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Protection Update

is the newsletter for the ISEA Partnership for Worker Protection program. It is intended for anyone who specifies, purchases or uses personal protective equipment, and those who regulate it. *Protection Update* is published and distributed without charge, and also is available on ISEA's website www.safetysystem.org.

1901 North Moore Street
Arlington, VA
22209-1762 USA
Telephone: (703) 525-1695
Fax: (703) 528-2148
Email: isea@safetysystem.org

Daniel K. Shipp, President
dshipp@safetysystem.org

Joseph L. Walker, Editor
jwalker@safetysystem.org



ISEA
INTERNATIONAL
SAFETY EQUIPMENT
ASSOCIATION

Calculating Total Fall Distance

The Often-overlooked Component of a Complete Personal Fall-arrest System

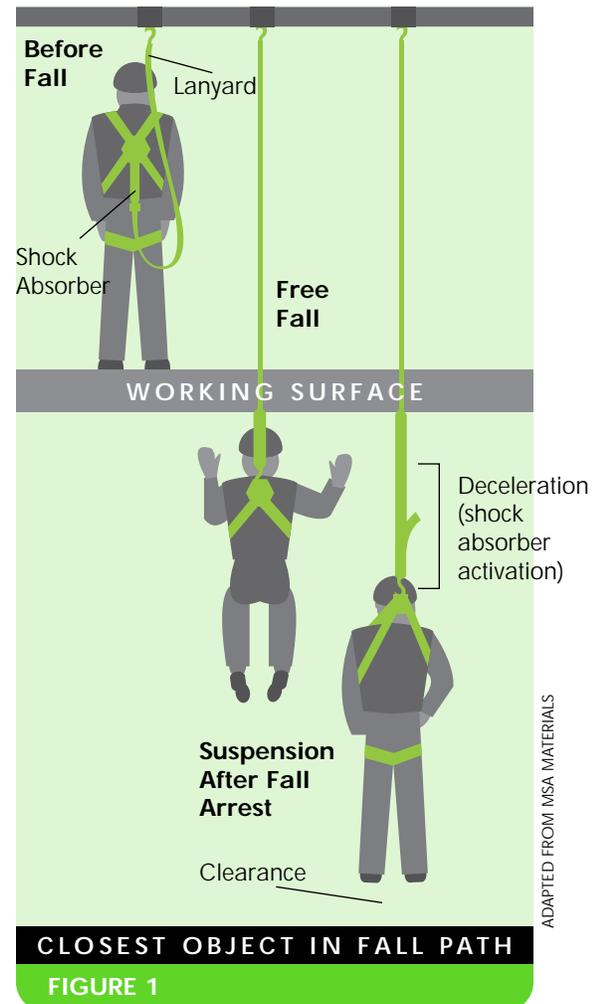
By Robert Apel
Mine Safety Appliances Co.

You just received your new full body harness, 6-foot shock-absorbing lanyard, and anchorage connector. You had a structural engineer qualify all of your anchor points to ensure that they met the strength requirements per OSHA regulations. Now your personal fall-arrest system is complete, right? Wrong. If you have not determined the available clearance below the working surface and calculated your total fall distance (TFD) properly, it still may be possible to be seriously or fatally injured from your fall.

Knowing how to calculate TFD is just as important as selecting the proper harness, lanyard, anchorage connector and anchorage point for the specific task to be performed. Total fall distance (TFD) is defined as the sum of freefall distance (FFD), deceleration distance (DD), harness effects (HEFF), and vertical elongation (VEL). It is also wise to include a safety factor (SF) of at least one

OSHA Rule Prompts Focus on Fall Protection

With a new OSHA rule designed to protect ironworkers against falls now in effect, this issue of *Protection Update* features three in-depth articles about how construction companies can maximize their fall-protection programs for workers at height. OSHA believes that the Steel Erection Rule, which took effect January 18 and with full enforcement to begin March 19, will prevent some 30 fatalities and 1,100 injuries annually. The rule may be downloaded from www.osha.gov.



foot in the formula. Total Fall Distance can be calculated using the following formula:

$$TFD = FFD + DD + HEFF + VEL + SF$$

Before we can begin to calculate Total Fall Distance, we first need to define the variables in the formula.

● **Freefall Distance (FFD):** The vertical distance a worker travels between the onset of a fall until just prior to the point where ▶ 4

NEW PROTECTION FOR ROAD CONSTRUCTORS

Klein-Lite® fall-arrest and positioning harness



Against Falls...

From **Klein Tools** include:

- **Klein-Lite® construction-grade fall-arrest and positioning harnesses**, which are lightweight, fully adjustable and designed to be comfortable for all-day wear, as well as being competitively priced.
- **Klein® lineman's climbing equipment**, which offers comfort, choice and quality, and includes five body belt styles, positioning straps in five sizes, and five fall-arrest lineman's harnesses in five different styles; Klein body belts are available in full-floating, semi-floating and fixed styles, and all have chrome-tanned leather cushions.
- **Klein-Lite® twin-leg deceleration lanyard**, which is designed for use in 100 percent tie-off fall-arrest systems; the lanyard is engineered to allow one lanyard leg to always be connected to an anchorage point while a working position is changed.

