

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Surface Coal Mine

Fatal Machinery Accident
August 18, 2005

at

Smith No. 1 Mine
Thomas J. Smith Inc.
Shelocta, Armstrong County, Pennsylvania
ID No. 3608065

Accident Investigators

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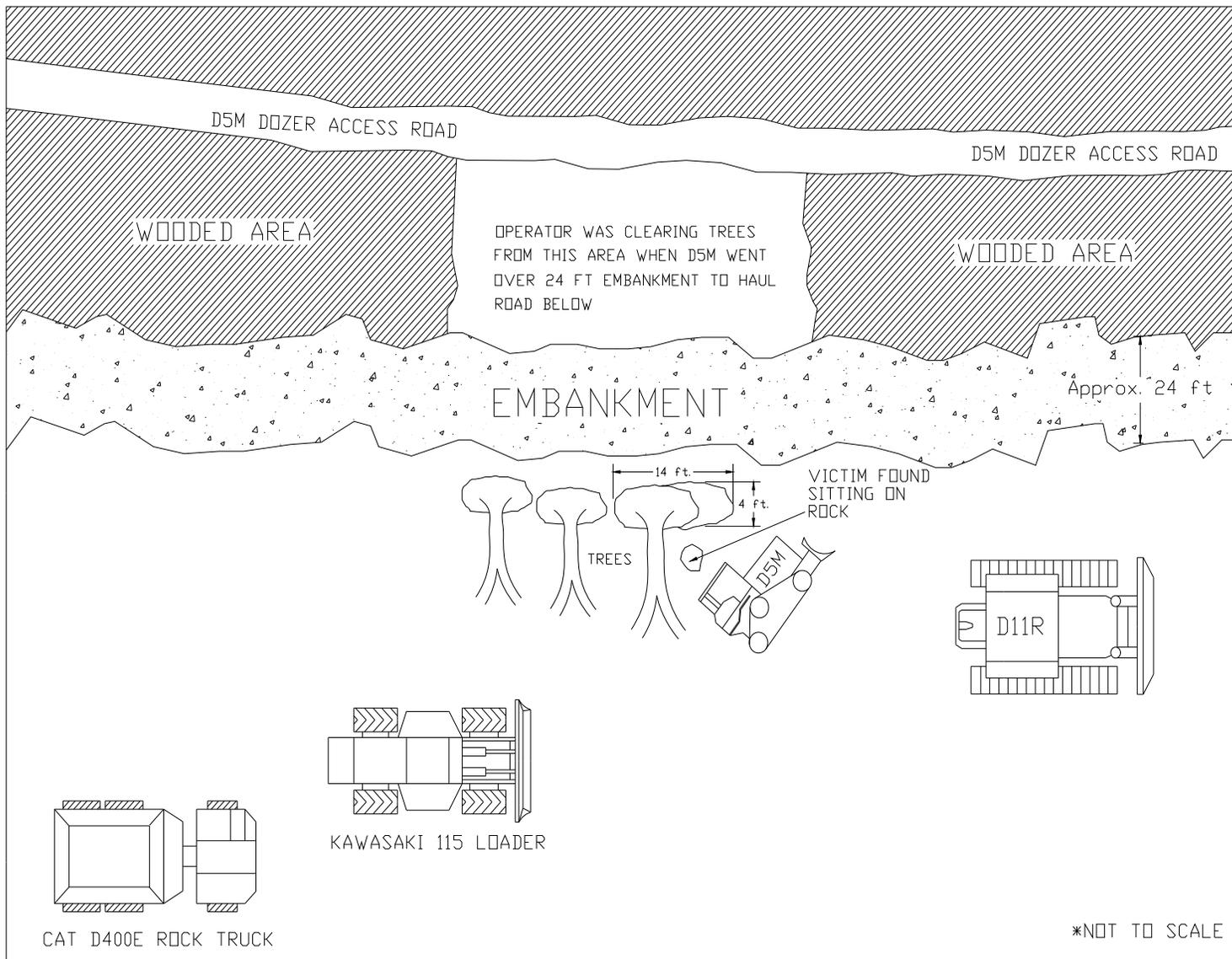
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ACCIDENT SITE



