

# NJ FOIS INVESTIGATION REPORT



*Fatal Occupational Injuries Surveillance Project*

FOIS 15-NJ-022

October 28, 2016

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## Stagehand Falls To His Death While Dismantling Temporary Seating System

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A 61-year-old male stagehand died after falling from temporary multi-level seating risers. The incident occurred in the auditorium of a large entertainment facility in NJ. On the day of the incident, the victim and several other workers were dismantling temporary tiered seating that had been assembled in an auditorium for an event the previous evening. The victim and another worker were team-carrying an 86-pound floor platform to be stacked in a nearby pile. As they were walking the platform to the stack, the victim, who was walking backwards, stepped on an area where there was no flooring and fell through the open area. The victim suffered blunt impact injuries of the head and neck, and died approximately two days later.

### Contributing Factors

- No personal fall arrest equipment worn
- No fall prevention system in place

NJ FOIS investigators recommend that these safety guidelines be followed to prevent similar incidents:

- **Fall protection (personal fall arrest equipment and/or fall prevention system) must be in place while assembling or dismantling temporary multi-level seating risers that exceed six feet in height.**
- **A protocol for construction and dismantling of tiered seating systems should incorporate fall protection.**
- **Task-specific health and safety training regarding fall protection should be provided to all employees who work with temporary tiered seating systems.**
- **A safety and health plan based on a job hazard analysis should be developed by the employer and followed where workers are assigned tasks.**



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## **INTRODUCTION**

In spring 2015, NJ FOIS staff was notified of the death of a 61-year-old stagehand/laborer who died after falling through an open area of a temporary multi-level seating riser system. The incident occurred in a large auditorium of an entertainment facility in NJ. The victim had worked for this company for over 10 years and had many years of experience assembling and dismantling temporary seating systems. Training was provided annually through an outside vendor to all employees at the facility who work at heights. The training was generalized about fall protection and not specific to the temporary bleacher system. Approximately four months prior to the incident the company provided this annual training, however the victim had not attended. It is unknown whether he attended any of the prior trainings.

A NJ FOIS investigator received notification from the OSHA Area Office and conducted an investigation. Additional information was obtained from the medical examiner's report, death certificate, and the news media.

## **INVESTIGATION**

The incident occurred in the auditorium (approximately 31,000 ft<sup>2</sup>) of an entertainment facility in NJ, with several thousand employees staffed on site. On the day of the incident, a crew of 14 workers were assigned the task dismantling a large, custom-built temporary multi-level seating system used for an event the day before. Twelve of the 14 worker crew, including the victim, were considered service/on-call employees, and worked on an as needed basis. The tiered seating system was a complex structure of platforms (also called decks), metal frame units, boards, and railings (Figure 1). The system adds 21 rows of stadium-style seating that extend up to a height of 19 feet. It takes approximately eight hours to build the system and eight hours for it to be dismantled.