For more information about Klein Tools fall-arrest equipment, call 800-553-4676, or fax: 800-553-4857, or visit www.kleintools.com.

From **Daloz Fall Protection** include:

- **The Miller® cable anchorage connector**, which allows workers to attach to an I-beam or similar structure capable of withstanding 5,000 pounds; this connector is available in two models, one with a captive-eye carabiner while the second provides a locking snap hook.
- **The Miller® disposable concrete anchor strap**, which provides a secure, temporary point of attachment for anchorage on concrete forms. The anchor strap loop is positioned on the rebar and concrete is poured over the loop and an adjoining protective nylon sleeve to hold the strap securely in place. Once the concrete sets, a safe anchorage exists; when the anchorage is no longer needed, workers simply cut and discard the protruding strap.



Image from Miller Confined Space Systems Video

- The **Miller® Bandit™ lanyard tool holder** and **WristBandit tool holder**, which offer workers safe and comfortable methods of holding onto tools while at heights, thereby also preventing possible injuries to workers below. The lanyard tool holder attaches to the worker's waist belt; the WristBandit holder attaches to the worker's wrist using Velcro®.
 - The **Miller Confined Space Systems video**, a 20-minute program that focuses on the proper product selection and use of confined space equipment, including detailed instructions in the use of tripods, retrieval units, quad pods, davit systems and accessories.
- For more information about Miller fall protection products, call 800-873-5242, or 814-432-2118, or fax 800-892-4078 or 814-432-2415, or visit www.cdalloz.com

From **DBI/SALA** is a **Self Retracting Lifeline (SRL)** for use in high heat and other harsh or abrasive environments; the SRL features a lightweight but rugged heavy-duty anodized cast aluminum housing, stainless steel working components and 11 feet of galvanized or stainless steel cable to provide maximum durability. For more information, call 800-328-6146 or visit www.salagroup.com. **DBI/SALA Self Retracting Lifeline**



For the Head, Face and Eyes...

From **Hornell, Inc.** is the **Speedglas® ProTop combination hardhat, welding helmet and auto-darkening lens system**, which is especially designed for welders working in areas with overhead hazards, such as cranes, protruding beams and moving machinery; the welding helmet nests into the hardhat when raised, providing balance and comfort. For more information, call 800-628-9218 or 330-425-8880, or fax 330-425-4576, email info.us@hornell.com, or visit www.hornell.com.

Hornell Speedglas® ProTop



From **H.L. Bouton Co.** are **one- and four-ounce bottles of eyewash** to complement Lavoptik's current product line; the eyewash solution contains two natural phosphate buffers and no eye irritants, providing the optimum environment for the eye to heal itself, and the bottles are safety-sealed and dated for freshness. For more information, call 508-295-3300, or email mmurphy@hlbouton.com.

From **Dalloz Safety** is the **Willson® full brim hardhat**, specially designed to offer greater protection against sun and rain, and the **"Sport" protective eyewear**, which is the newest model in the Willson® Millennia™ eyewear line. The new hardhat features two suspension styles, both of which offer versatility and easy adjustment. The "Sport" eyewear features dynamic styling, ultra-lightweight frames, and an integrated lens with "perfect" optics. For more information call 800-345-4112, or fax 610-371-7874, or visit www.cdalloz.com.



Willson® full brim hardhat

For Hearing and Breathing...

From **3M Company**, include:

- **Model 1427 three-position earmuffs** that provide outstanding performance and versatility in high-noise environments; they feature a 360-degree rotating headband that can be worn over or behind the head (providing 27dB noise-reduction rating) or under the chin (26dB noise-reduction rating).



3M three-position earmuffs

- **Model 1425 earmuff** is a lightweight, economical muff that has a low-profile design and provides a noise-reduction rating of 22dB; it features foam-filled cushions that fit comfortably yet securely over the ears, adjustable swivel cups to enhance comfort and fit, and a sliding headband for easy fitting to a wide range of head sizes.

- **Air-Mate™ combination escape self-contained breathing apparatus (ESCBA)/supplied air respirator (SAR)**; this NIOSH-approved system offers a high level of respiratory protection for environments that are immediately dangerous to life and health. Interchangeable five- and 15-minute cylinders allow for flexibility.

- A guide to **Air-Mate™ self-contained breathing apparatuses (SCBAs)**; this four-color brochure details specifications and ordering information on the complete product line and reviews donning procedures and appropriate applications.

For more information on 3M hearing and respiratory protection, call 800-328-1667, email occsafety@mmm.com, or visit www.3M.com/occsafety.

For the Hands and Body...

From **DuPont** include:

- **Work gloves featuring KEVLAR® armor technology**, which addresses the needs of workers whose jobs expose them to extremely hazardous conditions that demand increased protection from sharp objects such as stationary blades, slitting operations or tasks involving heavy metal or glass panels and extremely sharp knives or instruments. For more information, call Gary Burnett, 804-383-3845 or email gary.m.burnett@usa.dupont.com. ▶ 10



DuPont KEVLAR® work gloves.