OVERVIEW

At approximately 12:00 p.m. on Thursday, August 18, 2005, a 50 year old Pit Foreman/Machine Operator, with 26 years of mining experience was fatally injured while operating a Caterpillar D5M-LGP bulldozer on a haul road being constructed to the 026 pit. The victim was clearing trees from the top of a 24 foot embankment that was located adjacent to the haul road construction site when the dozer traveled over the embankment and came to rest on its left side. The victim was not wearing a seat belt and was thrown from the cab of the dozer. He received fatal blunt force injuries to the neck and trunk area of his body.

The accident occurred because the machine used to complete the task of pushing over the large trees was inappropriate for the task being conducted near the top edge of an embankment. The severity of the accident was increased due to the fact that the victim was not wearing a seat belt.

GENERAL INFORMATION

The Smith No. 1 mine, operated by Thomas J. Smith Inc., is located in Shelocta, Armstrong County, Pennsylvania. The mine consists of one refuse pit and four production pits. This operation employs 24 miners working one, 9-1/2 hour shift, six days a week and produces 23,000 tons of coal a month. Dozers, loaders, excavators, and trucks are used to strip and load the coal. Over-the-road coal trucks are used to haul the coal to various locations.

The principal officers for the mine at the time of the accident were:

Thomas J Smith.....	President
Saundra R Smith	Secretary/Treasurer
Raymond L Bashline.....	Safety Director

Prior to the accident, the Mine Safety and Health Administration (MSHA) completed the last regular safety and health inspection on August 4, 2005. The Non-Fatal Days Lost (NFDL) injury incidence rate for the mine in 2004 was 10.42, compared to a National NFDL rate of 5.56.

DESCRIPTION OF ACCIDENT

On the morning of August 18, 2005, [the victim] and David Hankey (equipment operator) started their shift at 6:00 a.m. Work at the old pit (026) was nearly completed, and they were constructing a haul road to a new area for pit (026). The two men discussed the morning's work activities and then David began operating the Kawasaki 115 front-end loader hauling and dumping rock for the roadway while the victim used the Caterpillar D11 dozer to level the material and widen the roadway. At some point during this activity they decided to travel to the old pit and bring the Caterpillar D400E rock truck to the new work site.

When they returned to the road construction site, the victim and David discussed a row of trees located on the embankment adjacent to and above the new haul road. They were concerned that the trees could fall onto the new haul road and the victim said he would see what he could do with the trees.

About mid morning the victim took the Caterpillar D5M-LGP dozer to the old pit to do some touch up grading. When he returned to the construction area, he began pushing the row of trees over the embankment. David was in the rock truck backing down the road to dump a load of rock and saw the victim successfully push the first tree in the row over the embankment. At approximately 12:00 pm, David traveled back up the road and saw the victim pushing the third tree in the row over the embankment. As this tree fell the second tree in the row also fell and David observed the bulldozer over travel the edge of the embankment and strike the ground four feet behind the fallen trees root systems. The victim was thrown from the cab of the dozer landing among the trees in front of the root systems. The dozer rolled over the root systems and came to rest on its left side.

David parked the rock truck and ran over to assist the victim. He found the victim slumped over sitting on a rock. The victim was conscious and said he was having difficulty breathing. After assessing the victim's condition David called Sam Cessna at the scale house and notified him of the accident. David supported the victim until the ambulance arrived.

Sam Cessna called 911 at 12:16 pm. Citizens Ambulance Medic Unit 81 arrived on site at 12:30 p.m. and provided medical assistance. The victim was flown from the mine site to UPMC Presbyterian Hospital, Pittsburgh, Pa. Dr. Matthew Rosengart pronounced him dead at 1:54 pm from blunt force trauma of the neck and trunk. An autopsy was not performed.

