

*This presentation is for illustrative and **general** educational purposes only and is not intended to substitute for the official MSHA Investigation Report analysis nor is it intended to provide the sole foundation, if any, for any related enforcement actions.*

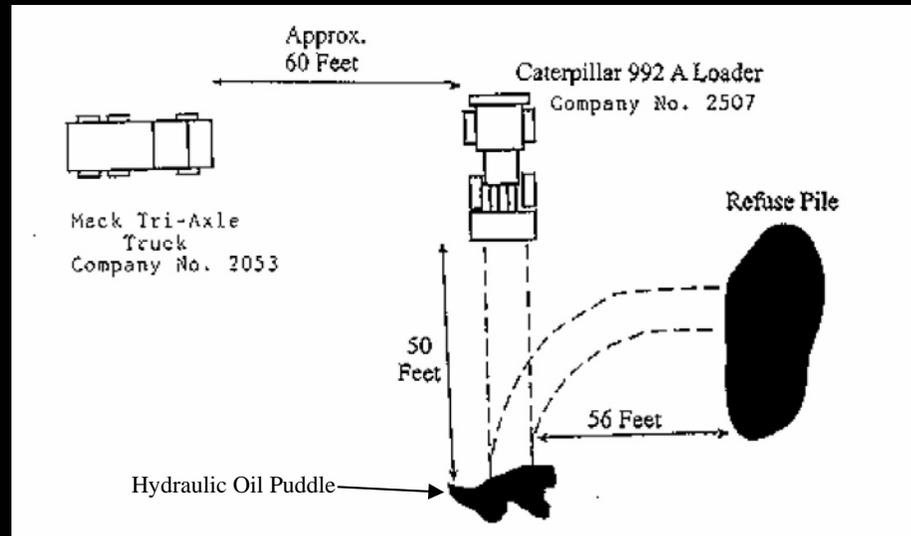
# GENERAL INFORMATION

## Coal Mine Fatal Accident 2004-21



Operator:	Jeddo Coal Company
Mine:	Jeddo No. 8 Preparation Plant
Accident Date:	October 1, 2004
Classification:	Powered Haulage
Location:	District 1, Luzerne County, PA
Mine Type:	Surface
Employment:	14
Production	1500 Tons/Day

# ACCIDENT DESCRIPTION



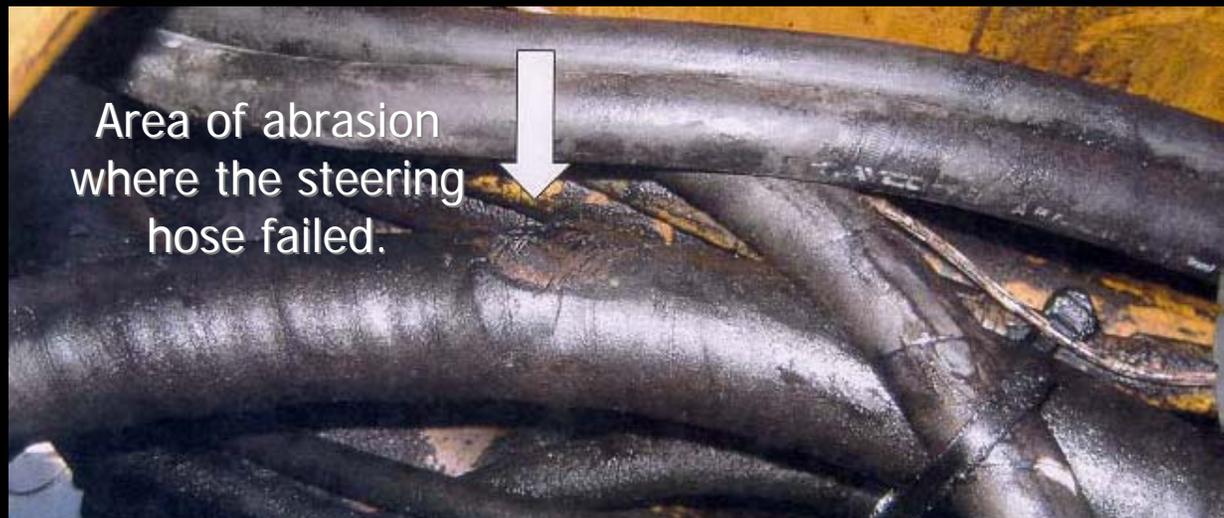
On Friday, October 1, 2004, a 51-year old front-end loader operator was loading Co-Gen material into a Mack tri-axle truck and dumping Co-Gen refuse rock on a refuse pile. As he drove the loader toward the refuse stockpile the truck driver noticed oil spraying between the operator's cab and the engine compartment of the loader. The truck driver called the loader operator on the radio and said, "... you got a big oil leak. Shut down."

The loader operator continued to the refuse stockpile, dumped the material out of the bucket, backed the loader up 56 feet, turned the loader to the left and drove 50 feet. As he stopped the loader, the oil ignited. The fire was located between the operator's cab and the engine compartment. Co-workers used seven fire extinguishers to extinguish the fire but the victim was unable to escape the cab.

# ROOT CAUSE ANALYSIS

*Causal Factor:* A steering hose, whose length was longer than the manufacturer's specifications, came in contact with other components of the loader resulting in abrasion and eventual failure of the hose. Hydraulic oil sprayed from this hose at the point of the abrasion.