3M Air-Mate™ combination escape self-contained breathing apparatus

TOTAL FALL DISTANCE

from page 1

the fall-arrest system begins to arrest the fall. Federal OSHA limits this distance to 6 feet or less. To keep FFD to a minimum, you should always try to keep your anchor point as far above the back D-ring of the harness as possible.

- **Deceleration Distance (DD):** The vertical distance a worker travels between the activation of the fall arrest system and final fall arrest. Federal OSHA limits this distance to 3.5 feet or less. The DD that each shock-absorbing fall-arrest device will permit is typically stated on the product label.

- **Harness Effects (HEFF):** The stretch of a harness during fall arrest. This is typically one foot or less for a properly fitted harness. However, some harnesses use elastic-type webbing that can increase the harness effects to two feet or more.

- **Vertical Elongation (VEL):** The stretch in the lifeline of the personal fall-arrest system. Vertical elongation is measured on the part of the lifeline that is under tension during deceleration and final fall arrest. This variable will change drastically depending upon the type of fall-arrest system you are using. For example, most shock-absorbing lanyards are designed to have a maximum deceleration distance of 3.5 feet, which includes the vertical elongation of the lanyard. However, if you are using a rope grab system or a horizontal lifeline, vertical elongation must be calculated based on the stretch of the vertical or horizontal lifelines in those systems. You will need to check the specific manufacturer's product for exact stretch percentages.

- **Safety Factor (SF):** An additional factor of safety to ensure that you have the required clearance below your working surface. This variable should be at least one foot, but can reflect any number with which you feel comfortable.

For illustration purposes, we will use the following equipment:

- Full body harness (non-elastic)
- 6-foot shock-absorbing lanyard
- Fixed, rigid anchorage connector (such as a D-plate bolted to a structural I-beam)

In Figure 1, we see a worker with a 6-foot shock-absorbing lanyard on an elevated platform. In this example, let's assume that his attachment point is 2 feet above the back D-ring of the harness. For every 1 foot the lanyard attachment point is above the harness back D-ring, 1 foot is deducted from the freefall distance (FFD). For every 1 foot that the lanyard attachment point is below the harness back D-ring, 1 foot is added to the FFD (see Table 1). In this scenario, if the worker falls, the FFD will equal 4 feet since the lanyard attachment point is 2 feet above the back D-ring of the harness. So, our formula now looks like this:

$$TFD = 4' + DD + HEFF + VEL + SF$$

The next variable to consider is deceleration distance (DD). Federal OSHA requires that this distance not exceed 3.5 feet. Since all manufacturers' products are slightly different, you should read the label on the product you intend to use to determine the maximum deceleration distance of that product. When calculating total fall distance, the maximum DD that a product will permit should always be used. In our example, the maximum DD would be 3.5 feet.

$$TFD = 4' + 3.5' + HEFF + VEL + SF$$

The harness effects variable is relatively constant at less than one foot. This will vary slightly due to the adjustment of the harness, so we generally use one foot to account for these slight differences.

However, elastic-type harnesses can have more than one foot of stretch, possibly two feet or more, and that additional distance must be accounted for in your calculation. In our example, we are using a non-elastic harness to keep our total fall distance to a minimum.

$$TFD = 4' + 3.5' + 1' + VEL + SF$$

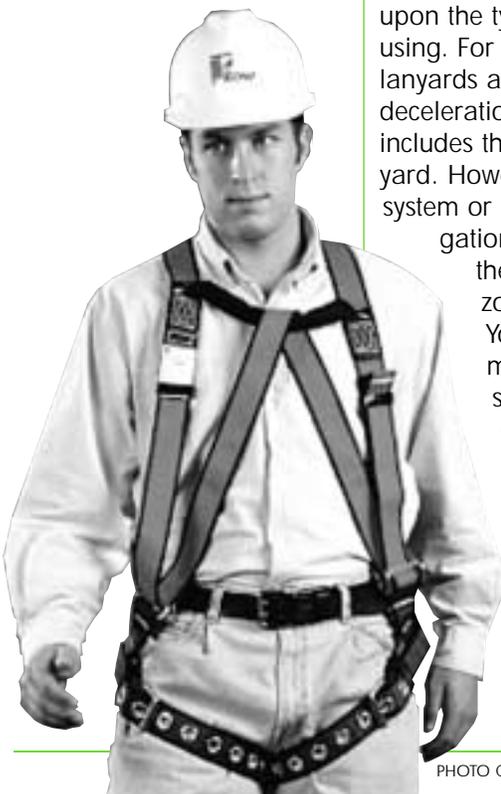


PHOTO COURTESY OF MSA

FREE FALL DISTANCE FOR VARIOUS SHOCK ABSORBING LANYARDS

Distance of Anchorage Connection Point Above (+) or Below (-) Harness Fall Arrest D-ring	LENGTH OF SHOCK-ABSORBING LANYARD			
	6'	5'	4'	3'
+3	3	2	1	0
+2	4	3	2	1
+1	5	4	3	2
0	6	5	4	3
-1	7	6	5	4
-2	8	7	6	5
-3	9	8	7	6
-4	10	9	8	
-5	11	10		
-6	12			

