Seeing is Believing

The ANSI/ISEA 107-1999 standard offers increased visibility to transportation workers, who are often at risk.

by Ann E. Weaver

Department of transportation employees face the hazards of working in a roadway environment, some of which can be fatal. According to the Louisiana Department of Transportation and Development (DOTD), an estimated 700 to 800 American highway workers and motorists die each year in work zone crashes.

The threat of being hit by a car is a constant danger for those who work near passing motorists. This risk increases at dawn, at dusk, or in inclement weather, when the visibility of these workers is often compromised. While high-visibility safety apparel offers a solution, employers face many options when choosing garments with retroreflective material. With the variety of options available, it becomes difficult for employers to choose appropriate clothing for their employees.

Fred Rasmussen, safety administrator for the Louisiana DOTD, has placed a high importance on obtaining high-visibility garments for his employees. Thanks to Rasmussen's efforts, Louisiana became the first state DOT in the nation to purchase safety vests that comply with ANSI/ISEA 107-1999.

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The American National Standards Institute approved ANSI/ISEA 107-1999, the *American National Standard for High-Visibility Safety Apparel*, in June 1999. The standard represents an important step toward standardizing high visibility safety garments in the United States.

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ANSI/ISEA 107-1999 is a voluntary standard that provides uniform, authoritative guidelines for the selection and use of high-visibility apparel within the United States. It offers performance specifications for background and reflective materials, minimum amounts of these materials, and recommendations for reflective material placement, as well as requirements on test methods and care labeling. ANSI/ISEA 107-1999 represents what the industry and users view as necessary to adequately protect workers from the hazards associated with low visibility.

Rasmussen understands the importance of the ANSI standard and the need for highway workers to be visible in all conditions. Louisiana DOTD statistics illustrate the gravity of the situation: An average of two people die in work zone crashes each day in the United States, including highway workers and motorists. In Louisiana alone, 10 motorists die and 500 are injured in avoidable work zone crashes each year.

Although worker safety has always been a priority for Rasmussen, not until he saw a visibility demonstration did he realize the noticeable difference an ANSI-compliant garment can make. The demonstration allowed Rasmussen to compare his department's current vests with the ANSI-compliant vests under both low-light and nighttime conditions. For him, the importance of 360-degree visibility was clearly evident. "Our old vests had an eight-inch piece of elastic on each side, so when the worker turned sideways he was no longer visible," Rasmussen explained. "The ANSI-compliant vest assures the worker is visible from all angles."

Once Rasmussen made his decision to incorporate the ANSI standard, the adoption process was not an easy one. "It was a six-month to a year-long process," noted Rasmussen. "I worked with a number of different parties to obtain the necessary approvals and develop new safety vest specifications."

First, Rasmussen worked with the DOTD Safety Advisory Committee to obtain the necessary approvals. The next step required him to redraft the specifications. He worked with several different sources to finalize these specifications, including vendors. "I needed to ensure that the manufacturers could bid on the specifications without any problems," he said.After the specifications were finalized, he solicited bids and began a lengthy decision-making process. Several factors contributed to Rasmussen's vest choice.

"My number one priority was to improve employee visibility," Rasmussen said. "With that comes meeting the national ANSI standards."

Answers about Garment Classes
ANSI/ISEA 107-1999 specifies three garment classes that are differentiated by the amount of background material and reflective material that each specifies.

Employers should select an appropriate garment class based on their work environments. Class III is intended to offer the greatest visibility to wearers who work in high-risk environments. Class II garments provide superior visibility for wearers and are more conspicuous than Class I garments. Typically, Class I and II garments are safety vests. Class III garments provide coverage to arms and legs, as well as the torso. Examples are pants with a safety vest (Class E designation), jackets, coveralls, or rainwear.

Janice Comer Bradley, CSP, technical director for the International Safety Equipment Association, has received many questions about the requirements for each class of garment. Her answers are included in a new ISEA brochure on the 107 standard. Regarding Class III garments, Bradley said, "It was never the intention of the standard that the requirements for Class III garments could be met by a vest alone. Class III garments are for workers who face serious hazards and often have high-risk loads that require attention away from the work environment. Garments for these workers should provide enhanced visibility to more of the body, such as the arms and legs."

