OSHA CODIFIED THE CONFINED SPACES IN CONSTRUCTION standard in 2015 with the intention of preventing an estimated 780 serious injuries and five fatalities annually. The need to advance awareness of the new construction industry standard prompted OSHA to award the Rutgers School of Public Health (SPH) a Susan Harwood grant to develop and deliver construction confined spaces training for workers and managers, which also included many trainers in New Jersey and New York. Of 168 training participants, 81% had site safety and health compliance oversight responsibilities, and about half (49%) provided injury and illness prevention training. The goal of the program was to increase participant knowledge and understanding of hazards associated with confined spaces and permit-required confined spaces to assist managers, employers and trainers in developing their own downstream workshops. Trainee feedback during the courses and in succeeding follow-up interactions and surveys was vital to help identify issues that could impede the development of effective training programs.

KEY TAKEAWAYS

- Rutgers School of Public Health developed a construction industry confined spaces training intended to increase worker awareness and help employers educate and train their workforces in changes to corresponding OSHA standards.
- Subsequently, many participants were able to effectively integrate materials received into their downstream training. Site-specific hazard scenarios and other training strategies helped engage trainees in the learning process.

Background

Various industry-specific standards exist to help control and lessen risk. After development, promulgation and review, on May 1, 2015, OSHA released the final rule on confined spaces in construction, 29 CFR 1926 Subpart AA, with requirements applicable to construction activities.

The construction confined spaces standard requires communication and sharing of information between controlling contractors (controlling employers), host employers, entrant employer’s competent persons, and other employers that may be exposed to or create hazards on sites or in facilities where a confined space may devolve into a permit-required confined space (OSHA, 2001).

OSHA defines confined spaces as large enough for workers to enter and perform tasks, limited or restricted means of entry, and not designed for continuous worker occupancy. Examples of confined spaces on construction sites include crawl spaces, tanks and vaults (OSHA, 2015a, n.d.a).

Some differences set the confined spaces in construction standard apart from permit-required confined spaces in the general industry standard:

1. At risk construction sites must have a “competent person” capable of identifying hazards in the workplace and having the authority to abate them immediately and communicate with a host employer or controlling contractor.
2. The construction standard allows for a temporary suspension of the permit as an alternative to cancellation.
3. Construction entry supervisors must be “qualified persons.”
4. The construction standard encourages continuous atmospheric monitoring and requires an early warning system for engulfment hazards (OSHA, 2015b).
5. A professional engineer must design rescue equipment unless manufactured for such use.
Data from Bureau of Labor Statistics (BLS, 2018) show that fatal occupational injuries involving confined spaces increased 15% from 144 in 2016 to 166 in 2017. Since 2012, the number of confined spaces fatalities increased by 89%, and confined spaces fatalities in the construction industry increased by 80%, from 41 in 2012 to 74 in 2017. For example, in 2017, nine fatal occupational injuries involving confined spaces occurred in New York and New Jersey.

Safety training is critical and warranted (Burke et al., 2006; Colligan & Cohen, 2004; Hughes, 2012; Weinstock & Slatin, 2012). Indeed, fatality assessment and control evaluation (FACE) reports cite a lack of training as a major contribut- ing factor in confined spaces fatalities (California FACE Program, 2013; Iowa FACE Program, 2014; NIOSH, 2008, n.d.).

Rutgers developed a 7.5-hour Managing Construction Confined Spaces course as part of this program. Course topics included an introduction to confined spaces, worker rights and responsibilities, a starter kit for a confined spaces training program and developing site-specific checklists. These materials are accessible at http://rutgerstraining.sph.rutgers.edu/harwoodccs.zip (Rutgers SPH, 2017). This article summarizes the training, program evaluations, benefits and pedagogical challenges to training such topics.

**Methods**

Rutgers provided nine sessions of the 7.5-hour Managing Construction Confined Spaces courses to 168 trainees. The participant trainee assessment, in paper-based form, included trainee demographics, baseline knowledge assessment and post-training knowledge retention. Trainees completed a 10-question pre- and posttest. Participants were sent electronic follow-up surveys 3 to 6 months after training yielding data that was then assimilated, managed and analyzed using Microsoft Excel 2016 and IBM SPSS Statistics 25, respectively.

**Outcomes**

Table 1 summarizes trainee demographics. Training participants were mostly male (79%), safety professionals (81%) and under 60 years old (82%). Most (67%) trainees have established careers (i.e., worked in the field for 11 or more years).

