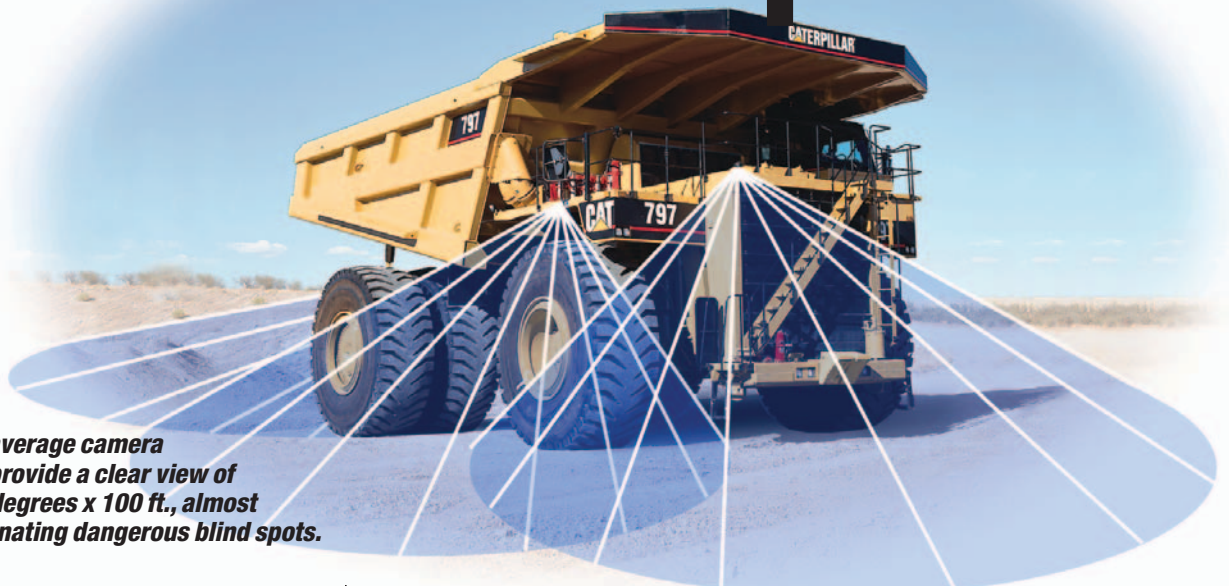


CONSTRUCTION TRUCKS

Opting Out of Blind Spots



The average camera can provide a clear view of 125 degrees x 100 ft., almost eliminating dangerous blind spots.

EXPLORING THE PROS AND CONS OF SAFETY CAMERAS

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indsight is always 20/20, but a bit late after backing over a pick-up truck with a haul truck. And though companies can't change the past, they can have the foresight to change the future by watching their behinds. Rear-vision cameras were first used about 20 years ago by refuse haulers and operators of other street vehicles whose routes required drivers to frequently back up. Cameras and monitors running up to \$2,000 per installation, however, were susceptible to heat and vibration and no match for a quarry environment.

But innovations during the past 10 years have allowed cameras to withstand the stressful elements of the aggregates industry, says Safety Vision VP of Sales Rex Colorado. Tube cameras the size of bread boxes have been

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replaced by lightweight cameras the size of a fist. The small components are surface mounted and handle more stress. Cumbersome, black-and-white monitors for cab interiors have been replaced by 1-in. thick color LCD units, while infrared technology provides the driver a clear view from dusk to dawn.

A clear view is paramount when driving a vehicle that is so unforgiving. During the production of an in-house safety video at a Pennsylvania plant, Hanson Aggregates/Central Safety Director Dave Pfile once watched a 50-ton haul truck back over a pick-up. "Dear Lord, did it squash it. The (haul truck) driver said, 'I never felt anything.'"

At Hanson Aggregates/Central, Pfile has not logged a backing accident and, with rear-vision cameras, he hopes to keep it that way. That sentiment is not confined to his region. Plants at Hanson Aggregates/Mideast often have pick-up trucks near the dump blocks. "But the cameras pick those up right away," says Mobile Equipment Supervisor Curtis West, who has rear-vision cameras on the rear differentials of five haul trucks.

Aside from added safety, West says the cameras increase efficiency on the dump blocks. The operators can see precisely where the block is when backing in and when a load stops dumping. Also, operators can see rocks that spill onto the road and notify loaders to remove them.

Aggregate Industries, which like Hanson Aggregates has materials operations across multiple regions, began equipping haul trucks with rear-vision cameras two years ago, says Safety Director Al Quist. The



The Safety Vision SV-CLCD65 rear-vision system has an SV-620 camera, SV-LCD68 color flat-screen monitor and the SV-LCDCB control box. The waterproof, threaded metallic connector is sealed with a rubber O-ring.

company has installed the cameras on its Cat 777 and 773 haul trucks, as well as several loaders including Cat 992 and 880C models. This summer, Quist will finish installing cameras on a fleet of 300 mixer trucks operating in Colorado.

Within three regions, Aggregate Industries has installed 250 Safety Vision SV-CLCD65 camera kits that average \$1,148. The kits include a 6.8-in. monitor, a control box and an SV-620 camera. The components are connected by a waterproof, threaded O-ring cable. The monitors can accommodate up to three cameras, and an optional splitter can allow for a fourth.