INVESTIGATION OF THE ACCIDENT

Raymond Bashline, Safety Director for Thomas J Smith Inc., called and reported the accident to Thomas McCort, Field Office Supervisor for MSHA's Kittanning Field Office, at 4:25 pm. on August 18, 2005. An investigation was started the same day. An order pursuant to Section 103(k) of the Mine Act was issued to ensure the safety of the miners.

MSHA's accident investigation team traveled to the mine, conducted a physical inspection of the accident site, interviewed employees, and reviewed documents and work procedures relevant to the accident. MSHA conducted the investigation with the assistance of the mine employees, MSHA Technical Support, MSHA Education Field Services, the Armstrong County Coroner's office, and Citizens Ambulance Medic Unit 81. Seven persons were interviewed during the course of the investigation.

DISCUSSION

The following is a discussion of the relevant factors identified during the accident investigation.

METHOD OF MINING

Mining had not begun at this location. The miners were in the process of developing a new haul road to a proposed pit.

THE EMBANKMENT

The embankment, originally created by the previous land owner, ran parallel with the new haul road being constructed in a north west to south east direction. It was 24 feet high and consisted of shale with a top layer of sandy soil. A row of trees with overhanging root systems existed along its top edge with another tree line 21 feet further back and parallel with the embankment. The work area, in between the two tree lines on top of the embankment, was reasonably level, 35 feet long and 21 feet wide. The edge of the embankment appeared stable. Imprints of the dozer's tracks on top of the embankment indicated the dozer was pushing when it went over. There was no evidence to indicate the dozer was skidding.

TREES

The first tree in the row was 46 feet high and 15 inches in diameter. The second and largest tree was 68 feet high and 22 inches in diameter. The third tree was broken off and could not be accurately measured as to height but was 11 inches in diameter. Dozer blade marks on the second tree indicate that the victim had attempted to push this tree over the embankment but failed. This action likely loosened the tree causing it to fall with the third tree when it was pushed over the embankment.

The root system was approximately 14 feet long, 4 feet thick and 4 feet high. The dozer blade impact marks on the ground were 4 feet behind the tree's root system indicating the dozer was pushing when it went over the embankment. An impression on top of the root system indicated that the dozer rolled over the root system after impact. The location where the victim was found, along with a work glove and lunch bag indicate that the when the victim was thrown from the dozer he landed in front of the root system.

EQUIPMENT

The equipment located at the work site included a Caterpillar D11 bulldozer, Kawasaki 115 front-end loader, Caterpillar D400E rock truck, and a Caterpillar D5M-LGP bulldozer. Only the Caterpillar D5M-LGP, bulldozer was involved in the accident. After the accident the dozer had continued to run while it was lying on its side. The oil and antifreeze drained out of the dozer resulting in the destruction of the motor. A review of the company maintenance records indicated that there were no reported mechanical problems with the bulldozer. The accident investigation team conducted an inspection of the D5M-LGP dozer. The following is a list of the physical factors:

1) MACHINE INFORMATION: The machine involved in the accident was a Caterpillar Model D5M-LGP (Low Ground Pressure) bulldozer manufactured in 1998. The bulldozer had an operating weight of approximately 27,800 lb. It was equipped with a 110 horsepower Caterpillar Model 3116 turbocharged diesel engine. The hour meter located in the operator's compartment indicated 3815 hours.

2) **MACHINE DAMAGE:** The bulldozer was damaged in the accident to the extent that the engine was not operational. Actual performance tests of the braking system, transmission, and steering with the engine operating could not be performed.

3) **SERVICE BRAKE:** The service brake consists of two spring applied, hydraulically released brakes. These brake units are located in the drive assembly for each side of the machine and can be applied by pulling the steering levers all the way back or by depressing the floor mounted service brake pedal. When the machine evaluation was being conducted there was no pressure in the brake system. With no pressure in the system the service brakes should be applied. The tracks were locked on the D5M-LGP dozer.

4) **SERVICE BRAKE CONTROLS:** In order for the service brakes to be applied, the hydraulic pressure holding the brake released must be allowed to escape from the brake units. A three section hydraulic valve is used to dump the pressure so the service brake will apply. Mechanical linkages from the steering levers and brake pedal to the hydraulic brake steering valve were checked and functioned smoothly without binding or catching.