Using the ISEA specifications as guidelines, Rasmussen stresses that it is employers' responsibility to provide their employees with the most suitable high-visibility safety

garments for their work environment. Employers should use risk assessment, work conditions, personal protection, and comfort as factors when evaluating and selecting an appropriate garment class. Employers can consult a safety expert to conduct a risk assessment, or they may choose to hold an on-site visibility demonstration that allows them to compare their current garments to ANSI/ISEA 107-1999 garment designs. These visibility demonstrations are an effective way to illustrate the impact of an ANSI-compliant garment. The result of this demonstration will help employers determine the appropriate garment class for their employees.

In addition to meeting ANSI/ISEA 107-1999, Rasmussen considered workers' comfort and sought out garments that were sized to fit each employee. Proper fit is essential to reducing hazards in environments where excess material is often considered a work hazard.

Important Selection Issues

However, Rasmussen quickly learned that sizing brought a new set of considerations to ANSI/ISEA 107-1999 compliance. Each of the three garment classes specifies minimum amounts of background and reflective material. Because the area of a particular garment is determined by the type of garment and the size of the wearer, smaller sizes often require different designs to meet ANSI/ISEA 107-1999.

Currently, employers may consider a different garment style to accommodate smaller employees. For example, a sleeveless Class II garment may be used for employees wearing sizes other than "small." But workers wearing smaller sizes may need to be provided a "half-sleeve" or "full-sleeve" garment to accommodate the requirement for the minimum quantity of fluorescent background material that is specified for a Class II garment.

Vest color was also a key consideration. Six years ago, Louisiana became the first state to adopt lime green safety vests. "In a work zone setting, employees in orange vests blend right in with the cones and equipment," Rasmussen explained. "A lime green vest sets the worker apart from his surroundings."

Reflectivity and durability also were important. "I wanted the best reflectivity our money could buy," he said.

A final factor was price. According to Rasmussen, the ANSI-compliant vests cost the department between $8 and $9 more per vest than the garments DOT previously used. He feels this extra cost is justified. "The committee and I agree that the importance of worker safety overrules any extra cost," he said.

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Rasmussen's efforts to adopt ANSI/ISEA 107-1999 were successful; his employees are now outfitted in ANSI-compliant safety vests. But his work

is far from done. His next project is to write specifications for and purchase rainwear that also meets ANSI/ISEA 107-1999. "I'm going through the same processes we used to purchase the safety vests," he said. "If things go as planned, sometime early in 2001 my employees will have lime green rain suits with silver reflective material that meets ANSI/ISEA 107-1999."

Besides reflectivity, Rasmussen is seeking a breathable, lightweight garment that can deflect wind. "In the past we've had PVC orange rain suits; they're very warm," he said. His other complaint about these old suits is that a rip in the material is nearly impossible to repair.

Not only will these garments be used as rainwear, but they also can be substituted for the vest to achieve the same degree of visibility. "This rainwear will be a windbreaker, too," he explained. "It's a warmer alternative that still meets high-visibility requirements."

Other States to Follow

While Louisiana was the first state DOT to adopt the ANSI standard, Rasmussen expects others to follow in his footsteps. Louisiana DOTD already has shared its specifications with other states for both lime green color and reflectivity.

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As he learned, many considerations affect an employer's decision about workers' garments. The following four steps provide a starting point to selecting an appropriate ANSI/ISEA 107-1999 high-visibility safety garment:

1. Conduct a risk assessment of the worker environment.

2. Select the appropriate garment type and class. The standard provides an appendix of design examples, but compliant designs are not limited to these types. View at least two design placement options in a visibility demonstration to narrow down a choice.

3. Specify that the garment must meet ANSI/ISEA 107-1999 performance.

4. Select a garment manufacturer who will use certified background and retroreflective materials, use design guidelines to meet the appropriate garment class, and label the garment per ANSI/ISEA 107-1999.

For other states working to obtain ANSI-compliant safety vests for their workers, Rasmussen has this advice: "Stay the course. If it's right for your employees, get it done no matter what it takes because those employees are your most valuable assets; they make up your department."

Ann E. Weaver is a technical service supervisor for 3M Personal Safety Products, the manufacturer of 3M™ Scotchlite™ Reflective Material. Through her work at 3M, Weaver has become a knowledgeable resource on ANSI/ISEA 107-1999. Copies of this standard

can be purchased from ISEA by visiting www.safetycentral.org/isea/order.html or calling 703-525-1695.