FREE FALL DISTANCE

Most manufacturers design their shock-absorbing lanyards so that the vertical elongation (VEL) of the lanyard is included in the OSHA mandated 3.5-foot maximum deceleration distance. However, if you are using a rope grab or horizontal lifeline, or if you are attaching to a non-rigid anchorage connector, VEL needs to be calculated based on the specifications of those components in your fall-arrest system. Since we are using a 6-foot shock-absorbing lanyard in our example and the VEL is already considered in the lanyard design, we will enter a "0" for the VEL variable.

$$\text{TFD} = 4' + 3.5' + 1' + 0' + \text{SF}$$

The final variable of the formula is the safety factor (SF). It is always a good idea to include at least a 1-foot SF. However, the SF could reflect any number that makes you comfortable with your calculation.

Now we can solve our total fall distance formula:

$$\begin{aligned}\text{TFD} &= 4' + 3.5' + 1' + 0' + 1' \\ \text{TFD} &= 9.5'\end{aligned}$$

Now we know that if the worker in Figure 1 would happen to fall, his TFD will be 9.5 feet. But what does this number really mean? It means that the clearance between the working surface and the next closest object in the fall path must be at least 9.5 feet. It is important to remember that TFD is not always measured from the working sur-

face to the ground, because sometimes the ground is not the closest object beneath the working platform. If there is any type of obstruction in the fall path of the worker (see Figure 2), your available clearance is measured from the working platform to the top of that obstruction. Sometimes these distances can be very short, and a fall protection means other than a 6-foot shock-absorbing lanyard is necessary.

Total fall distance calculations can become more complex than those demonstrated here. The numbers and variables will change depending upon the type of personal fall-arrest system used. For example, when calculating TFDs for horizontal lifeline systems, you have additional variables to consider, such as cable deflection and the number of people on the system. The important thing to remember is that calculating TFD is just as important as selecting the right product for the job. Forgetting to calculate total fall distance is just as dangerous as forgetting to put on your harness before you begin to perform any work at heights. ●

ABOUT THE AUTHOR

Robert Apel is product line manager, Mine Safety Appliances Co. fall protection. ISEA member MSA, headquartered in Pittsburgh, is a leading manufacturer of fall protection through its Rose Manufacturing Co. subsidiary, based in Englewood, CO. Apel may be contacted at 303-922-6246 or Robert.Apel@MSAnet.com.

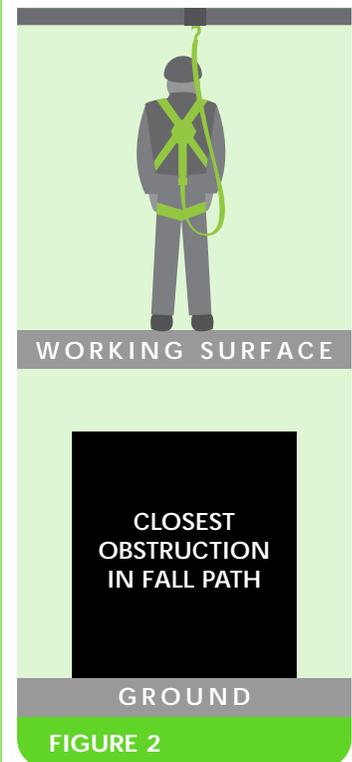


FIGURE 2



PHOTO COURTESY OF DALLOZ

Inspecting and Maintaining Fall-protection Harnesses

By Douglas Mercier
Dalloz Fall Protection

In order to ensure a harness will perform the ultimate function it is intended for – saving a life – it must be inspected prior to every use. Remember that all harnesses have a limited life. However, the length of wearable life will vary greatly depending on the amount of wear it receives, and in what type of environment it is worn. For example, a harness worn only indoors, or only a couple of times in a week, will have a much longer life than one worn outdoors every day. A harness worn outdoors endures a variety of environmental forces and may even show visible signs of damage or corrosion in a matter of months. When inspecting your harness, a good rule of thumb is – when in doubt throw it out.

To maintain service life and high performance, harnesses should be inspected frequently. Visual inspection before each use is required. Regular inspection by a competent person for wear, damage or corrosion should be a part of your safety program. Inspect your equipment daily and replace it if any defective conditions exist. Refer to the manufacturer's guide for detailed instructions and maintenance procedures.

1) Webbing: Grasp the webbing with your hands 6 to 8 inches apart. Bend the webbing in an inverted "U." The surface tension resulting makes damaged fibers or cuts easier to see. Follow this procedure the entire length of the webbing, inspecting both sides of each strap. Watch for frayed edges, broken fibers, pulled stitches, cuts, burns, and chemical damage.

2) D-rings/back pads: Check D-rings for distortion, cracks, breaks, and rough or sharp edges. The D-ring should pivot freely. D-ring back pads should also be inspected for damage.

3) Attachment of buckles: Attachments of buckles and D-rings should be given special

attention. Note any unusual wear, frayed or cut fibers, or distortion of the buckles or D-rings.

