

EMERGING WORKPLACE HAZARDS: **Creating Adaptable and Innovative Safety and Health Training**

May 2–4, 2023 / Indianapolis, Indiana



WORKSHOP SESSION SUMMARY

POST-CONFERENCE PROCEEDINGS

1. Session Title and Presenter's Contact Information:

Workshop number and title: 26, 89: A Trainer's Approach to Increase Awareness of Engineered Nanomaterials in Construction

Presenter (s) Name: Gavin West

Presenter Organization: CPWR – The Center for Construction Research and Training

Presenter Email: gwest@cpwr.com

2. Workshop Summary:

During the past two decades, nanotechnology has enabled considerable improvements to materials used in different industry sectors including electronics, construction, packaging, food, energy, healthcare, automotive, and defense. Materials can be nano-engineered to be stronger, lighter, more durable, more reactive, better electrical conductors, and more. The flipside is that engineered nanomaterials can also pose hazards to workers exposed to them on the job.

This session will explore how CPWR uses a train-the-trainer approach, informed by ongoing research, and tailored to specific trades, to make construction workers more aware of the risks posed by engineered nanomaterials and how to prevent exposures. Participants will learn about the technical information, core concepts, and group exercises used in the curriculum, and how to access resources to use in their own courses. A facilitated group discussion and brainstorming activity will focus on challenges and effective approaches when training workers about emerging hazards, like engineered nanomaterials, which may be unfamiliar to the public and not yet fully understood by researchers. Participants will be encouraged to share and reflect on their own experiences.

3. Methods:

The presentation for this workshop was delivered using the Assertion-Evidence Approach, which structures information by presenting concise assertions followed by supporting evidence and visuals. This method has several advantages for trainers. First, it helps us to communicate our messages clearly and effectively. Second, visual aids make the information we present more understandable and engaging for the audience. Third, it enables us to focus on key messages we wish to convey. By providing evidence to support our claims, we can increase the credibility and trustworthiness of our training. Most importantly, this approach helps us to structure and organize information in a way that makes it easier for participants to comprehend and remember the content. One disadvantage of the Assertion-Evidence Approach is that it may not be suitable for all training situations or topics, as it can oversimplify complex subjects and limit

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flexibility in presentation methods. Incorporating effective visual aids into a presentation requires time and effort.

Facilitated group discussions were also used in this workshop. Benefits of this training method are that it promotes active engagement, sharing diverse perspectives, and collaborative learning. Potential challenges include managing time effectively and ensuring equal opportunities for participants to contribute and share their thoughts.

4. Main Points/Key Points Raised from Participants:

What strategies and resources do you use to stay on top of new information and evolving best practices?

Participants said they use a range of strategies and resources to stay updated on new information and evolving best practices. They attend conferences, seminars, and workshops, including this Trainers' Exchange; actively engage with professional networks, subscribe to industry publications, and participate in webinars. These approaches, along with seeking out information from reputable sources, such as OSHA or NIOSH, enable them to continuously enhance their knowledge and ensure their training programs reflect the latest developments in occupational health and safety.

Have you conducted training on emerging issues or topics that are not fully understood? If so, what challenges did you face and how did you try to overcome them? What strategies do you find effective in communicating risks to workers?

Participants had conducted training on emerging issues or topics that were not fully understood or had faced challenges in effectively delivering complex or technical information. To overcome these challenges, they implemented several strategies:

- **Simplified language and terminology:** They recognized the importance of using language and terminology that workers could easily understand. They avoided jargon or technical terms and instead used clear, everyday language to explain concepts and risks.
- **Effective visual aids:** Visual aids played a crucial role in communicating risks to workers. They employed well-designed and easy-to-understand visuals to enhance comprehension. Some noted that the visuals used in this workshop were good examples.
- **Relatable examples:** They found that using relatable examples or real-life scenarios helped workers grasp potential risks more effectively by linking the information to their own experiences.
- **Active participation:** They created an interactive learning environment that encouraged workers to actively participate in discussions, ask questions, and share experiences. This allowed for a better exchange of information and improved comprehension.

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It is important to note that their approach emphasized effective communication without using the phrase "dumb it down," as it can be offensive. Instead, they focused on making technical content more accessible and understandable, respecting the diverse backgrounds and knowledge levels of the workers they trained.

5. References:

- Cooper, M. R., West, G. H., Burrelli, L. G., Dresser, D., Griffin, K. N., Segrave, A. M., Perrenoud, J., & Lippy, B. E. (2017). Inhalation exposure during spray application and subsequent sanding of a wood sealant containing zinc oxide nanoparticles. *Journal of Occupational and Environmental Hygiene*, 14(7), 510-522.
- Garner, J., & Alley, M. (2013). How the design of presentation slides affects audience comprehension: A case for the assertion-evidence approach. *International Journal of Engineering Education*, 29(6), 1564-1579.
- Schulte, P. A., Leso, V., Niang, M., & Iavicoli, I. (2019). Current state of knowledge on the health effects of engineered nanomaterials in workers: a systematic review of human studies and epidemiological investigations. *Scandinavian journal of work, environment & health*, 45(3), 217.
- West, G. H., Castaneda, F. I., Burrelli, L. G., Dresser, D., Cooper, M. R., Brooks, S. B., & Lippy, B. E. (2021). Occupational exposure risk during spraying of biocidal paint containing silver nanoparticles. *Journal of Occupational and Environmental Hygiene*, 18(6), 237-249.
- West, G. H., Cooper, M. R., Burrelli, L. G., Dresser, D., & Lippy, B. E. (2019). Exposure to airborne nano-titanium dioxide during airless spray painting and sanding. *Journal of Occupational and Environmental Hygiene*, 16(3), 218-228.
- West, G. H., Lippy, B. E., Cooper, M. R., Marsick, D., Burrelli, L. G., Griffin, K. N., & Segrave, A. M. (2016). Toward responsible development and effective risk management of nano-enabled products in the US construction industry. *Journal of nanoparticle research*, 18, 1-27.

6. Workshop Handouts/Resources:

- A Trainer's Approach to Increase Awareness of Engineered Nanomaterials in Construction – PPT
- NIOSH Nanotechnology Guidance and Publications: <https://www.cdc.gov/niosh/topics/nanotech/pubs.html>
- OSHA Nanotechnology Topic Page: <https://www.osha.gov/nanotechnology>
- CPWR Construction Nanomaterial inventory: <https://nano.elcosh.org/>
- CPWR Nano Toolbox Talks: <https://www.cpwr.com/research/research-to-practice-r2p/r2p-library/toolbox-talks/>
- CPWR Nanomaterials Hazard Alert Card: <https://www.cpwr.com/research/research-to-practice-r2p/r2p-library/hazard-alert-cards/>