Of the 168 training participants, 44% (74) were OSHA outreach trainers. Among these OSHA outreach trainers, 72% (53) were construction trainers, 11% (8) general industry and 18% (13) had both construction and general industry credentials. About 64% (106) of the participants reported working in the public sector. Most of these participants trainees had safety and health responsibilities.

Nearly all (92%) training participants reported that they worked for more than 15 years in business, and more than half (53%) reported their company’s workforce had more than 200 workers. The data also suggests that about 85% (135) of the attendees had knowledge of their company’s confined spaces entry program. Given that 81% were safety professionals, many would be involved in maintaining a confined spaces program. Furthermore, 55% (93) of the participants reported that they anticipated providing future confined spaces training to other workers at their company.

Presumably, after attending the 7.5-hour course, participants subject matter knowledge grew with an average posttest score (92%), nearly twice that of the average pretest score (47%).

Of the 138 follow-up surveys, 22 bounced back as undelivered. Of the 116 delivered surveys, 60 respondents (51.7%) reviewed the survey and 46 (40%) completed it. Studies have documented the typical response rate for online surveys is 10% to 20%; the response rate for this study was within the expected range (Pedersen & Nielsen, 2016). Of the 46 respondents who provided feedback, 31 (67%) acknowledged that they provided construction confined spaces training since completing the Rutgers training.

**Respondent Trainer Feedback**

After participating in the training sessions, many participant trainers presented their own downstream confined spaces training programs. Most respondents reported that they trained between one and 25 students (22, 71%), 16% reported training 26 to 50 students, 3% reported training 76 to 100 students and 10% reported training more than 100 students. These data suggest that participant respondents trained approximately 1,500 workers in their own respective confined spaces train-

