

5 Mile Dozer Tip-Over

Lessons Shared



Summary

On Tuesday, August 18, 2020, Texas A&M Forest Service (TFS) employees traveled to the 5 Mile GLO in northern Liberty County, Texas to perform site preparation operations for tree planting, using a CAT D7 dozer. When the dozer was being unloaded at the site, it shifted on the trailer and then slid off, resulting in the dozer tipping over onto its side on the ground next to the transport.

Background

The 5 Mile GLO is a piece of property owned by the Texas General Land Office and managed for timber production by the Texas A&M Forest Service. The timber on the land was harvested two years prior, so it needed to be prepared for planting this winter. The method of site preparation chosen was drum chopping. This method utilizes a large metal cylinder with longitudinal cutting blades that is pulled by a heavy dozer. As the drum chopper is pulled across the logging slash and debris, it cuts it into smaller pieces and pushes some into the soil, clearing the land for planting. This particular project had already been delayed one year.

Narrative

The drum chopper was already on site at 5 Mile GLO, and the tractor-trailer with the CAT D7 was staged behind a fire station located approximately ¾-mile from the tract. On the morning of the incident, the plan set by the five TFS employees was to convene at the fire station, drive the tractor-trailer with the dozer down the farm-to-market road to the tract, unload, and begin working. Four of the five employees arrived at the fire station at approximately 09:00. At that time, one of the employees drove a pickup to the tract to scout for a location to unload the dozer. The scout determined the tract was too wet and muddy to drive the tractor-trailer in through the gate to unload. It was decided that the shoulder of the farm-to-market road would serve as the best location since it was dry, solid, and had enough space.

At approximately 09:30, it was decided to go ahead and drive the tractor-trailer down to the tract, unload, and begin working. The last employee, a mechanic that had experience with the equipment being used, had not arrived yet, but the individuals present felt confident they could get started without him being there. They utilized a pilot and chase truck to safely move the tractor-trailer down the road to the tract. This included a truck from the fire station and two TFS pickups. They arrived on site around 09:40, parked the tractor-trailer on the shoulder of the farm-to-market road, donned orange safety vests, and began unchaining the dozer from the trailer and lowering the ramps. It was noted that the tractor-trailer was parked on a slight grade, with the passenger side of the vehicle on the downhill side, away from the roadway. Everyone there thought it was flat enough to safely unload.



Figure 1: Dozer and transport after operator exited and ramps were raised.

The individual that volunteered to unload, a carded Dozer Operator (DZOP), had operated that particular dozer before but never loaded or unloaded it. He climbed into the dozer, started it, and allowed it to warm up before

putting it in gear and slowly creeping backward. As the dozer crept backward on the trailer, the operator looked down and noticed the dozer had shifted, and the right track was slightly hanging off of the edge of the trailer. At that time, the operator stopped, took the dozer out of gear, engaged the parking brake, and got down to assess the situation. At that time, the mechanic had arrived and was able to help with the decision making. They decided that it wouldn't be feasible to try to drive the dozer forward to reposition it on the trailer because the tracks were hanging off too much, and it would likely slide more if they attempted that. At that point, they determined the best option was for the operator to continue to back off of the trailer and try to come down the ramps.

“I felt like I could have been more vocal about it looking like it wouldn't work.” – TFS GROUND MAN

The operator climbed back into the dozer and began slowly creeping backward again. Before the dozer reached the ramps, it slid further off the edge of the trailer, and then the dozer began to tip. It happened slowly, so the operator had time to turn 90 degrees in the seat and place his feet up against the side of the cage, in the direction of the fall. As the dozer tipped over and landed on its side, the operator was then on his feet inside the cab and was able to shut off the dozer and climb out without any trouble. The operator had time to react, and all personnel on the ground were standing well away from the trailer, so nobody suffered any injuries.

Immediately after the dozer landed on its side, the operator climbed out, tightened the fuel and hydraulic caps to try to prevent spillage, and then contacted agency leadership to explain what had happened. He also assigned



Figure 2: Wrecker with winch attached to dozer, pulling it over onto its tracks.

personnel on the ground to take photos and document the events. After some discussion with everyone on site, including the fire department personnel, and given the close proximity to a busy roadway, it was decided to call for a heavy wrecker to come and pull the dozer back onto its tracks. The wrecker arrived quickly, and the local fire department was utilized to help with traffic control while the wrecker parked in the roadway, hooked to the dozer with a winch, and pulled the dozer over. Afterward, any spilled fuel or hydraulic fluids were properly cleaned up so there was no soil contamination.

The mechanic had the dozer sit for about 15-20 minutes to allow fluids to settle, and then he started it. It started with no problems, and they tracked the dozer on to the 5 Mile GLO to park it there. The tractor-trailer was driven back to the fire station down the road and parked.

Lessons Learned

How flat should your loading/unloading location be?

Everyone involved recognized that the tractor-trailer was parked on a slight grade, but none thought it was steep enough to cause any issues. Some noted that they had unloaded a CAT D5 off of a bobtail transport on that amount of slope before, or steeper, with no issues. During the site visit, the FLA team measured the slope at the location to be approximately 12%. This shows that it does not take much of a slope to cause a dozer to slide during unloading or loading.

It was also noted that the slope caused the air bags on the downhill side of the trailer to deflate, resulting in the trailer tilting slightly more than the slope of the ground. How does your hauling equipment react to being on a slope?

“Don’t ignore red flags” - Operator

The operator recognized that there were several “red flags” leading up to the dozer tipping over off of the trailer:

- The tract was wet and muddy, leading to the road shoulder being chosen as the unloading location
- Everyone on site when the dozer was first being unloaded had a lack of experience with that equipment
- The one person with experience wasn’t there yet

Despite these deviations from the original plan, it was decided to proceed, which resulted in an unintended outcome. When flaws in a plan start to line up (the swiss cheese model), it’s time to take a tactical pause, reassess, and determine if work should continue.

Risk vs. Reward

The operator mentioned that this project had already been delayed by a year. Even though there wasn’t direct pressure from supervisors to get it done by a certain time, there was an unspoken sense of urgency to push through and get the work done to avoid further delays. When a plan is made, it can sometime be difficult to change those plans or walk away completely if needed, especially if it could lead to more headaches down the road. Frequent analysis of risk vs. reward are important to determine whether the plan should continue, change, or end completely.

Do you always wear your seatbelt?

The operator mentioned that when he re-entered the dozer to continue backing it off of the trailer, he forgot to fasten his seatbelt. This was uncharacteristic of him, as he stated that he always wears it, but in the midst of the unexpected events, it was forgotten. In this situation, the tip-over of the dozer was slow, so the operator was able to react in a way that prevented any injury. However, if it had happened more abruptly, not having a seatbelt on could have resulted in serious injury.

If your equipment shifts while unloading, when do you stop and explore other options?

Personnel involved with this incident considered several options before deciding to continue unloading the dozer. If there's ever a sense that equipment might not unload as it should, it's time to stop and think about other options that could ensure everyone's safety. What options are available? Wrecker? Other Agency equipment? Winch? Could you unload off of the side of the trailer? Can the transport itself be re-positioned? Always consider the safest option for your situation.

Do you have a plan in place for an incident within an incident, even in non-emergency response situations?

Thankfully, there were no injuries resulting from this incident, but the potential was there. Most people have a plan for if there is an incident within an incident during wildfire operations, but the potential for injury is present during project work as well. Are there EMT's present? Do you have phone service to call 911? If not, what is the plan to contact emergency services? What notifications need to be made? What paperwork needs to be completed? Ensure all personnel involved in any project are familiar with the steps that need to be taken if somebody is injured.