4) Tongue/grommets: The tongue receives heavy wear from repeated buckling and unbuckling. Inspect for loose, distorted or broken grommets. Webbing should not have additional punched holes.

5) Tongue buckle: Buckle tongues should be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. Roller should turn freely on frame. Check for distortion or sharp edges.

6) Friction and mating buckles: Inspect the buckle for distortion. The outer bars and center bars must be straight. Pay special attention to corners and attachment points of the center bar.

7) Visual indications of damage to webbing and rope due to various conditions, including:

- Heat — In excessive heat, becomes brittle and has a shriveled brownish appearance. Fibers will break when flexed. Should not be used above 180°F.

- Chemical — Change in color usually appearing as a brownish smear or smudge. Transverse cracks when bent over a mandrel. Loss of elasticity.

- Molten metal or flame — Webbing strands fuse together; hard shiny spots; hard and brittle feel.

- Paint and solvents — Paint that penetrates and dries restricts movement of fibers; drying agents and solvents in some paints cause chemical damage. ●

ABOUT THE AUTHOR

Douglas Mercier is the senior product manager for Dalloz Fall Protection, a Bacou-Dalloz company, leader in manufacturing fall-protection equipment, training and engineered systems. The ISEA member company has been manufacturing fall-protection products for more than 50 years in Franklin, PA. Mercier may be contacted at 814-432-2118 or dmercier@dallozsafety.com.

Can Fall Protection be Made Less Cumbersome?

By Scott Paul
DBI/SALA

The best fall protection is to set up the job site so that workers are not exposed to falls. If that is not possible, you need to start considering your fall protection options. But just providing fall protection is not the answer. If you want workers to actually use the equipment, choose fall protection that provides ease of installation, simplicity, and ease of use for your workers. Most workers will complain, and rightfully so, that their harnesses are difficult to put on and adjust, that the lanyard hooks are difficult to operate, that the anchors are hard to reach and even create fall protection hazards to install.

With the multitude of fall protection companies in industry today, is someone attempting to make fall protection less cumbersome to use? Well there is light at the end of the tunnel. Several of the top fall protection companies are now stepping outside their factories to work at the construction sites with workers to develop these less cumbersome systems.

For many years, manufacturers' representatives have visited job sites to demonstrate the principles of proper fall protection to workers. During these demonstrations, trainers received comments from workers about the difficulty of donning harnesses. That feedback is leading to the development of harnesses that are much easier to don, doff and adjust.

Manufacturers also are developing fall-protection systems specifically designed for workers on bridges. One is a horizontal lifeline system that can be anchored to any concrete beam at the manufacturer, transported on the beam to the bridge site, and put in place as the bridge construction begins. Such systems are easy to install, flexible on site, easy to use, and easy to disassemble when the job is complete.

Of course, these systems and harnesses are not low-end products designed merely to comply with regulations. Typically, they are third-party tested products that have been developed with several prototypes, numerous customer inputs and designed-in fail-safes. The companies that develop these products have R&D staffs, product-development programs, active members on the regulation-development committees, and strong customer service.

To help you in choosing the right fall protection equipment, keep these four basic steps in mind:

- 1)** Assess the hazard: what kind of work are you doing and where is it located? A rooftop, beam, tower or suspended work situation all require very different safety solutions.
- 2)** What will happen if a fall occurs? Think about the structures below you and your fall clearance.
- 3)** Select the appropriate equipment for the job; think about the level of comfort and mobility you need from your equipment and the location of your work.
- 4)** Seek training. When using safety products, even the smallest things make a very big difference. You should be trained in the most effective and quickest ways to make adjustments to a harness, to spot potential problems with equipment, and rectify a bad situation if anything goes wrong. ●

ABOUT THE AUTHOR

Scott Paul is vice president of sales for DBI/SALA, a major manufacturer of fall protection. The Redwing, MN-based company is an ISEA member. Mr. Paul may be contacted at (800) 328-6146 or spaul@dbisala.com.

Members of ISEA's Fall Protection Group

Buckingham Manufacturing Co.

Capital Safety Group (Can-Sling/DBI, DBI/SALA, Protecta International Inc., SES, Sinco Sala)

Daloz Fall Protection

Elk River, Inc.

Klein Tools Inc.

Mine Safety Appliances Co./Rose Manufacturing

North Safety Products

Sellstrom Manufacturing Co.



Work Zone Safety Around the Nation

Minnesota Mandates High-visibility Garments

As of January 1, Minnesota road construction workers became more visible to motorists and work zone equipment drivers. On that date, they had to be given and required to wear high-visibility warning vests or other high-visibility garments defined as being Class 2 or greater as specified by ANSI/ISEA Standard 107-1999.

These new requirements, contained in Minnesota rule "5205.0030 High Visibility Personal Protective Equipment," apply to road workers who are exposed to or working adjacent to moving motor vehicle traffic as part of their assigned jobs.

The rule provides an exception where barricades designed to stop or deflect vehicle traffic upon impact are in place to protect employees. Emergency personnel also are required to wear high-visibility outer garments whenever they are engaged in vehicular traffic control.

