



Special Report-GPS Warning System for Dozer/Glen Easton, West Virginia

Location: McElroy Mine / Prep Plant
Glen Easton, West Virginia

Project: Install hazard warning and guidance system on
Cat D11N dozer

Summary:

- Consol's McElroy Mine is located south of Wheeling, West Virginia along the Ohio River. Coal from the mine is cleaned and loaded on barges for river transportation.
- When barges are unavailable or river conditions prevent safe navigation, clean coal is stockpiled on site.
- Coal is transferred to the stockpile area via conveyor and dropped into a "stacker". It falls out through flapped doors around the structure.
- A Cat D11N dozer is used to keep the pile distributed evenly around the stacker.
- The four globes (**Fig.1**) indicate the location of underground feeders that open to a conveyor below.
- When coal can be loaded, the feeders open and the coal falls onto the conveyor.
- The D11N is also used to push coal from the outer limits of the stockpile toward the feeders. The stockpile can be as high as 80 feet above ground level.
- There is a possibility of coal bridging over as it is reclaimed, creating a void, which can be a safety hazard to the operator.
- Dozer operations often take place at night. Dense fog hanging in the river valley can also limit the operators visibility. Under these conditions, the dozer operator cannot determine where his machine is located within the work area or in relation to hazard areas.



Productivity Products and Services Provides a Solution

Dave Reitmeyer, owner of Productivity Products and Services, partnered with Carlson Software to create a system to warn the dozer operator when he approaches the feeders, tops of slope, or the overhead conveyor.



Day 1—August 15, 2005

- P.P.S., Inc.'s Tim Retter and Carlson Software's Jim Hardy and David Jordan set up Topcon's dual antenna system on the dozer and installed the Carlson computer and dozer control system software.
- Retter and P.P.S., Inc.'s Dave Krautz worked with McElroy's electrician Jeff Seckman to install the base station antenna mast assembly on the conveyer control building.
- Carlson Software's owner Bruce Carlson, Krautz, and Retter set up Topcon's GPS+ base station in the conveyer building electrical/computer cabinet.
- Krautz and Carlson verified GPS+ base antenna and benchmarks around the site with a Topcon GPS 3005 total station.



Day 2—August 16, 2005/Morning Session

- Operator orientation session was held in McElroy's onsite office.
- Dave Reitmeyer explained the basic operating principles of the system.
- Bruce Carlson and Jim Hardy (Carlson) explained operation of Carlson's software and tablet PC used as a display in the dozer cab.
- PPS & Carlson questioned McElroy staff about the limits of warning areas.

Day 2—August 16, 2005 / Afternoon Session

- Krautz and 3D-P's Ron White installed a Motorola Mesh wireless network system. This two-way data communication network will enable office personnel to monitor the dozer's location and operation. It will also allow data files to be sent to the computer/display on the dozer.
- Hardy and Dave Draskovich, McElroy's Preparation Plant Superintendent, studied warning areas for the site.
- Carlson modified 3D files for preliminary warning area.
- Hardy and Jordan trained Billy Gamble, McElroy equipment operator, in the use of Carlson Grade dozer operating software.
- Billy Gamble spent one hour operating the dozer without any further instruction.



Benefits

Safety considerations:

- Dozer operators know the exact position of their machine with relation to the stockpile, slide hazard zones radiating from the conveyor doors, hazardous slope at southwestern edge of site, and overhead conveyor structure—regardless of visibility.
- Dozer operators receive a visual warning on the in-cab display when they approach these hazard areas.

Operational considerations:

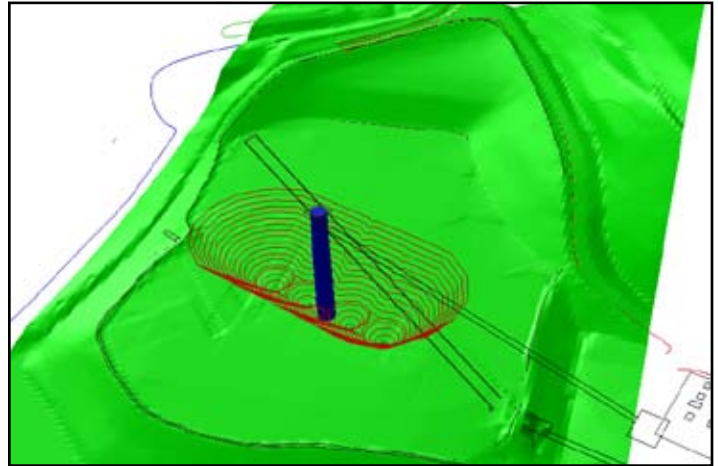
- Dozer location, site conditions, and stockpile limits can be monitored and logged on a remote office computer.
- Data files can be exchanged between computer in a remote location and the in-cab computer.



Billy Gamble, dozer operator, after his first hour with P.P.S., Inc.'s system: *"I can see where I am over the top of the feeders and how high I am above ground level. I think it's a good safety precaution. It's a big benefit when you're shoving after dark. The instruction and training were excellent. They answered all my questions. I feel comfortable about using it now."*



Dave Draskovich, Preparation Plant Superintendent: *"From what we've seen so far, this system will meet our expectations. In this application right here, it's going to give our operators a higher level of safety. If the operator knows his exact position with relation to the feeders, all the guesswork goes away. We're being proactive about safety at this site, rather than reactive."*



The install team at the end of Day Two (left to right):
 Jim Hardy, Dave Reitmeyer, Billy Gamble, Tim Retter, Dave Krautz, and David Jordan.
 (Bruce Carlson and Ron White not present)



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