---

**TABLE 1**

**TRANEER DEMOGRAPHICS**

<table>
<thead>
<tr>
<th>COMPANY DEMOGRAPHICS</th>
<th>TRANEER DEMOGRAPHICS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sector</strong></td>
<td><strong>Gender</strong></td>
</tr>
<tr>
<td>Public</td>
<td>Male</td>
</tr>
<tr>
<td>106</td>
<td>132</td>
</tr>
<tr>
<td>Private</td>
<td>Female</td>
</tr>
<tr>
<td>60</td>
<td>35</td>
</tr>
<tr>
<td>Did not answer</td>
<td>Did not answer</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td><strong>Age</strong></td>
</tr>
<tr>
<td>Utility</td>
<td>18 to 29</td>
</tr>
<tr>
<td>27</td>
<td>15</td>
</tr>
<tr>
<td>16.1%</td>
<td>8.9%</td>
</tr>
<tr>
<td>Non-utility</td>
<td>30 to 49</td>
</tr>
<tr>
<td>141</td>
<td>65</td>
</tr>
<tr>
<td>83.9%</td>
<td>38.7%</td>
</tr>
<tr>
<td><strong>Size (No. of workers)</strong></td>
<td><strong>Years in the field</strong></td>
</tr>
<tr>
<td>&lt; 25</td>
<td>50 to 59</td>
</tr>
<tr>
<td>25</td>
<td>58</td>
</tr>
<tr>
<td>16.7%</td>
<td>34.5%</td>
</tr>
<tr>
<td>25 to 50</td>
<td>60 to 28</td>
</tr>
<tr>
<td>6</td>
<td>16.7%</td>
</tr>
<tr>
<td>3.6%</td>
<td>1.2%</td>
</tr>
<tr>
<td>50 to 100</td>
<td>16 to 20</td>
</tr>
<tr>
<td>13</td>
<td>22</td>
</tr>
<tr>
<td>7.7%</td>
<td>13.1%</td>
</tr>
<tr>
<td>100 to 200</td>
<td>16 to 20</td>
</tr>
<tr>
<td>30</td>
<td>22</td>
</tr>
<tr>
<td>17.9%</td>
<td>13.1%</td>
</tr>
<tr>
<td>&gt; 200</td>
<td>16 to 20</td>
</tr>
<tr>
<td>87</td>
<td>22</td>
</tr>
<tr>
<td>51.8%</td>
<td>13.1%</td>
</tr>
<tr>
<td>Did not answer</td>
<td>16 to 20</td>
</tr>
<tr>
<td>4</td>
<td>22</td>
</tr>
<tr>
<td>2.4%</td>
<td>13.1%</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td><strong>Safety professional</strong></td>
</tr>
<tr>
<td>&lt; 5</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>136</td>
</tr>
<tr>
<td>3.6%</td>
<td>81.0%</td>
</tr>
<tr>
<td>5 to 10</td>
<td>No</td>
</tr>
<tr>
<td>1</td>
<td>32</td>
</tr>
<tr>
<td>0.6%</td>
<td>19.0%</td>
</tr>
<tr>
<td>10 to 15</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>78</td>
</tr>
<tr>
<td>3.6%</td>
<td>46.4%</td>
</tr>
<tr>
<td>&gt; 15</td>
<td>No</td>
</tr>
<tr>
<td>152</td>
<td>79</td>
</tr>
<tr>
<td>90.5%</td>
<td>47.0%</td>
</tr>
<tr>
<td>Did not answer</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>65.0%</td>
</tr>
<tr>
<td>2.4%</td>
<td>6.5%</td>
</tr>
<tr>
<td><strong>Workers requiring training</strong></td>
<td><strong>Type of course</strong></td>
</tr>
<tr>
<td>1 to 5</td>
<td>Covered as part of outreach</td>
</tr>
<tr>
<td>30</td>
<td>22</td>
</tr>
<tr>
<td>17.9%</td>
<td>13.1%</td>
</tr>
<tr>
<td>5 to 10</td>
<td>Did not answer</td>
</tr>
<tr>
<td>7</td>
<td>104</td>
</tr>
<tr>
<td>4.2%</td>
<td>61.9%</td>
</tr>
<tr>
<td>10 to 15</td>
<td>Anticipate providing training after taking course</td>
</tr>
<tr>
<td>19</td>
<td>Yes</td>
</tr>
<tr>
<td>11.3%</td>
<td>55.4%</td>
</tr>
<tr>
<td>&gt; 15</td>
<td>No</td>
</tr>
<tr>
<td>101</td>
<td>51</td>
</tr>
<tr>
<td>60.1%</td>
<td>30.4%</td>
</tr>
<tr>
<td>Did not answer</td>
<td>11</td>
</tr>
<tr>
<td>11</td>
<td>65.0%</td>
</tr>
<tr>
<td>6.5%</td>
<td>6.5%</td>
</tr>
<tr>
<td><strong>Company provides CS training</strong></td>
<td><strong>Company</strong></td>
</tr>
<tr>
<td>Yes</td>
<td>93</td>
</tr>
<tr>
<td>133</td>
<td>55.4%</td>
</tr>
<tr>
<td>79.2%</td>
<td>51</td>
</tr>
<tr>
<td>No</td>
<td>35</td>
</tr>
<tr>
<td>20.8%</td>
<td>14.3%</td>
</tr>
<tr>
<td>Did not answer</td>
<td>24</td>
</tr>
<tr>
<td>0.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Note. n = 168 participants; CS = confined spaces
ings within the span of some 6 months since having completed
the Rutgers course.

Of the 31 follow-up survey respondents who stated that they
provided construction confined spaces training, 26 (84%) said
they were able to use the materials provided by the course to
enhance their training. The type of training they provided in-
cluded awareness/outreach (1 to 4 hours) or operations level (1
day or longer). Most respondents (21 of 31, 68%) reported that
their construction confined spaces training was 4 hours or less.
The remaining 10 participants reported offering longer training
sessions. Additionally, 13 stated that they enhanced their train-
ing by creating field exercises. Respondents surveyed a relatively
short time after completing the training (within 6 months)
showed short-term gains and challenges.

From the course material, participants who performed
downstream training were able to create handouts, develop
workshop course content and integrate supplemental site-spe-
cific materials. Several survey respondents stated that they were
able to use specific examples from the course to help clarify
construction concepts and situations for their own trainees.
Both trainer and worker participants found group exercises
and consequent discussions beneficial, describing these activ-
ities as “useful,” “engaging” and “insightful.” One respondent
described how group discussions gave the class a better insight
into what workers experienced on a regular basis and alerted
them to potentially overlooked problems.

Pedagogical Challenges & Recommendations for
Training Confined Spaces in the Construction Industry

The development team applied learning strategies and train-
ing tools to their confined spaces course designed to increase
attention and retention, and provide a practical pedagogical
model for downstream trainings for employers and trainers
who wished to train others. Naturally, underlying the devel-
opment of the curriculum and delivery of the coursework, the
team relied heavily on best practice models such as analysis, de-
sign, development, implementation and evaluation (the ADDIE
model; Hidayanto et al., 2017), and ANSI/ASSP Z490.1-2016
Criteria for Accepted Practices in Safety, Health and Environ-
mental Training (Table 2, p. 36). The following pedagogical
approaches may be helpful when training managers and workers.

