

Construction Safety Research Center (CSRC) Meeting Minutes

Annual Meeting: Thursday, November 10, 2022

Call to Order

Ross Sanders called to order the second annual meeting of the CSRC at 3:05 PM EDT on the Lawrence Tech University (LTU) campus, Building 5, M336.

Opening Statements by Ross Sanders, Director of Industry Partnerships

Welcome and Introduction of Associate Vice President of Economic Development, Mark Brucki, by Ross Sanders

Greetings by Mark Brucki

- The CSRC is honored to have entered its second year, having doubled in members since the inaugural meeting, and is grateful for the organizational support it has received in its establishing year
- Grateful to say that students at LTU receive a unique, hands-on experience created by the industry relationships formed with the university, such as companies who are members of this organization
- There is a great economic impact on the university and the entire area thanks to these relationships as well

Review of Agenda, Ross Sanders

Thanks to Founding Members and Representatives, Special Thanks to Donor Mike Darga

Introduction and Thanks of New Members

- Barton Malow
- MISS DIG 811
- Frank Rewold & Sons
- CAB Engineering

Individual Introduction of Attendees

Introduction of Dr. Ahmed Al-Bayati, CSRC Director by Ross Sanders

Greetings by Dr. Ahmed Al-Bayati

- Members are individually approved to ensure passionate industry leaders are involved
- Fatality rates of construction workers is at an unacceptable rate
- Outdated training and safety materials pose a prominent threat to the health and safety of workers
- Research center members vote to choose research projects to find solutions to current relevant issues

Background and Experience of Dr. Ahmed Al-Bayati CSRC

Structure Overview

LTU Support Body

- Dr. Elin Jensen, Department Support
- Dr. Liping Liu, College Support
- Ross Sanders, Business Outreach
- Gabrielle VanAmberg, Website Management
- Lyubov Kagan, Budget Management
- Matthew Roush, Marketing and PR

2022-2023 CSRC Members

- Barton Malow
- Bouma Corporation
- CAB Engineering
- Carhartt
- City of Southfield
- City of Kalamazoo
- DTE Energy
- Frank Rewold and Sons
- MISS DIG 811

CSRC Mission and Goals presented by Dr. Ahmed Al-Bayati Mission

To lead the way in reducing work-related fatalities and injuries by providing construction firms with innovative safety practices derived from groundbreaking research

Goals

- Conduct Safety Research
- Transform Research to Best Practices
- Convert Best Practices to Training Material

First Year Member Selected Research Topic – Suggested by Carhartt Why

is PPE non-compliance a widespread issue among construction workers?

Literature Review

- Kang et al. (2017) found that 70% of all fall incidents involved a lack of PPE
- Al-Bayati and York (2019) found that 85% of examined fatal fall incidents among Hispanic workers in the United States were associated with not using required PPE
- Construction workers who do not use PPE are 3 times more likely to be injured than those who do

OSHA's Construction Top 10 Violations

1. Duty to have fall protection **(PPE)**
2. Ladders
3. General requirements
4. Training requirements **(Related)**
5. Eye and face protection **(PPE)**
6. Head protection **(PPE)**
7. General safety and health provisions
8. Aerial lifts
9. Specific Excavation Requirements
10. Hazard Communication **(Related)**

PPE Non-compliance Causes

Research carried out by the CSRC and its members reveals 16 factors that contribute to PPE non-compliance, which can be sorted into 4 categories:

- PPE Design Factors
- Safety Climate Factors
- Safety Culture Factors
- Other Factors

Safety Culture Vs. Safety Climate

There are three dimensions of Safety Culture:

- Corporate Safety Culture consists of an organization's official policies, systems, procedures, and workflow.
- Psychological Safety Culture refers to thoughts and feelings about safety.
- Behavioral Safety Culture includes employee activities, behaviors, and actions related to workplace safety.

Safety Culture refers to the actions of upper management and safety teams.

Safety Climate refers to frontline supervisors and worker involvement.

PPE Design Factors - PPE Non-compliance causes

This category centers on shortcomings in the design and fabrication of PPE wear

- Poor quality, fit, and comfort
- Lack of climate adaptation (e.g., workers do not want to wear PPE such as helmets or gloves in hot climates)

Construction Safety Climate Factors - PPE Non-compliance causes

This category includes factors related to the actions of workers and frontline supervisors

- Workers believe that PPE reduces the ability to meet performance deadlines, increases work effort, and increases restrictions
- Inadequate safety supervision and enforcement of safe work practices can cause workers to display a negligent attitude toward PPE use and disregard safety rules
- Peer pressure among workers insinuating that wearing PPE denotes weakness in a worker
- Poor worker perception of the risks they are exposed to when not wearing PPE

Construction Safety Culture Factors - PPE Non-compliance causes

This category includes factors related to the actions of upper management and safety personnel

- Lack of safety training
- Lack of management support
- Lack of safety rules and policies
- Lack of PPE availability and accessibility

Other Factors - PPE Non-compliance causes

This category includes a collection of other factors

- Unstable employment status (e.g., temporary, undocumented, or seasonal employment): some workers, particularly those of Hispanic descent, do not always receive the necessary PPE due to their undocumented or temporary employment status, which forces them to value job security over speaking up about safety issues.
- Somatic health effects: some workers with health conditions cannot wear PPE due to physical and mental stress, especially in confined or poorly ventilated areas.
- Cultural and language barriers: these barriers contribute to higher fatality rates among ethnic minority construction workers (e.g., the Hispanic workforce in the US).