Class 2 garments are intended for use by workers who perform tasks that divert their attention from approaching traffic, or that put them in close proximity to passing vehicles traveling at 25 or more miles per hour.

British Report Says Construction Workers Have High Likelihood of Hearing Loss

Construction workers are nearly three times more likely to have serious hearing difficulties than are workers in other industries, according to new research published in Great Britain. The report, *Occupational Exposure to Noise and Hearing Difficulties in Great Britain*, also found that construction

workers do not get the right screening and often do not wear hearing protection.

According to the study, there are more than twice as many people with moderate hearing difficulties in the construction industry than in any other.

The full report is available at www.hse.gov.uk/research/crr_pdf/2001/crr01361.pdf.

ISEA Recommends Regulatory Priorities to Make Construction Safer

The International Safety Equipment Association (ISEA) has asked the U.S. Occupational Safety and Health Administration (OSHA) to focus on several regulatory priorities that will make construction workers safer.

In a recent letter to Administrator John L. Henshaw, ISEA President Dan Shipp urged OSHA to:

- Amend its personal protective equipment (PPE) rule to recognize the hazard of low-visibility conditions, to make the ANSI/ISEA 107 standard for high-visibility apparel part of the PPE rule, and to require high-visibility PPE where needed.
- Expedite pending regulatory actions in respiratory protection, hearing protection, fall protection, confined spaces in construction, and employer payment for PPE.
- Build national consensus on a way to update references to voluntary standards in its regulations when those standards are revised.

For more information, contact Dan Glucksman, ISEA public affairs director, 703-525-1695 or dglucksman@safetys-equipment.org.

National Work Zone Memorial Will Highlight Work Zone Awareness Week

A new traveling memorial to honor the thousands of men, women and children killed in roadway work zones will highlight the observance of the third annual National

Table 5
Relation between hearing abilities* in the left and right ears

Hearing in the right ear	Hearing in the left ear (%)		
	Slight or no difficulty	Moderate difficulty	Serious difficulty or can't hear at all
Slight or no difficulty	3014	100	41
Moderate difficulty	83	178	67
Serious difficulty or can't hear at all	32	18	22
Missing	1011	46	22

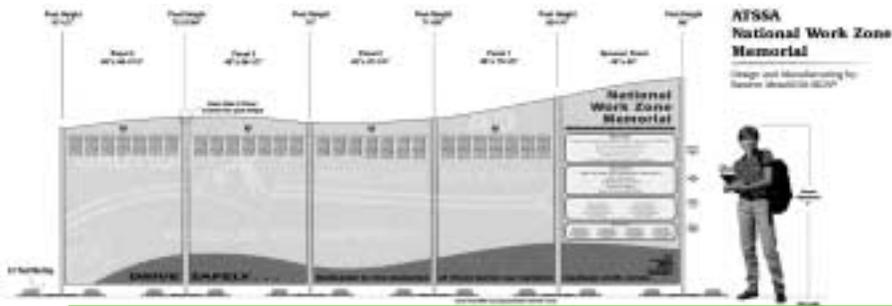
* All data on hearing capabilities were mostly in a questionnaire.

Table 6
The proportion of hearing aid use according to reported hearing capabilities

Hearing in the right ear	Hearing in the left ear (%)		
	Slight or no difficulty	Moderate difficulty	Serious difficulty or can't hear at all
Slight or no difficulty	1180 (39%)	61 (6%)	114 (28%)
Moderate difficulty	1197 (11.2%)	214 (11.2%)	153 (48.6%)
Serious difficulty or can't hear at all	512 (11.7%)	178 (18.9%)	457 (94.2%)
Missing	1044 (10.2%)	108 (10.9%)	117 (10.9%)

* Includes 277 missing data for comparison the proportion of use of a hearing aid.





Work Zone Awareness Week (NWZAW), April 8-12, 2002.

Primary sponsors of the American Traffic Safety Services Association (ATSSA) National Work Zone Memorial include 3M Company and Reflexite Americas, both members of the International Safety Equipment Association as well as ATSSA. After its unveiling during the NWZAW kickoff April 9 in suburban Washington, D.C., the memorial will become available to communities nationwide.

The memorial's centerpiece will be a wall inscribed with the names of road workers, motorists, law enforcement officers and public safety officials killed in work zones. NWZAW is observed to remind motorists to drive cautiously through work zones.

Construction Workers Have Highest Fatality Rate, But Fatal Falls Decrease

Construction has the greatest number of deaths among laborers, according to a recent survey from the Center to Protect Workers Rights. The study showed that 1,226 construction workers were killed on the job in 1999, representing 20.4% of all work-related deaths; construction, however, accounts for about 6% of all jobs.

On a more positive note, the "rate of fatal construction falls decreased during the 1990s from 5.02 events per 100,000 workers in 1990 to 4.17 events per 100,000 workers in 1999," according to a study in the *Journal of Occupational and Environmental Medicine* (Vol. 43, No. 10). And, the U.S. Bureau of Labor Statistics reports that the overall incident rate of occupational injuries and illness in the construction industry has declined 38% over the past two decades.