1. Know Your Audience

To design any course, developers must first know and un-
derstand their audience’s needs, vulnerabilities, interests, ap-
titudes, background and collective commonalities (Ozdilek &
Robeck, 2009). The most basic starting point here was a given
susceptibility that for decades construction personnel did not
have an industry-specific confined spaces standard and had to
borrow from horizontal standards, found in the general indu-
sry, to successfully accomplish permitted entries. Construction
professionals continue to rely on associated general industry
standards such as respiratory protection (29 CFR 1910.134), the
control of hazardous energy through locking out and tagging
out (29 CFR 1910.147) and hazard communication (29 CFR
1910.1200). The team overcame this challenge by providing
regulatory context to trainees on OSHA’s incorporated by ref-
erence standards and discussions of how the OSH Act of 1970’s
General Duty Clause works in practice.

In addition, past experiences demonstrated that managers
and workers devoted disproportionate resources to the most
obvious and more tangible hazards. Intuitively, these hazards
include the OSHA’s “focus four” leading causes of fatalities
(i.e., falls, struck-by, electrical, caught-in-between). Courses
possessing more intangible and science-based content, such
as trainings on the revised Hazard Communication Standard
(Globally Harmonized System), circadian rhythm disturbances
of night-shift workers, and an examination of injury and illness
prevention systems required more teaching as opposed to train-
ing in hazard recognition and standards alone.

2. Create Ownership & Enfranchise Trainees

To help demonstrate how to achieve buy-in and instill a
sense of ownership in the processes of developing a job hazard
analysis, the course instructors had trainees create their own
scenarios with potential hazards and controls (Purvis et al.,
2015; Rutgers SPH, 2017, pp. 49-51). The course emphasized
the importance of ownership benchmarked from research that
suggests people place greater value on potential losses than op-
portunities of equal gain (Kahneman & Tversky, 1979). Hence,
by incorporating and enfranchising workers into any adminis-
trative effort, employers and controlling employers have oppor-
tunities to create value in a multilateral noncoercive manner,
making all stakeholders accountable. Such cooperation also
helps develop more practical procedures that workers can more
easily follow.

3. Competitive Group Exercises

The development team used game-based competitive group
exercises as a learning tool to practice newly acquired terms,
concepts and hazard controls. The exercise was creative, where
each group built a task-hazard-control “straw man” scenario
and worked within the bounds of the game. Game-based learn-
ing tools represent great pedagogical potential (Pho & Din-
score, 2015). The game’s reward system and structure placed
values on identifying and controlling hazards, where advanced
hierarchical controls added more points. In all presented cours-
es, this portion of the class increased engagement and inevita-
ably led to friendly multilateral banter and theoretical parsing
between teams. Evidently, the lightweight banter and laughter
prompted one trainee in a debriefing to state, “This doesn’t feel
like a class, but we learned a lot and used what we learned.”
That trainee was an OSHA outreach authorized trainer, who in
a sidebar conversation months later noted how he applied the
same techniques (OSHA, 2019).

4. Provide Examples of Human
Error Traps & Reduction Techniques

Since the confined spaces in construction standard relies
on written permits that can include checklists, the developers
sought an opportunity to identify an often-ignored occupation-
al hazard with limited means of hazard control: human error.
The curriculum incorporates an exercise in the area of human
performance improvement that provides a working example of a
checklist developed to hedge against “pencil whipping,” whereby
participants tend to hurry through common repetitive paper-

Validating testimony and feedback from trainees was in-
valuable. Anecdotally, during many sessions, trainees would
validate this human tendency by stating they too have seen
instances of pencil-whipped paperwork such as hot work per-
mits and competent person scaffold and excavation checklists.
The human performance improvement model checklist served
several functions:
validates that humans, whether at work, at home or elsewhere tend to make common errors of expediency that could result in injury, illness or death

provides a practical example to help "human proof" their own downstream checklists

introduces trainees to the field of human performance improvement

dispels the notion that people who pencil whip checklists are intentionally trying to cheat or have insubordinate intent but rather fall into common human error traps, and managers and employers should aim to fix the problem not affix blame