5) **TRANSMISSION CONTROLS:** The planetary type power shift transmission has three speeds forward and three speeds in reverse. The transmission is controlled by a shift lever located to the left of the operator's seat. The control has a U-shaped shift pattern and is connected by mechanical linkages to the shift controls mounted on the transmission. Placing the operator's shift control in the neutral position and in the position for each gear for both forward and reverse direction resulted in a corresponding movement on the shift controls mounted on the transmission.

6) **OPERATOR PROTECTIVE STRUCTURE:** The dozer was equipped with what appeared to be a ROPS (Rollover Protective Structure), although the tag containing SAE criteria was unable to be located during the investigation. It was later discovered that the dozer was shipped from the manufacturer without a ROPS canopy, therefore the canopy was installed at a later date. The operator's area inside the cab was not compromised during the accident.

7) **SEAT BELT:** The bulldozer had a seat belt which was found under the seat and appeared not to have been used for some time. The seat belt was undamaged, and it operated properly when tested. The victim was not wearing the seat belt at the time of the accident.

EXAMINATIONS

An on-shift examination of the work area had been conducted and there were no hazards recorded in the record book.

ROOT CAUSE ANALYSIS

An analysis was conducted to identify the most basic causes of the accident that were correctable through reasonable management controls. During the analysis, causal factors were identified that, if eliminated, would have either prevented the accident or mitigated its consequences.

Listed below are causal factors identified during the analysis and their corresponding corrective actions implemented to prevent a recurrence of the accident.

Causal Factor: Regulations for using seat belts were not being followed. There was no written company policy on the use of seat belts. The pit foreman (victim) was not wearing the seat belt provided.

Corrective Action: Management adopted safety policy to ensure compliance with safe work procedures. Management should monitor and strictly enforce the established policy regarding the use of seat belts.

Causal Factor: The machine used to complete the task of pushing over the large trees was inappropriate for the task being conducted near the top edge of an embankment.

Corrective Action: Management should evaluate the current safety, work and operational procedures in use at the mine. Management should encourage all employees to do a risk analysis any time a task is started.

CONCLUSION

The accident occurred because the machine used to complete the task of pushing over the large trees was inappropriate for the task being conducted near the top edge of an embankment. The severity of the accident was increased due to the fact that the victim was not wearing a seat belt.

Approved By:

ORIGINAL SIGNED BY

Cheryl McGill
District Manager

NOVEMBER 10, 2005

Date

ENFORCEMENT ACTIONS

1. A 103(k) Order was issued to ensure the safety of all persons at the mine until an investigation was completed and all areas and equipment were deemed safe.
2. A 104 (d) (1) citation was issued for a violation of 30 CFR 77.1710(i). The operator of a Caterpillar D5M-LGP bulldozer failed to wear a seat belt where there is a danger of overturning and where roll protection is provided. The operator was pushing trees off the top of a 24 foot embankment when the bulldozer over traveled the embankment and overturned ejecting the operator from the cab. The bulldozer was equipped with ROPS protection.
3. A 104 (a) citation was issued for a violation of 30 CFR 77.1708. The operator did not establish and maintain a program of instruction with respect to the safety regulations and procedures to be followed at the mine and he did not publish or distribute these procedures to the employees.

**Appendix A
Persons Participating in the Investigation**

Thomas J. Smith Inc.

<u>Name</u>	<u>Title</u>
Thomas J. Smith.....	President
Ray L. Bashline.....	Safety Director

Mine Safety and Health Administration

Mark R Ronan.....	Coal Mine Safety and Health Inspector (Surface)
Donald W Huntley	Coal Mine Safety and Health Inspector
Donald W Conrad	Education and Training Specialist
Michael A Hockenberry.....	Mechanical and Engineering Safety Division
Jeffrey S Moninger	Mechanical and Engineering Safety Division

**Appendix C
Photographs**



