needed
- ◆ Bed liners should be used when material could stick inside dump body and not flow freely.
- ◆ Preparatory meeting and using the Activity Hazard Analysis even for small events could have prevented this incident. A more thorough AHA could have prevented the accident by helping to identify problems with the dump operations and at the dump site
- ◆ Superintendent/ SSHO must ensure dump truck inspection and checklist are completed before dumping operations are started on their jobsite.

Stability

The main hazard is related to the stability of the end-dump unit when the box is in the raised position.

When the center of gravity of box and load is not roughly between the frame rails of the unit, there is a risk of tip-over (see diagram).



A slight slope can be enough to cause tipping if material sticks in the top of the box.

Stability is adversely affected by one or more of the following factors:

- the unit is not on a level surface when dumping
- a large amount of material is in the upper portion of the raised box
- material does not flow out of the top portion of the box, or does not flow out of one side of the top portion
- the rear wheels settle unevenly as the load moves to the rear during dumping
- wind may exert lateral loads, especially if the box is long, as is the case with end-dump semi-trailers.

Stability may also be affected by the unit's mechanical condition:

- **poor rear suspension systems on one side of the vehicle**
- uneven tire pressures in rear wheels
- worn or inadequate components of the lifting system such as pins
- worn or inadequate lifting cylinders.

Hazard Control

Because of stability problems with semi-trailers, they should not be used for haulage to rough grading or fill areas where surfaces are often uneven or loosely compacted. Straight trucks or straight trucks and pup trailers are more appropriate for highway haulage to these dump areas. Where haulage and dumping are all on site, straight trucks or off-highway vehicles are even better choices.

Where aggregates are being spread for road construction, belly-dump semi-trailers are more appropriate than end-dump semi-trailers.

Sometimes vehicle selection is not an option for the contractor. Material suppliers or haulers do not always use equipment appropriate to a particular site. However, when contractors do have a choice they should select equipment in accordance with these recommendations to reduce tip-overs.

Cold weather may cause materials to freeze to the box and stick when dumping. Using heated boxes will reduce the problem. During winter, loads should not be left in dump boxes overnight.

Maintenance

Maintenance can play an important role in preventing tip-overs.

- Check tire pressures daily. Tire pressures should be equal on each side of the vehicle.
- Examine and lubricate pins and bushings regularly.
- **Inspect suspension systems under load to ensure that they work properly and provide even suspension. Weak suspension systems should be replaced immediately.**
- Inspect hoist cylinders regularly. Worn cylinders should not be replaced with smaller cylinders or with cylinders rated at lower operating pressure.
- Make sure that repairs to boxes leave bottom and sides clear and unrestricted. Rough patchwork repairs near the top of the box can catch and hold sticky materials.

Loading

Loading of the box front-to-back must meet allowable gross weight and axle weight limitations . From side to side it is best to load as evenly as possible.

If material is likely to flow poorly, lighten up the load in the top end of the box. A slightly smaller load will be better than a full load that causes a tip-over.

Box liners will help most materials flow better during dumping. Liners also help to keep the box in good condition.

Dumping

Operators should be trained to recognize areas hazardous to dumping, such as soft or uneven surfaces and inadequately compacted fill.

Before dumping, operators should ensure that the tailgate is unlocked and that the vehicle is on a reasonably level surface. Dumping on surfaces that are not level is one of the main causes of tip-overs.

Before spreading material by dumping it from a moving truck, make sure that the entire length of travel is reasonably level.

Trucks should not dump when they are parked side by side with another vehicle. When a dump unit tips over, it is often the operator in the adjoining vehicle who is injured. Dumping operations should be spread out.

Other personnel such as dozer operators, surveyors, and spotters should be warned not to work near a dumping truck in case it tips over.

Workers on foot should not congregate in areas where dumping is under way.

Dump Truck Checklist
IAW EM-385-1-1 Section 18.A.02 c

Contract Name and Number:	Contractor/Subcontractor:
Contractor Competent Person:	Location:
Government Quality Assurance Rep:	Date:

Equipment name and Model number:

18. A.02 c When dump trucks are brought onto a USACE job site, they shall be inspected and found in compliance with the requirements of this Section before they are placed in service. This inspection shall be documented on a checklist

18.A.02 e Prior to each use, but not more often than daily, vehicles shall be checked <u>by the operator</u> to assure the following parts, equipment, and accessories are in	Safe operating Condition		Free of Apparent Damage	
	Yes	No	Yes	No
1. Has a AHA been written and accepted by the GDA and discussed with all engaged for this work activity? Ask Superintendent/SSHO				
2. Has a survey for work activity adjacent to overhead lines been made to ascertain the safe clearances from energized lines been done? Ask SSHO or Superintendent				
3. Is a notice of minimum required clearance for high voltage lines posted at the operator's position when operations are adjacent to overhead lines? (11.E.04b)				
4. Service brakes, including trailer brake connections				
5. Parking system (hand brakes)				
6. Emergency stopping system (brakes)				
7. Tires				
8. Horns				
9. Steering mechanism				
10. Coupling devices				
11. Seat belts				
12. Operating controls				
13. Safety devices (e.g., backup alarms and lights, fire extinguishers, first-aid kits)				
14. Accessories including lights, reflectors, windshield wipers, and defrosters where such equipment is necessary				
15. Is dump truck equipped with a holding device to prevent accidental lowering of the body while maintenance or inspection work is being done				
16. Have all hoist levers been secured to prevent accidental starting or tripping of the mechanism				
17. Are long-bed end-dump equipped with a roll-over warning device (plainly visible from the operator's position) if dumped material is subject to be being stuck or caught in trailer or the dumpsite cannot be maintained in a nominally level condition (lateral slope less than 1° - 2°). EM-385 16. B.15 a,b,				
18. Are trip handles for tailgates arranged to keep the operator in the clear				
Comments:				
Inspected By: _____ Date: _____				

This checklist is based on EM 385-1-1, dated 3 November 2003. Use of this checklist by the contractor is optional but other checklists must contain at least all the above information.