5. Strive to Create Understanding

Imparting an understanding of a topic, beyond merely providing knowledge is fundamental to effective occupational training (Wiggins & McTighe, 2005). The difference between knowing and understanding is a timeless argument that analogy perhaps best explains: We may know, for example, with extreme accuracy when a certain tide rises and falls, but not necessarily understand why the tide does so. Training to a deeper, more cognitive level invites an understanding of the interactions of gravitational forces of the moon, the earth and

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Challenges to Effectively Training Construction Confined Spaces Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issue</td>
<td>Challenge</td>
</tr>
<tr>
<td></td>
<td>Resolutions and resources</td>
</tr>
</tbody>
</table>
| Know your audience | • Find commonality in a diversified group.  
|                   | • Assess different needs.                                                |
|             | • Create a common learner profile.                                       |
| Create ownership and enfranchise trainees | • Listening skills of instructors and familiarity with industry  
|                                              | • Analysis, design, development, implementation and evaluation (ADDIE model; Ozdilek & Robeck, 2009) |
|                   | • Benchmarking across disciplines—finance and behavioral economics (Kahneman & Tversky, 1979)  
|                   | • OSHA's Safety Pays program (OSHA, n.d.b)  
|                   | • Purvis et al., 2014  
|                   | • Using multiple training delivery method, where on-the-job training is part of the delivery and a better way to get worker buy-in to the severity of the hazard (ANSI/ASSP Z490.1, E4.4.1) |
| Competitive group exercises | • Confined spaces in construction exercise (Rutgers SPH, 2017, pp. 49-51)  
|                                              | • Hidayanto et al., 2017 |
| Human error traps and reduction techniques | • Checklist exercise (Rutgers SPH, 2017, pp. 46-48)  
|                                              | • U.S. Department of Energy, 2009  
|                                              | • Hallinan, 2010 |
| Strive to create understanding | • Answer the “whys” and the “hows” so a topic makes cognitive sense to the adult learner.  
|                                              | • Allow adult learners to “connect the dots” and find justification for standards and regulations.  
|                                              | • Wiggins & McTighe, 2005 |
| Concurrent feedback and debriefing | • Evaluate, modify and execute training according to constant feedback in real time.  
|                                              | • Encourage and ask questions to assess saturation of information.  
|                                              | • Garvin, 2000  
|                                              | • Observations, audits and inspection data should be used to enhance training design and delivery. Organizational support is needed to incorporate this data into training programs (ANSI/ASSP Z490.1, 6.3.1-6.3.2). |
| Make efficient use of time | • Shaw et al., 2010  
|                                              | • Whitman, 1988 |
| Context and the shared responsibility on multi-employer workplaces | • OSHA’s (1999) multiemployer citation policy  
|                                              | • “Managing the Construction Industry Confined Spaces Program” (Rutgers SPH, 2017, pp. 5-7) |
the sun along with the earth’s rotation and inertia, and beyond. This course sought not merely to recite regulatory requirements and review flowcharts but to examine and explain the dynamic nature of permit-required confined spaces as well as the nature of many of the more common physical and chemical hazards within.

Inevitably any confined spaces training must answer the hows and whys implicit to such regulation. The developers tailored the confined spaces curriculum to explain why algorithmic flowcharts exist, what such terms within the flowcharts mean and how certain invisible hazardous atmospheres can immediately cause death, injury or serious illness.

6. Concurrent Feedback & Debriefing

Throughout each session, instructors encouraged real-time trainee feedback and concurrent facilitation between trainees. In these classes, adult learners often gain valuable information from sharing of experiences with other trainees. Trainers can also gain valuable feedback and evaluate the effectiveness of their techniques by listening and learning from the trainee-centric discussion.

Coincidently, the usefulness and necessity of debriefing as a pedagogical and management tool was reinforced by the applicable construction and general industry standards where language directs entrant employers to “debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations” [29 CFR 1910.146(c)(8)(v)]; 29 CFR 1926.1203(h)(5)(i)]. Trainees who were themselves trainers appeared to appreciate the connectivity between standards pedagogy and administration; several comments in class mentioned that debriefings should take place in other areas of construction activities.

7. Make Efficient Use of Time

Time management is always important but becomes critical when training more complex topics where knowledge transfer is more challenging, especially given a 7.5-hour program. During informal greetings and introductions at the beginning of the day, instructors would attempt to identify more experienced individuals to help share experiences and later act as team leaders in group exercises. In an effort to enrich the program through facilitation of each group’s collective experiences and make more efficient use of time, instructors encouraged more experienced individuals to concurrently share their own stories with less-seasoned trainees. This facilitation occurred during group breakout sessions and throughout the day generally. In a group activity in which each team’s task was to determine responsibilities of host employers, controlling contractors, entry employers and the rescue team for a mock tabletop exercise, the respective team leaders guided their less experienced teammates. Additionally, instructors discouraged team leaders from acting as their team’s spokesperson, allowing others in the group to share their findings to gauge saturation of information.