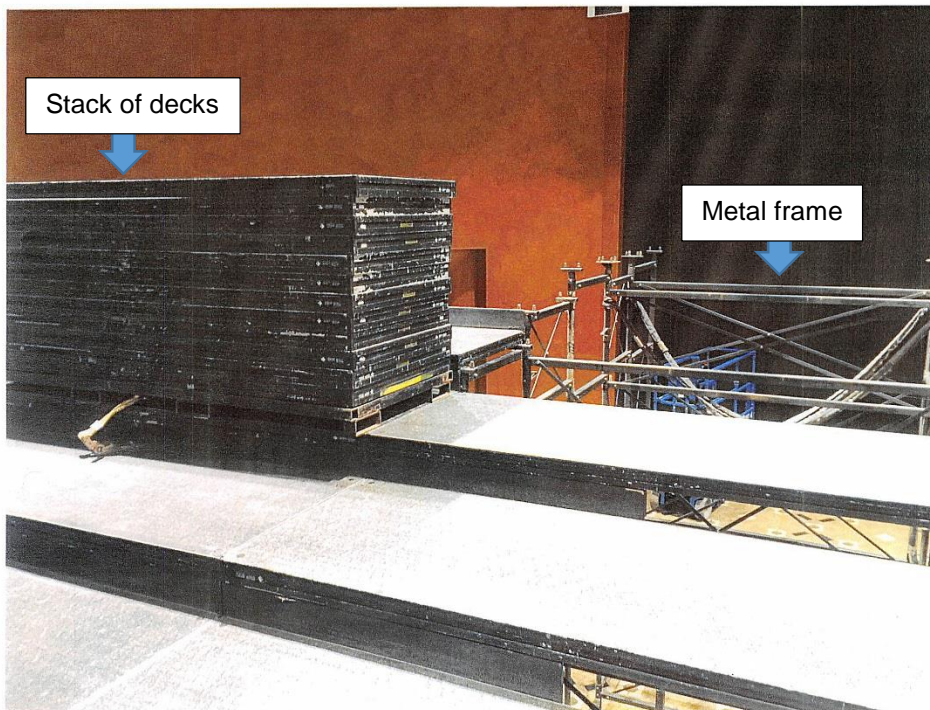
To build the seating system, units of the metal frame and stacks of decking (Figure 2) were brought in by forklifts. The metal frame was assembled (by unfolding and connecting the frame units), while workers in teams of two manually lifted and installed 395 decks into place; most of these decks measured three-feet-wide by eight-feet-long and weighed 86 pounds each. The decking installation began at the lowest level and then moved upward. Once the decks were in place, the railing was installed. The dismantling of the seating system, also known as a "loadout," was conducted in the opposite order to the building procedure. First, the railings were removed followed by team-lifting the decks and placing them in stacks. This began at the top of the system and continued until ground level. As the decks were being removed, scissor lifts were used to move the stacks of decking and frame units.

The incident occurred during the dismantling phase. The crew had already removed several rows of decking and were working approximately 12 feet off the ground. The victim and another worker were team-lifting 86-pound decks and carrying them back to stacks. Figures 3-4 illustrate what occurred. Approximately two minutes before the incident, there was another crew that was working parallel to the victim's crew (Figure 3). This parallel crew removed a deck (deck "A" in Figures 3-4) near the stack the victim and his coworker were using. A review of the video footage of the incident indicates that the victim saw the crew removing and stacking deck "A." A few minutes later, the victim and his coworker were team-carrying a deck (deck "B" in Figure 4) to the stack. The victim was walking backwards as they carried the deck. As they approached the stack, the victim stepped where deck "A" had been, and fell backwards through the opening. He landed on a metal cross member of the bleacher frame and sustained traumatic injuries to his back and head. He died of these injuries approximately two days later.

