EXPEDITION FIRE- BURNED DOZER

FACILITATED LEARNING ANALYSIS

Figure 1: Wakulla 2 Tractor Plow post incident

SUMMARY

On April 27, 2012 the Apalachicola National Forest responded to a wildfire in burn unit 316 on the Wakulla Ranger District. The Expedition Fire was detected during the afternoon recon by a rotor wing aircraft at 1510. During initial attack operations an engine compartment fire in a tractor/plow unit that was building line resulted in a total loss of the equipment. This was managed as an incident within an incident. The fire plow itself sustained no damage resulting from either fire. The operator was not injured.

Weather conditions predicted for the day were 86 degrees, 41% relative humidity, 20 foot winds light and variable in the AM and Southwest at 9 MPH in the PM. Mixing height 4500 feet, transport wind speed and direction Southwest at 10 MPH.

> "I thought-How can we let a tractor burn up, but when I saw the spot-I saw how it could happen."-SME

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NARRATIVE

Initial attack resources responded from the Wakulla Work Center at 1510 to the Expedition fire with 1 Type 4 IC, 1 Tractor plow unit and 2 Type 6 engines. They arrived on scene at 1530 at the intersection of forest roads 313 and 313A. The helicopter led the resources directly to the fire. The Incident Commander (IC) requested the helicopter locate a dip site and commence bucket work. Once the IC was on scene, he ordered an additional tractor plow unit from Florida Forest Service (FFS). At this time the Wakulla Caterpillar D-6 tractor/plow unit was tracking to the fire. The IC briefed the operator of the D-6 to anchor on the heel of the fire and proceeded easterly along the heel and progress around the right flank.

The operator anchored on a road on the South end (heel) of the fire and continued east building direct fire line. Fire behavior observed at the heel was 2- 4 foot flame lengths. Once the operator turned the corner and proceeded north on the right flank, he observed intermittent flame lengths of 10 feet in patches of heavier fuels.

The operator continued to construct line, working through the larger trees and staying off the fire edge about a chain and a half in order to maintain a buffer in the thicker fuels that were present on that flank. At one point the operator attempted to turn northwest in order to get around what was thought to be an opportune place to start pinching the fire off. It was soon recognized that this was just a green finger so the operator backed out and picked a new line through the trees in a northern direction.

Figure 2: Tractor plow post incident as seen from helicopter

The operator continued building fire line to the north. Due to fuels and soft ground conditions on this flank the operator had to knock down trees and back up to clean the line out with the plow. While backing up, the operator noticed flames at the peak of the tracks coming from under the tractor on the right side. The operator immediately stopped the tractor and decelerated to get off and access the water suppression system. Once off, the operator heard what sounded like a hose rupture and witnessed the engine compartment become fully involved. The operator was unable to suppress the engine compartment fire due to toxic fumes and smoke that were now filling the cab. Due to these conditions the operator was only able to reach in the cab long enough grab the fire pack and turn off the ignition. The operator moved away from the burning equipment and then determined that nothing more could be safely attempted. The operator safely exited with his required PPE. He was unable to call the IC because he did not have his hand held radio so he made his way back to the anchor point to contact the IC.

> "Trying to figure out where the fire came from is where I'm stuck." -operator

Figure 3: Tractor on fire

At approximately 1635 the IC heard the operator shout. He responded on the radio thinking he would try that for easier communications. The operator shouted again so the IC shouted back. The operator informed him that the tractor was on fire. Given the new circumstances the IC instructed everyone on the fire to bump out to the corner of FR313 and 313A to regroup. Once the situation was assessed and reorganized, suppression resources re-engaged the wildfire. The IC requested the helicopter to locate the dozer in order to drop water in an attempt to suppress the dozer fire. The helicopter was unable to locate the dozer due to the tree canopy and smoke from the wildfire so it resumed bucket work on the left flank.

The operator remained at the staging area at the intersection until the Zone Fire Management Officer (ZFMO) arrived at 1800 and assumed command of the incident within an incident involving the tractor plow unit. The IC and the operator returned to the fire. They went back to the location where the operator originally anchored in and started constructing line and they went through a step by step recall of what had just happened. After securing control lines, all resources were released at 2230.