8. Context & Shared Responsibility in Multiemployer Workplaces

Broadening the situational “big picture” context provided an opportunity for trainees to understand shared roles and responsibilities on multiemployer jobsites. The inclusion of host employers and controlling contractors in the new confined spaces standard gave workers and management alike a sense that OSHA was encouraging a team effort, wanting all stakeholders to work together to protect workers who work in and around permit-required confined spaces. This expanded holistic dichotomy departs from the more common understanding of merely an employer-employee relationship.

A graphic (flowchart of roles and responsibilities) allowed subcontractor participants to see that they were not alone in the protection of their employees, while general contractor participants too realized a need to increase supervisory site-specific training and become more involved at managing subcontractors, to familiarize them with confined spaces programs (Rutgers SPH, 2017, p. 7). A pretraining survey identified this supervisory deficiency. Effective site safety and health management requires training of contractors to develop familiarity with site-specific procedures (Shamsuddin et al., 2015).

By seeing context, all trainees established a consensus that controlling contractors should encourage subcontractors to participate in and share information in their confined spaces and permit-required confined spaces program orientations prior to engaging in confined-spaces-related activities, and multilaterally, subcontractors should open dialogue between controlling contractors and other employers in multiemployer jobsites.

Survey data verified that the flowchart illustrations were helpful for downstream trainings. Several participant trainers were able to use the flowcharts from the training material to demonstrate how the respective standard applies to specific industries and situations.

Limitations

The data presented in this study is from a small sample from one geographic area of the U.S. Data from the initial and follow-up surveys were self-reported and may not reflect every challenge that existed in managing a confined spaces program. The survey did not link pretest and posttest scores with individual identifiers. Thus, further analysis based on trainee characteristics such as experience was not possible. Additionally, survey data did not assess for impact upon trainees in downstream trainings performed by trainer participants.

Conclusions & Recommendations

Permit-required construction confined spaces pose serious risks to worker safety and health at construction sites. Many participants who completed the Rutgers construction confined spaces training were able to use their knowledge and understanding to develop and enhance their own downstream programs and training programs.

Training complicated topics such as the confined spaces in construction standard requires training toward general under-
standings whereby trainees can practice conceptual procedures and understand the whys and hows of a subject area. The Rutgers curriculum is a starting point for employers, managers and trainers to help enfranchise their respective workers into their injury and illness prevention programs and system processes. Several resources and references are available including systems such as the ADDIE model and ANSI/ASSP Z490.1, and review of such programs is both desirable and mandatory. **PSJ**

**References**


Hallinan, J.T. (2010). Why we make mistakes: How we look without seeing, forget things in seconds and are all pretty sure we are way above average. Crown Publishing Group.


NIOSH. (n.d.). 29-year old male Hispanic landscape laborer dies when nine-foot-trench collapses (Michigan FACE Report No. 06MI004), www.cdc.gov/niosh/face/statefac/mi/06mi004.html


Acknowledgments

This project was funded through the OSHA Susan Harwood Program under grant No. SH29649SH6. This article does not necessarily reflect the views or policies of the U.S. Department of Labor, nor does mention of organizations imply endorsement by the U.S. government. The authors express their gratitude to Mehul A. Patel, Megan Rockafellow-Baldoni, Mitchell A. Rosen, and Derek G. Shendell for their assistance in completing this project.

Koshy Koshy, Ph.D., is an assistant professor in the Department of Environmental and Occupational Health and advisor for the OSH concentration at Rutgers School of Public Health School of Public Health. He also manages the Region 2 OSHA Training Institute Education Center at Rutgers SPH. Koshy is a professional member of ASSP’s New Jersey Chapter.

Michael Presutti, B.A., is a course instructor at the Center for Public Health Workforce Development, Region 2 OSHA Training Institute Education Center at Rutgers School of Public Health. He is a risk control consultant with more than 2 decades of experience working in both the public and private sectors of industry.

Michael Presutti, B.A., is a course instructor at the Center for Public Health Workforce Development, Region 2 OSHA Training Institute Education Center at Rutgers School of Public Health. He is a risk control consultant with more than 2 decades of experience working in both the public and private sectors of industry.