*Corrective Actions:* A procedure has been established to assure that when machinery is purchased, a competent person thoroughly inspects, examines and tests the machine to assure that its components and systems conform with the manufacturer's specifications. Any deficiencies will be corrected before the machine is put into operation. The company has incorporated this policy into their safety program and the same policy will be reviewed annually during refresher training.



# ROOT CAUSE ANALYSIS

Causal Factor: The front-end loader remained in operation after a serious oil leak was observed.

Corrective Actions: Mine management has instituted a company safety policy requiring machine operators to immediately shut down whenever a significant safety defect is identified. This policy has been incorporated into the company safety program and will be reviewed annually during refresher training.

Refuse Pile  
Dumped by Loader



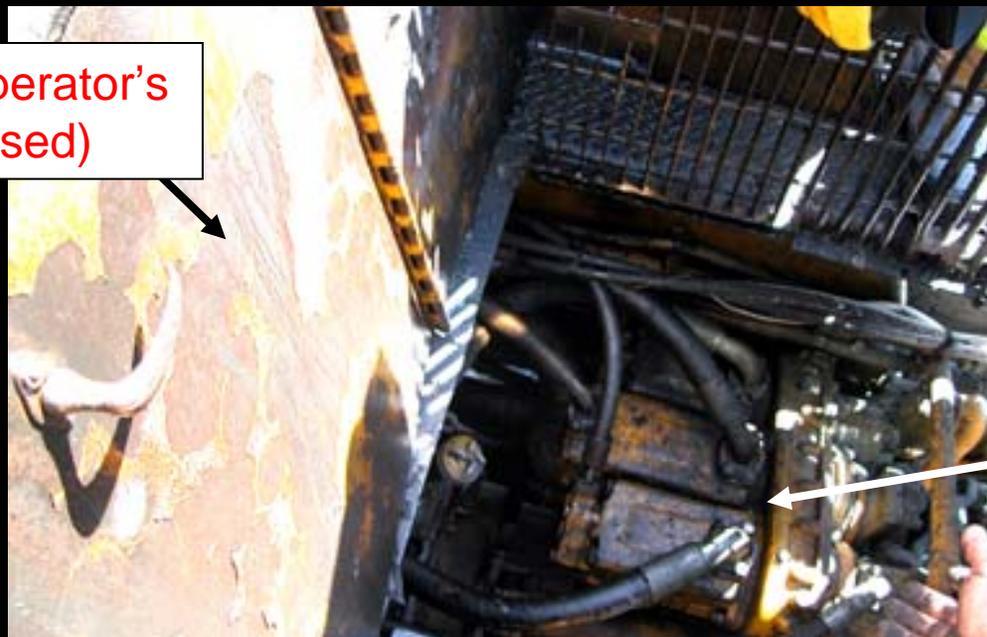
Hydraulic Oil  
From Loader

# ROOT CAUSE ANALYSIS

Causal Factor: Hydraulic oil sprayed onto turbocharger/exhaust manifold and ignited. Grating at the door to the cab did not provide protection to the route of egress.

Corrective Actions: An appropriate fire suppression system should be considered. Such systems have proven to be highly effective. The company has replaced the grating with solid flooring in area behind the operator's cab.

Outside of Operator's  
Door (closed)



Hydraulic  
Pumps

# CONCLUSION

The steering hose failed, which allowed hydraulic oil to contact the turbocharger/exhaust manifold, resulting in a fatal fire on the front-end loader. The hose failed due to external abrasion caused by contact with other components of the loader.

The accident occurred because the front-end loader was not maintained in safe operating condition. The front-end loader remained in operation after a serious oil leak was observed. The lack of a fire suppression system and open grating at the cab entrance contributed to the severity of the accident.

# ENFORCEMENT ACTIONS

104(a) Citation was issued for a violation of 30 CFR 77.404(a) because the front-end loader was not maintained in safe operating condition in that 4 hoses, the right side pump hose, the steering pump hose, the transmission hose, and the steering hose were obviously damaged, frayed, and too long according to the manufacturer's specs. The wear marks on the hose cover and its wire braids indicated that abrasion between the hose and a machine component had occurred. One was damaged to the point that a hole was created that allowed oil to spray and ignite. The fire entered the operator's cab and fatally injured the equipment operator. Furthermore, the equipment operator was warned about this unsafe condition and did not remove it from service immediately.

104(a) Citation was issued for a violation of 30 CFR 77.1606(c) because, on numerous occasions, equipment defects effecting safety were not corrected on the front-end loader before it was used. Four hydraulic hoses were removed from the loader which were obviously damaged, frayed, too long according to the manufacturer's specs. One was damaged to the point that a hole was created that allowed oil to spray and ignite. The fire entered the operator's cab and fatally injured the equipment operator .

# BEST PRACTICES

- Reduce or eliminate the potential for hydraulic fluid discharging through hose failures onto hot engine components by installing a solid shroud or shield to deflect hydraulic fluid away from these hot surfaces.
- Ensure that adequate pre-operational checks on mobile equipment are performed and that all defects affecting safety are recorded and reported. Such defects must be corrected before the equipment is used.
- Thoroughly examine all hoses, fittings, and gaskets and replace according to manufacturer's recommendations.
- Take equipment out of service immediately if a hazardous fluid leakage is observed.
- Install a fire suppression system on all mobile equipment to increase the likelihood of a safe escape should a fire develop.