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LESSONS LEARNED

In the category of “Lessons Learned”, in regard to this incident, we are left with observations that the incident occurred during operations that were conducted in accordance with established guidelines and that there are no indications that a disregard, or lack of consideration, of any item addressed has occurred. So, our lessons are submitted for consideration as suggestions, reminders, and references for further exploration.

The lack of critical points that can be cited as circumstances contributing to the incident can be perceived as a good outcome, but makes identifying “Lessons Learned” more difficult and reduces a direct application or connection for future application.

The operation of these machines, in the fire environment, requires a combination of skill, experience, and adaptability to conditions. The developments in machine design, for comfort of the operator, have contributed to a reduced ability to receive signals that were commonly available before the advent of "Environmental Cab" designs. The operators mentioned that they formerly used all their senses-sight, smell, feel, hearing, and even taste to assist in situational awareness during operations.

In addition- no situation is exactly like another and this places a large responsibility on the operator to manage, consider, evaluate, and make decisions when faced with new combinations of factors that can present challenges at a constant and fast pace.

- One of the most valuable lessons learned is that policy, procedures, and protocols were followed and the operator made the right decision to exit the area and leave the equipment with ***emphasis being placed on life not property***.
- If forced to make an emergency exit from a vehicle all equipment that’s not worn, may not leave with the operator.
- Communication has to be ensured throughout an activity.
- Operations conducted by a single worker are always vulnerable considering the dynamic nature of firefighting and adherence to all safety precautions are especially necessary.
- Operations under any conditions should not be considered as being “normal” as a matter of experience or initial conditions and the corresponding activity as being predictable over the range of possible outcomes.
- The capabilities of the equipment are impressive, but mechanical things can and do fail.
- Operators should maintain their cautious attitude in evaluating conditions as they develop.
- Operator’s sense of risk during the activity was initially at a low value, up to the point where the dozer fire was observed. In a very short time the engine compartment fire advanced to a condition that made any response to fight the engine compartment fire an unacceptable risk that would expose the operator to great danger.
- The resources available at the time of the event included a helicopter, which could not locate the dozer due to smoke and tree canopy. An IC and other firefighters for a total of 6 individuals were on the fire when the dozer caught fire but were unable to respond with any assistance due to soft ground conditions that were not suitable for engines.

- The incident commander made the right decision in disengaging from the fire and re-grouping and managing the dozer fire as a separate incident.

An unforeseen benefit of the FLA process was the exchange of information in a non-threatening manner that allowed participants to express not only the factual account of the event, but also to see representatives, from outside the normal chain of command structure, demonstrate their concern and interest in an individual circumstance without a need to investigate or demonstrate the need to fix any related blame.

> "Bad things can happen on small fires."-ZFMO

This includes the benefit realized from implementing the FLA process and to document the success and realize any opportunities for future application.

Conclusion

The following day suppression crews returned to the incident. The tractor plow remained a separate incident with the ZFMO. Crews returned to the tractor to recover the plow unit that was attached to the dozer which was undamaged. The district ranger requested the State Fire Marshal return to investigate the fire in the engine compartment. The state fire marshal's report was not complete at the time this document was prepared and investigation is still pending.

The forest has fleet records from Caterpillar that indicate repairs on the pivot shaft bearing and seal were replaced on the left side of dozer, water tank repaired and the belly pans removed and pressure washed seven operating hours prior to incident occurring.

The tractor plow unit was at no time stuck or hung up. There was no direct flame impingement from the wildfire on the unit prior to it catching fire. The wildfire did eventually burn up to, and around the front of the tractor after operator left the area.

The Zone FMO made the decision to order specialized dozer operator packs that can be worn in the cab to ensure operators have all required safety equipment, including hand held radio on during fire operations. All the Forests in the National Forests in Florida will be using the new packs.

Operator has over ten years of experience operating initial attack tractor plows in the wildland fire environment. The operator sustained no injuries as a result of this event.

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