**FIGURE 1. Incident site, top view of multi-level seating system in auditorium.**

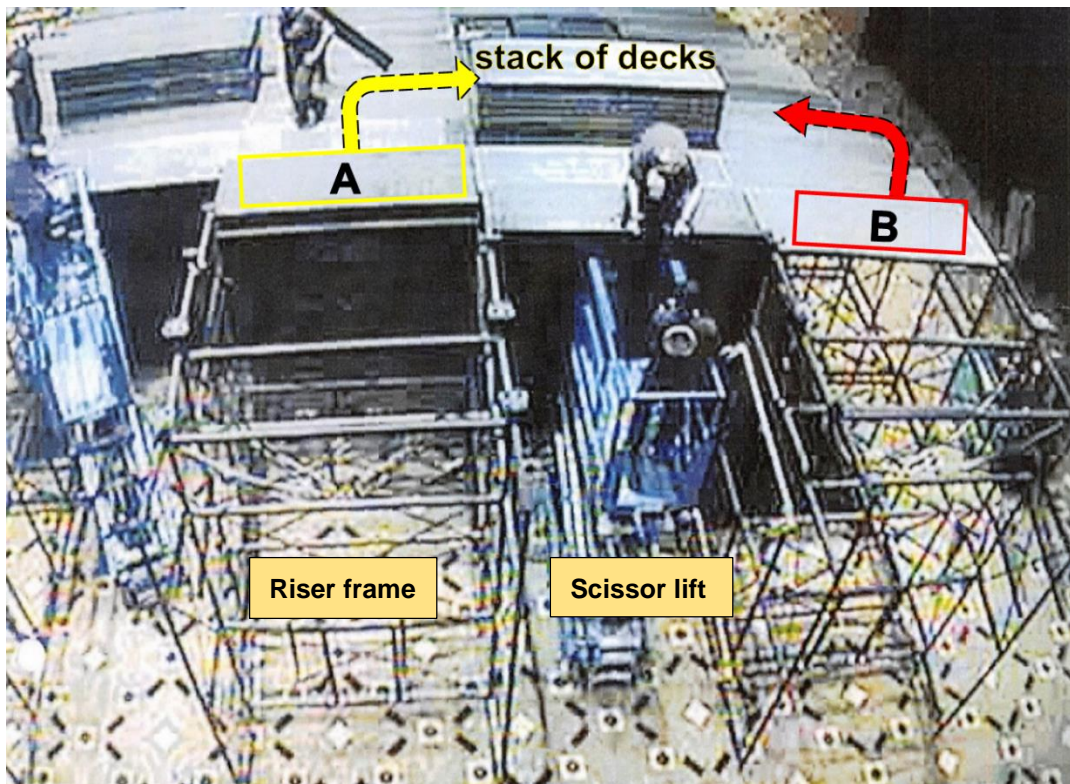


**FIGURE 2: Close-up view of multi-level seating risers.**

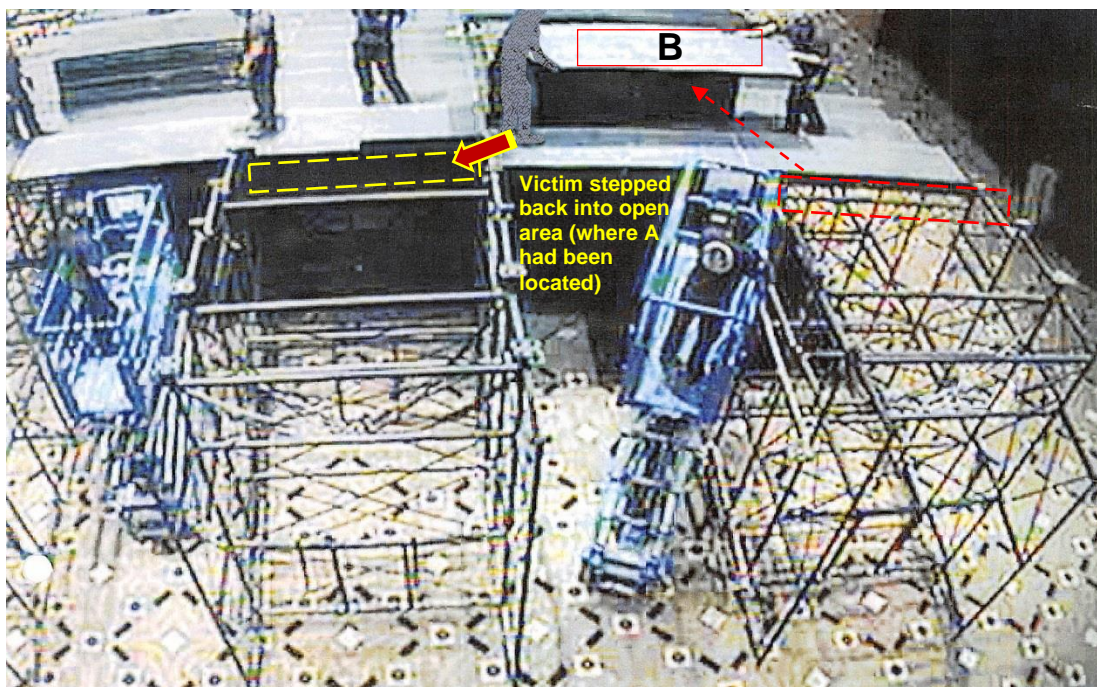




**FIGURE 3. Incident scene: workers dismantling tiered seating system shortly before incident. Note location of decks “A” and “B.”**