Aggregate Industries began with a single SV-5000 black-and-white unit that Safety Vision provided on a trial basis. The unit's price is about \$648. Quist says most operators were satisfied with the results, but there were a few complaints.

The black-and-white monitors would not show the neon-green vests worn by employees. So the company upgraded to color LCD screens that are similar to plasma televisions. The new monitors occupy less space, which was another concern regarding the black-and-white monitors. The LCD monitors' visibility, however, is hampered by glare in direct sunlight, though a monitor shade will partially eliminate glare.

Quarry dust on the camera also can limit visibility after a few days,

Quist says. But cleaning the lens is just a matter of wiping it off or even pressure-washing it. The glass that encapsulates the camera is scratch-resistant, and the housing is 12-gauge steel. Quist says the mixer trucks are the most problematic because of cement dust, sand and slurry. But a concrete truck has to be hosed down after every delivery, so "that's a driver issue, not a camera issue," Quist says.

Another problem was static on the screen caused by interference from the CB radios, he adds. That was easily remedied, however, by moving the monitor higher in the cab and moving the CB unit behind the seat.

Intec Eastern Region Sales Manager Dan Pinney says radio interference is rare and usually the result of very high-energy radio systems of 100 watts or more. Shielding the unit or moving it, as Quist did, are quick solutions.

Despite a few minor glitches and annoyances, the cameras do what they were intended to do—decrease accidents.

Hanson and Aggregate Industries are not alone among major producers who have chosen to improve drivers' operating perspectives. Oldcastle Materials Group has experienced a 12 percent de-

crease in preventable motor vehicle accidents, primarily in mixer trucks. Steve Benton, co-chairman of the group's Safety and Best Practices initiative, attributes a large part of that decline to the use of cameras. Benton is now installing more cameras on mobile quarry equipment.

An independent player in northern Illinois, Thelen Sand and Gravel, had 17 backing accidents in 2002 and only two in 2003 after installing the cameras, says Safety Director Chad Broege. The two involved in accidents were not equipped with cameras. "It's definitely worth the investment," Broege says.

"We have reduced backing accidents, and are looking forward to eliminating them 100 percent," adds Aggregate Industries' Quist. "We still have them, but those are with equipment that does not have the camera."

He says the equipment rarely

An angled, rear-mounted camera eases wheel loader backing in aggregate operations.



malfunctions. If it does, it fails right away while still under warranty. The cameras, however, can take the abuse of a stone quarry. Each has a 10G vibration rating and monitors have 4G.

"The big plus is they have great clarity and visibility in darkness," Quist says. The Safety Vision units are equipped with electronic irises that regulate the light and infrared technology for working in the dark. The cameras also are equipped with a microphone so the driver can hear what a person within view says.

Safety Vision National Sales Manager Steve Sappol says cameras decrease the likelihood of accidents and property damage. They also increase efficiency by allowing the drivers to maneuver in tight spaces by watching the monitor rather than jumping out of the truck to look.

Intec, which created the first car vision system, provides two systems suited for the mining industry, the CVC230SXL and CVC320XL. Its systems range from \$1,000 to \$3,000. Dan Pinney says both units are 9G vibration-resistant and waterproof.

"Moisture is the number one killer of cameras," Pinney says. The XL units are equipped with military-spec connectors that create a vapor barrier to protect against the moisture that destroys lenses and circuitry.

A CCD directs light into the camera,



A fist-sized, side-mounted camera provides a clear view of the passenger side blind spot.

and an electronic iris varies the shutter speed to accommodate light and dark environments, Pinney says.

Average cameras can see 125 degrees x 100 ft. Pinney says if operators need to see more than 100 ft., they are driving too fast. For rear vision, the camera is commonly mounted on the chassis of a haul truck for a view that shows a portion of each tire. Cameras can also be mounted to eliminate blind spots on the passenger side and front.

Quist says anyone who can install a CB radio can install a camera system. The process requires tapping into a 12/24-volt power source and routing the cable through the engine compartment to the camera. He says it takes about two hours, depending on the equipment and the routing of the cable.

Pinney says a common installation mistake is routing the cable too close to heat sources or moving parts. Intec cables are coated with polyurethane, but even those can wear under extreme circumstances. A few times, Pinney says, cables have melted after being routed too close to the turbocharger.

A melted or severed cable can short a camera conductor and blow a camera or monitor. The Intec XL

systems are equipped with resistors to minimize that possibility, but caution should be exercised because operator error is not covered by the warranty.

The U.S. Labor Department's Mining Safety and Health Administration recommends installing cameras to eliminate blind spots. In 1998, the agency began pushing to make rear, side and front cameras mandatory. The effort lost momentum, however, after the departure of Assistant Secretary J. Davitt McAteer.

National Stone, Sand & Gravel Association members resisted the proposal, saying the cameras were unnecessary and too expensive. At the time, the cost would have added as much as \$30,000 for a fleet of 10 haul trucks. And, a regulation would have opened the door for citations and maintenance costs.

Camera and monitor economies have since improved. In addition to cost savings associated with injury and property damage, users are find-

ing that the equipment may reduce insurance costs.

"Ultimately it will have a positive effect on your insurance," says R & R Insurance Account Executive Brad Stehno. Although he knows of no specific credits for installing cameras, they can be used as a negotiation tool during the evaluation phase. Fewer accidents always result in lower premiums, and backing accidents are the most common for every vehicle, Stehno says.

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