OSHA recently fined a Boston-area contractor \$60,000 for not training and equipping workers at height on fall protection, citing 29 CFR 1926.501(b)(1) – the Walking Working Surfaces rule.

Construction Violations Lead OSHA's Top 10 List

Lack of proper "Scaffolding – Construction"

and "Fall Protection – Construction" ranked numbers 1 and 2 in the U.S. Occupational Safety and Health Administration's (OSHA's) list of the top 10 standards violated in fiscal 2001, according to *Safety + Health* (December 2001).

The top 10 rankings were based on the most serious citations – those involving "willful," "serious" and "repeat" abuses, the magazine reported.

Other standards related to construction that made the magazine's annual list that emphasizes the most serious violations were Lockout/Tagout, #4; Machine Guarding – General, #5; Respiratory Protection, #6; Powered Industrial Trucks, #9; and Excavations, #10.

2000 Sets Disturbing Record for Work Zone Fatalities

The year 2000 saw 1,093 persons killed in highway work zone accidents, an increase of 225 (26 percent) over 1999 and an all-time record, according to the National Highway Traffic Safety Administration's (NHTSA's) Fatality Analysis Reporting System (FARS) database. The staggering number included at least 163 victims who probably were road construction workers.

"The number of work zones and road workers will continue to increase, and more people will be doing more driving," said Dan Shipp, president of the International Safety Equipment Association.

"Consequently, the number of fatalities is likely to increase unless those of us in the worker protection business redouble our efforts to make work zones safer, including ensuring that workers wear equipment that makes them as visible as possible, round the clock in any kind of weather."

Association of Equipment Manufacturers Launched

The Association of Equipment Manufacturers (AEM) is the name for the newly consolidated Equipment Manufacturers Institute (EMI) and Construction Industry Manufacturers Association (CIMA); AEM officially began operation January 1.

The gathering place for our industry.

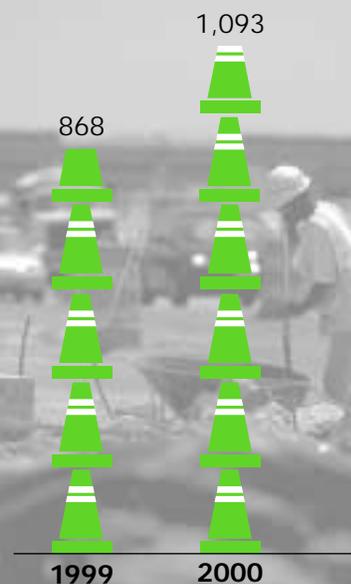
CONEXPO-CON/AGG 2002

March 18-23, 2002 • Las Vegas, USA

Advance registration opens July 2, 2001
www.conexpoconagg.com

Going to the big show? Please visit ISEA at booth GL-3008 in the main lobby.

2000 Work Zone Fatality Report



WHAT'S NEW IN ROAD CONSTRUCTION SAFETY

National Safety Council (NSC) in conjunction with Aon Corporation and Cambridge Integrated Services Group has established a program of **Awards for Outstanding Achievements in Safety & Productivity**. "Many studies show that sound safety programs reduce medical expenses, reduce absenteeism, and lower workers' compensation costs," NSC said. "However, there are very few published documents that give conclusive evidence of the link between improved safety and higher productivity."

The new initiative will honor safety programs best demonstrating the link between workplace safety and productivity. Winning case studies will receive financial awards and plaques. For more information, contact Kajsa Johnson, 630-775-2326 or johnsonk@nsc.org.

American Road & Transportation Builders Association and National Safety Council have introduced an **OSHA 10-hour Training Program and Train the Trainer Seminar** for the roadway construction industry. This package meets OSHA's requirements for 10-hour accreditation and includes a detailed instructor manual and interactive student activities; a CD-ROM containing photos, video clips, dia-

grams and text in Power Point format, and a student guide matched to the instructor manual. The program addresses 11 key construction work zone-related topics, including personal protective equipment. For more information, call Tom Kirby at 888-821-9653, ext. 161, or visit www.artba.org.

Associated General Contractors (AGC) has released its **2001-2002 Publications and Video Directory**, which features more than 400 different products covering a wide range of topics pertinent to the construction industry, including more than 50 new or updated construction learning tools. More than 100 of the items in the 42-page catalog concern safety, and many of those touch on equipping workers with the proper personal protective equipment. For a copy, call 800-AGC-1767 or visit www.agc.org.

Process Safety Management, a new CD-ROM released by the American Society of Safety Engineers, can help companies subject to the requirements of the U.S. OSHA Process Safety Management Standard to lower training costs while ensuring uniform, verifiable employee training. More information is available by calling 847-699-2929 or visit www.asse.org under publications and standards. ●

NEW PROTECTION

from page 3

- **Garments made with a more breathable Tyvek® fabric** to provide greater comfort for reduced heat stress to workers who must wear protective apparel in hazardous job situations; DuPont says the new garments can protect workers against hazardous particles as small as 0.5 microns in size, including silica dust, bacteria and other harmful agents. For more information, call 877-797-5907, fax 800-558-9329 or visit www.tyvekcomfortzone.com.