**FIGURE 4. Incident scene: workers dismantling tiered seating system Deck “B” being carried by victim and coworker to stack on right. Note open area where Deck “A” had been located.**

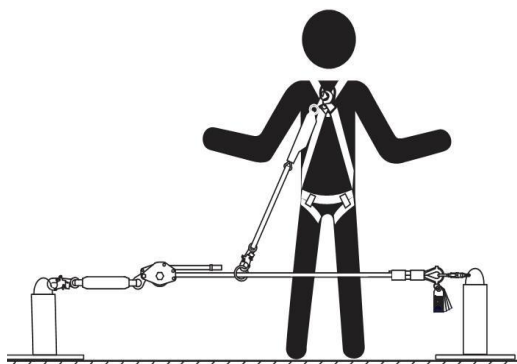


## RECOMMENDATIONS/DISCUSSIONS

**Recommendation #1: Fall protection (personal fall arrest equipment and/or fall prevention system) must be in place while assembling or dismantling temporary multi-level seating risers that exceed six feet in height.**

**Discussion:** As per 29 CFR 1926.501(b), any employee working on a walking surface that is at a height greater than six feet must be protected from falling by either fall prevention (guardrail, netting), or a personal fall arrest system.<sup>1</sup> In this case, no fall protection was in place during either the building or dismantling of the tiered seating system. Guardrails were in place on outermost edges of the system, but these are largely not in place during this work (see Recommendation #2). Personal fall arrest equipment should be worn at all times while working on the bleacher system (or at a minimum when at heights greater than six feet). NJ FOIS recommends a horizontal lifeline system be installed, to which workers can attach a retractable lanyard. The horizontal lifeline system could be either permanently affixed to the walls or ceiling of the auditorium (Figure 5a), or be a type of free-standing, mobile horizontal lifeline system (Figure 5b). The mobile system could be setup such that the overhead horizontal bar runs perpendicular to the workflow. The workers could attach their personal fall arrest systems onto the overhead bar. The attachment point can slide across the bar, allowing the workers to move freely across the seating system. In addition, the lifeline system itself can be moved to better accommodate the position of the workers as the bleachers are being built or disassembled.

**Figure 5a-b. Examples of horizontal lifeline systems.**



**a) Permanently affixed anchor points\***



**b) Mobile overhead A-frame system\*\***

\*Picture used with permission from 3M Fall Protection

\*\*Picture used with permission from Flexible Lifeline Systems, Inc.

**Recommendation #2: Protocols for construction and dismantling of tiered seating systems should incorporate health and safety, including worker/crew communication and fall protection.**

**Discussion:** NJ FOIS recommends that employers should reevaluate the protocol for building and dismantling temporary tiered seating systems in order to incorporate fall protection. In this case, in addition to the details outlined in Recommendation #1, the sequence of building/dismantling the seating system should be carried out such that the guardrails are installed first and removed last. Although the guardrails were not specifically involved in the incident, a serious fall hazard on the edge of the seating system exists when the guardrails are not in place.

Another recommended protocol modification is to include enhanced communication between workers. NJ FOIS recommends continuous communication between all crew members, especially when working at heights greater than six feet.

**Recommendation #3: Task-specific health and safety training regarding fall protection should be provided to all employees who work with temporary tiered seating systems.**

**Discussion:** Employers should provide training regarding the hazards of working at heights greater than six feet, including the proper use, installation, and or maintenance of fall protection systems. 29 CFR 1926.503(a) stipulates that employers must provide a fall protection training program and ensure that all workers be trained on the hazards of working at heights, and the correct procedures of use and maintenance for specific fall protections systems in place.<sup>2</sup> NJ FOIS recommends that all employees be required to participate in this training prior to working at heights.