Factor Ranking

The CSRC conducted a national survey of 185 practitioners to rank the importance of the factors within each of the aforementioned four categories

High Importance

- Inadequate Safety Supervision
- Poor Risk Perception
- Lack of Climate Adaptation
- Lack of Safety Training
- Lack of Management Support

High-Moderate Importance

- Poor Quality, Fit, and Comfort
- PPE Increases Restrictions
- Somatic Health Effects

- PPE Increases Work Effort

Moderate Importance

- PPE Increases Work Time
- Performance Pressure

Moderate-Low Importance

- Unstable Employment Status
- Lack of PPE Availability and Accessibility
- Lack of Safety Rules and Regulations

Low Importance

- Cultural and Language Barriers & Peer Pressure

It is important to note that there is a possible bias in the study, as the participants in the study do not represent the Hispanic population of construction workers.

Proactive measures

Focus groups were conducted to suggest proactive measures that can address the factors

Inadequate Safety Supervision (High Importance)

- Encouraging, measuring, and monitoring frontline supervisor accountability
- Providing safety resources (e.g., designated site safety representatives) and fostering clear and professional communication between frontline supervisors and workers

Poor Risk Perception (High Importance)

Poor assessments of the risks that workers are exposed to. For example, some experienced workers rely on their experience, believing that they don't need PPE; some young workers often see work as an adventure and are overconfident.

- Emphasizing the stakes involved in non-compliance with PPE
- Enhancing the critical thinking of workers through interactive risk perception training (dialoguing with workers about "what-if" and worst-case scenarios)

Lack of Climate Adaptation (High Importance)

- Improving PPE supply and providing specialized training and resources for wearing PPE in adverse weather conditions
- Providing cooling and heating stations for workers operating in intense weather conditions

Lack of Safety Training (High Importance)

- Providing training at the same time that PPE is provided, to all new hires, and as a yearly refresher
- Improving management support for educational and outreach programs

Lack of Management Support (High Importance)

- Emphasizing the reputational and financial costs of accidents due to PPE non-compliance
- Increasing leadership involvement, visibility (e.g., bringing management into the safety program to demonstrate PPE use), and accountability

Poor Quality, Fit, and Comfort (High to Moderate)

- Improving the supply of PPE (different styles and sizes)
- Improving PPE training and gaining worker input on PPE fit and comfort

PPE Increases Restrictions (High to Moderate)

- Gaining worker input on potential restrictions and addressing them
- Conducting case-by-case evaluations to reach a resolution

Somatic Health Effects (High to Moderate)

- Exploring PPE alternatives for individuals with health problems and employing case-by-case decision-making
- Raising worker awareness of the possible relationships between PPE use and certain health conditions

PPE Increases Work Effort (High to Moderate)

- Collecting employee feedback on PPE options that will not adversely affect effort and encouraging workers to suggest PPE alternatives
- Showing the costs of accidents associated with failure to use PPE

PPE Increases Work Time (Moderate)

- Providing explanations and examples of the time-costs of incidents and ensuring adequate time for PPE use and installation
- Letting workers know they will be evaluated more favorably if they work safely than if they work quickly but unsafely

Performance Pressure (Moderate)

- Emphasizing the costs of safety incidents associated with PPE non-compliance
- Ensuring that field leadership understands that safety cannot be sacrificed and providing rewards and incentives for good safety performance

Unstable Employment Status (Moderate to Low)

- Ensuring that all employees are trained to the same standard
- Developing a temporary worker program and partnership with staffing agencies

Lack of PPE Availability and Accessibility (Moderate to Low)

- Improve PPE availability by introducing technologies such as PPE vending machines and QR codes to make PPE distribution more efficient
- Improve PPE funding by obtaining available grants and allocating PPE pay items within the contracts of smaller subcontractors

Lack of Safety Rules and Regulations (Moderate to Low)

- Ensuring safety programs are up to date, posting safety programs at all job sites, and communicating OSHA PPE requirements
- Enforcing PPE compliance and creating a sliding scale for safety performance penalties

Cultural and Language Barriers (Low)

- Implementing multi-language literature and training (e.g., using images and pictures in training)
- Fostering an inclusive workplace culture

Peer Pressure (Low)

- Encouraging and rewarding positive peer pressure around PPE use
- Discouraging negative peer pressure via effective field monitoring and education

It is important to note the difference between peer pressure and social proof. Social proof is the influence the actions of coworkers have on general action; if many people are seen doing one thing, others are likely to follow in order to fit in.

