

EQUIPMENT TODAY

Video Technologies Increase Safety

Cameras and event recorders reduce guesswork.

By Curt Bennink

Electronic video technologies make it possible to operate your trucks and heavy equipment on crowded jobsites and roadways, while simultaneously lowering risk factors. Cameras and event recorders are tools that, when properly used, can lead to a safer working environment.

Camera technology offers several benefits. "While safety is the primary consideration, additional benefits include avoiding increases in insurance premiums resulting from injuries to pedestrians or destruction of equipment and/or other vehicles," says Sibyl Ringsdorf, manager of marketing and national accounts, Rostra Precision Controls. "In addition, downtime associated with damage to the vehicle or equipment could affect completion of a project, resulting in additional profit loss."

Tom Clark, account executive, Safety Vision, agrees, noting, "The advantage that gets the most publicity is safety. You are trying to give the driver an extra set of eyes. Another advantage that people don't really realize until they start using the cameras is just extra visibility. If you have a driver who has to maneuver through a tight situation and he is by himself, instead of getting in and out of the vehicle many times, he can use the cameras with the extra visibility to maneuver. That increases efficiency on the job."

In the case of Safety Vision, the cameras also incorporate microphones. "You can have communication from somebody behind the vehicle up into the cab," says Clark.

Many cameras are available with either black and white or color monitors. "We have black and white camera systems, which are the traditional cathode ray tube (CRT)," says Clark. "In the last few years, we have really seen a push toward the color liquid crystal displays (LCDs) just because they take up so much less space in the cab. You are also getting the

advantage of color vs. black and white. On a jobsite, that comes in real handy, because a lot of the safety vests just jump out on screen."

Another consideration is low light conditions. "Our cameras have infrared illuminators to help them perform in low light situations," says Clark. "Even if it is pitch black outside, where they would be blind with just mirrors, it will help light up the area behind the vehicle just like broad daylight."

Keeping drivers in the cab

Cameras can do a lot more than provide rear visibility. "You can use them for lining up to a trailer," says Clark. "Some customers use them to watch conveyor belts. You can use them to check the load in the

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*— Ed Luce,
Vulcan Materials Company*

bed of a trailer. It is really unlimited what you can use them for — it is just wherever you need extra visibility."

This extra visibility is exactly what Vulcan Materials desired to help achieve its safety objectives. Vulcan Materials Company is one of the largest aggregate producers in the United States. Its Western Division has a total of about 390 ready-mix trucks. "Here, in Southern California, we operate about 120



With the use of camera technology, drivers for Vulcan Materials can see directly behind the truck and monitor the material flowing down the chute from the safety of the cab.



Video technologies can be used like another mirror, and allow drivers to monitor conditions while staying safely out of harm's way. Shown is a driver for Vulcan Materials Company monitoring concrete coming down the chute of his ready-mix truck.

ready-mix trucks," says Ed Luce, area operations manager for ready-mix operations in Southern California.

The company safety goal is zero injuries. "Some of the ways we achieve this goal in the ready-mix area is to require all drivers to review pre-job checklists before every job, and to have our job service reps go to the jobsites in advance to assess hazards before jobs," says Luce.

But the company is always looking for ways to improve. For example, Luce and his drivers were aware of the hazards posed for drivers at concrete pumps. "Risks exist because the pumps operate at high pressures." Elbows and areas along the hose line can burst under this pressure.

"In the past our drivers got outside their trucks to watch the flow of the concrete and make necessary adjustments in the rate of speed at which it came down the chute," says Luce. "Even though the drivers wear all required PPE (hard hats, glasses, shields, gloves, etc.) — protecting them from the debris of possible explosion — a pump explosion might also lead to other injuries," Luce notes.

"Some drivers have incurred injuries to their knees and shoulders when they twisted or jumped to get away from a pump explosion."

Vulcan started looking for solutions to keep drivers inside their trucks and away from the pumps. Off-the-shelf solutions did not adequately meet Vulcan's demands. "Anybody can provide a camera for looking right behind you when you are backing," says Luce. "Depending upon the type of pump and how high or low it was, or the angle the driver backed in on, that one rear-view camera mounted somewhere near the hopper wasn't sufficient all of the time to keep the driver away from the pump."

This is where a partnership was formed with Safety Vision. "We purchased two cameras for every truck," says Luce. "We had the rear view. The other one is detachable. We attach it to the chutes. This development process took over a year."

To control the hazard, Vulcan's team considered several camera configurations and arrangements until it selected the best design, which included mounting an adjustable bracket for the camera on the chute. "Now, if the driver needs to adjust the camera, the driver can make the adjustment safely and return to the cab before the material begins to flow down the chute," says Luce. "The new arrangement keeps the driver away from exposure to potential pump failure. Drivers can sit in their truck with the windows rolled up and watch the concrete come down the chute."

The new arrangement also provides added protection to the drivers from noise exposure. "We require ear protection," says Luce. "But allowing the driver to return to the cab provides additional protection." To help minimize noise exposure for its ready-mix concrete truck drivers, Vulcan requires the installation of air conditioning in all of its ready-mix concrete trucks.

The results have been impressive. "My ultimate goal is to keep drivers away from the pumps 95% of the time," says Luce. Unique jobsites and other conditions make 100% nearly impossible. "So there are

Survival in the Rough

Even the best technologies are useless if they can't live in the construction environment. Dust and moisture are significant hazards.

In the case of Vulcan Materials, cameras are constantly exposed to water. "If you take a typical driver, let's say he averages four loads a day," says Ed Luce, ready-mix manager, Western Division. After each load, the truck is thoroughly washed down. "Four loads a day over the term of a year, is a lot of... exposure for the cameras."

The cameras must be able to live in this environment. "I don't have time for our shop personnel to go out there and continually service or replace cameras. We have enough things to concentrate on other than the cameras," Luce states. So durability is a huge issue.

"All of our cameras are weatherproof, and we utilize a threaded O-ring sealed connector where the camera attaches to the video cable," notes Safety Vision's Tom Clark. "There are other ones on the market that are like a snap-type connector. That is susceptible to moisture or corrosion."

Shock and vibration resistance are also critical. Clark recommends looking for a high shock and vibration rating. For instance, LCD monitors are generally more rugged than CRT monitors. "With an LCD monitor, all of the transistors and capacitors are surface mounted to the board itself," he explains. "So in a high vibration application, an LCD will outperform a CRT for reliability over time."

some constraints. But in working with Safety Vision, we have been able to greatly reduce exposure. In my perspective, it is only fair to the drivers."

Drivers report the rear-view camera is a useful tool to ensure workers on the jobsite stay clear of the trucks. "Our perspective is it is just another mirror — another tool for our drivers to use," says Luce.

Vulcan justifies the investment through increased safety and improved conditions for drivers. "We will do what needs to be done to keep the drivers safe and healthy," says Luce.

Currently, Vulcan is in the process of prototyping and evaluating several event recorder systems, as well.



This camera mounted on the chute allows Vulcan's drivers to stay clear of concrete pumps.

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