From **Marigold Industrial** is the **IronGrip MIG300 textured natural-rubber coated glove**, which provides a strong,

safe grip, protects against minor cuts and abrasion and resists liquid penetration; the seamless shell proves a snug, non-irritating fit and enhances worker comfort. For more information, call 800-786-4564 or visit www.marigoldindustrial.com.

From **North Safety** are industrial-weight **Chemsoft™ nitrile gloves**, which the company says are stretchier than other leading industrial-weight nitrile gloves; they provide comfort and dexterity with excellent resistance to cuts, snags, abrasion, fats, oils, greases, hydraulic fluid and most chemicals; they are free of latex proteins and shaped for a natural fit. For more information, call 800-430-4110 or fax 800-572-6346 or visit www.northsafety.com. ●

Marigold IronGrip MIG300 rubber coated work glove



Readership Survey

As *Protection Update* enters its second year, it remains a work in progress with our goal being to provide readers with information that helps them prevent construction worker injuries and fatalities. We value your feedback. **To help us improve our publication, please take a few minutes to complete this survey and return it to Editor Joe Walker, fax: 703-528-2148. Thank you.**

● **Which category best describes your job or organization? (Check only one circle.)**

- Safety Supervisor
 Construction Supervisor with Safety Accountability
 Labor
 State/Federal Official
 Municipal/County Official
 Insurance Underwriter
 Trade Press
 Association
 PPE Manufacturer/Distributor

● **Who in your organization makes personal protective equipment buying decisions? (Mark "1" for the function with primary responsibility, "2" for the function with secondary responsibility.)**

- Safety Supervisor
 Construction Supervisor with Safety Accountability
 Purchasing Agent
 Senior Management
 Other (please identify) _____

● **On a scale of 1-5 (1 of little value, 5 extremely valuable), please evaluate the various articles and columns that regularly appear in *Protection Update*.**

In-depth PPE guidance:*	1	2	3	4	5
New Protection for Road Constructors/What's New in Road Construction Safety	1	2	3	4	5
Work Zone Safety Around the Nation	1	2	3	4	5
Bottom-line Benefit of PPE (Does not appear in this issue)	1	2	3	4	5
Safety Equipment Works for You	1	2	3	4	5

*For example, "Calculating Total Fall Distance: The Often-overlooked Component of a Complete Personal Fall-arrest System," which appears in this issue.

● **How has *Protection Update* helped you improve worker safety or, if not, why?**

● **Are there any types of PPE news you would like to see more or less of in *Protection Update*?**

● **Is there anyone else in your organization who should receive *Protection Update* directly? (If so, please provide mailing or emailing information).**

● ***Protection Update* is being published five to six times a year. Is this frequency:**

- About right
 Too often
 Not often enough

● **In terms of appearance, I give *Protection Update* a (Rate from 5 for excellent to 1 for poor): _____**

● **If *Protection Update* carried advertising, I would be interested in**

- reading the ads,
 buying advertising space, or
 both

● **If you currently receive *Protection Update* via regular mail, would you prefer to receive it by email?**

- Yes (If yes, please provide your email address below.)
 No

● **Other comments? (Use additional pages if necessary)**

● **Optional:**

Your Name _____
 Organization _____
 Phone Number _____
 Email Address _____

SAFETY EQUIPMENT Works for You

Striking Examples of Worker Protection



Louise was working at her Rhode Island construction site when she was struck by a piece of iron scaffolding that had fallen 36 feet. It smashed into her hardhat, knocked her to the ground, fractured her temple and sinus bones, and crushed the bone around her right eye. The blow exceeded the helmet's design limits, but miraculously it did not even knock her out. (Hardhat from Mine Safety Appliances Co., www.msanet.com)



Jack was riding his motorcycle to work when a minivan made an unexpected left turn in front of him. Jack hit the side of the van's door with his bike, sustaining injuries to the left side of his body and face, including a broken nose. Glass flew when the van window shattered. "The only reason I can still see out of both eyes is because I had my safety glasses on," Jack said. "You saved my eyes and God saved my life." (Safety glasses by Uvex, www.uvex.com)



Patrick and Maxie comprise a team that keeps Chicago streets clean by picking up litter and hand sweeping with brooms. Recently, the city equipped them with new high-visibility garments. They report that drivers seem to see them sooner and keep their vehicles farther away than before. They also said that while they usually work some distance apart, they can often make out their partners' high-visibility garments and, therefore, feel less isolated on the streets. (Garments from Head Lites Corp., www.headlitescorp.com)



Jim was working at a construction site when an 8-by-8-by-16-inch concrete block fell 12 feet from an overhead scaffold. The block struck his head and right arm and he was knocked to the ground. Although dizzy and bruised, he returned to work the same day. If not wearing his hardhat, he most likely would have been killed. (Hardhat from Mine Safety Appliances Co., www.msanet.com)

ISEA
INTERNATIONAL
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ASSOCIATION

1901 North Moore Street
Arlington, VA
22209-1762 USA



Protection Update is also available on the National Work Zone Safety Information Clearinghouse website at wzsafety.tamu.edu