Key Findings

This study helps decision-makers prioritize resource allocation to the most critical PPE non-compliance factors

- The primary root causes of PPE non-compliance are inadequate safety supervision, poor worker risk perception, lack of PPE climate adaptation, lack of upper management support, and lack of safety training

This study illuminates the importance of addressing resource limitations, especially among residential construction firms. Project owners and general contractors should consider allocating funds specifically for safety programs when hiring smaller firms and only select contractors that agree to comply with a safety plan.

- Convey to construction company leaders the importance of PPE compliance and the reputational and financial costs of non-compliance
- Improve leadership accountability, focus on front-line supervisors
- Encourage, incentivize, measure, monitor, and reward the use of PPE
- Solicit worker input to provide PPE that better fits and adapts to different climates

Dissemination Plan

- Scientific research paper
- White paper (available by the end of November)
- Full PPT Presentation
- New Senior Elective at LTU - Construction Safety Management (available in the Spring semester, 2023)
- Presentation at the Michigan Safety Conference, April 18-19 2023
- Presentation at the ASSP Safety Conference and Exposition, June 5-7 2023

The Year Ahead Presented by Ross Sanders

- November 2022 - Project selection
- May 2023 - Presenting the Initial Research Findings - To be validated by firm members (in-person meeting)
- August 2023 - Sharing Research Recommendations
- September 2023 - Providing Training Modules - Presenting training modules in PPT format

Research Timeline Presented by Dr. Ahmed Al-Bayati

- Submit research ideas by Nov. 18th via e-mail
- Voting link will be available between Nov. 21st and Nov. 29th
- Voting results will be sent out on Wednesday Nov. 30th

Public Relations Presented by Ross Sanders and Matt Roush

Future opportunities

- Release announcing new CSRC members (Nov 28)
- Release of findings of initial CSRC workplace safety study (Dec 5)
- National Work Zone Awareness Week (Apr 17-21)
- Michigan Safety Conference promotion (Apr 18-19)
- National Construction Safety Week (May 1-5)
- Coffee with MIOSHA workplace safety and health discussion (May)
- Release of findings of 2023 research study (Oct)

New members are asked to provide a quote (if choosing to) for press release by Friday, November 18th

Website Updates Presented by Gabby VanAmberg

The CSRC website is a public website where the research findings are available to be shared with the public. All CSRC members have received or will receive log-in credentials to view member resources such as meeting minutes, firms and municipalities, research results, forms to be filled out, etc.

Please Note – Partner Perks Presented by Ross Sanders

- LTU Tuition 35% discount for partners of the university & family members
- Career services & alumni contact info

Future Research Ideas Discussion open to present members

- Construction robotics study and potential changes in safety dynamics
- Understanding what is underground, unmarked cables or other hazards (fiberoptic, gas, etc.)
- PPE Climate adaptability
- Worker visibility, technological implementations, material visibility may be reduced as usage continues (Car tech detecting nearby workers/hazards, etc.)
- Find most effective education mediums on underground dangers (Social media, billboards, etc. outreach?)
- Media effecting awareness, (children are exposed to different media and safety precautions, consider finding more effective forms of education)
- Private contractors following outdated safety guidelines, how do cost issues and lack of regulation effect interfacing between construction projects and the public, and how can public safety and worker safety work together
- Fall protection – what factors contribute to noncompliance in fall protection & PPE, what is effective, what is the root issue, find common issues and resolutions (through education, training, etc.)
- Substance abuse among construction workers, accessibility changes, rewritten policies, daily tests - how to ensure safety and health of workers

Question of sampling distribution of factor ranking study, emphasis on importance of inclusion of all focus groups

Safety appreciation awards presented to founding members

Micheal Darga, Giffels Webster

Michael Listello, DTE Energy Jonathan

West, Carhartt

Fred Zorn, City of Southfield

Thanks and Closing Remarks Presented by Ross Sanders

Adjournment

The meeting was adjourned at 4:25 PM EDT.

Attendees:

- LTU Representatives
 - Dr. Ahmed Al-Bayati, CSRC Director
 - Dr. Elin Jensen, Department Chair
 - Dr. Liping Liu, Associate Dean
 - Mark Brucki, Associate Vice President of Economic Development
 - Matt Roush, Director of Media Relations
 - Kim Henderson, Administrative Coordinator
 - Ross Sanders, Director of Industry Partnerships
 - Gabby VanAmberg, Web Production Coordinator
- Member Representatives and Guests
 - Mark Ginter, Construction Safety Consultant, MIOSHA
 - Andrew Rener, President, Bouma Corporation
 - Michael Listello, Safety and Health Supervisor, DTE
 - Tim Tokarz, Safety Manager, Barton Malow
 - Lindsey MacDonald, Yellow Flag
 - Jonathan West, Innovation Senior Manager, Carhartt
 - Adam Gut, Vice President, Frank Rewold & Sons
 - Gail Wyckhouse, Education Manager, MISS DIG 811
 - Michael Darga, Partner, Giffels Webster
 - Fred Zorn, City Administrator, City of Southfield