**Recommendation #4: A safety and health plan based on a job hazard analysis should be developed by the employer and followed where workers are assigned tasks.**

**Discussion:** Employers should conduct a job hazard analysis, with the participation of employees, of all work areas and job tasks. A job hazard analysis should begin by reviewing the work activities for which the employee is responsible and the equipment that is needed. Each task is further examined for mechanical, electrical, chemical, or any other hazard the worker may encounter. A source of information on conducting a job hazard analysis can be obtained from the US Department of Labor.<sup>3</sup> It is important to note that following the incident, the employer purchased a motorized telescoping riser system to eliminate the hazard.



## APPENDIX

### RECOMMENDED RESOURCES

It is essential that employers obtain accurate information on health, safety, and applicable OSHA standards. NJ FOIS recommends the following sources of information which can help both employers and employees:

#### **U.S. Department of Labor, Occupational Safety & Health Administration (OSHA)**

Federal OSHA can provide information on safety and health standards on request. OSHA has several offices in New Jersey that cover the following counties:

☎ Hunterdon, Middlesex, Somerset, Union, and Warren counties.....	732-750-3270
☎ Essex, Hudson, Morris, and Sussex counties.....	973-263-1003
☎ Bergen and Passaic counties.....	201-288-1700
☎ Atlantic, Burlington, Cape May, Camden, Cumberland, Gloucester, Mercer, Monmouth, Ocean, and Salem counties.....	856-757-5181
💻 Web site: <a href="http://www.osha.gov">www.osha.gov</a>	

#### **New Jersey Public Employees Occupational Safety and Health (PEOSH) Program**

The PEOSH Act covers all NJ state, county, and municipal employees. Two state departments administer the Act: the NJ Department of Labor and Workforce Development (NJDLWD), which investigates safety hazards, and the NJ Department of Health (NJDOH), which investigates health hazards. PEOSH has information that may also benefit private employers.

##### NJDLWD, Office of Public Employees Safety

☎ Telephone: 609-633-3896

💻 Web site: [http://lwd.dol.state.nj.us/labor/lsse/employer/Public\\_Employees\\_OSH.html](http://lwd.dol.state.nj.us/labor/lsse/employer/Public_Employees_OSH.html)

##### NJDOH, Public Employees Occupational Safety & Health Program

☎ Telephone: 609-984-1863

💻 Web site: <http://nj.gov/health/workplacehealthandsafety/peosh/>

##### On-site Consultation for Public Employers

☎ Telephone: 609-984-1863 (health) or 609-633-2587 (safety)

💻 Web site: <http://nj.gov/health/workplacehealthandsafety/peosh/consultation.shtml>



## **New Jersey Department of Labor and Workforce Development, Occupational Safety and Health On-Site Consultation Program**

This program provides free advice to private businesses on improving safety and health in the workplace and complying with OSHA standards.

☎ Telephone: 609-984-0785

💻 Web site: [http://lwd.dol.state.nj.us/labor/lsse/employer/peosh\\_consultation.html](http://lwd.dol.state.nj.us/labor/lsse/employer/peosh_consultation.html)

## **New Jersey State Safety Council**

The New Jersey State Safety Council provides a variety of courses on work-related safety. There is a charge for the seminars.

☎ Telephone: 908-272-7712.

💻 Web site: [www.njsafety.org](http://www.njsafety.org)

## **Internet Resources**

Other useful Internet sites for occupational safety and health information:

- CDC/NIOSH – [www.cdc.gov/niosh](http://www.cdc.gov/niosh)
- USDOL Employment Laws Assistance for Workers and Small Businesses – [www.dol.gov/elaws](http://www.dol.gov/elaws)
- National Safety Council – [www.nsc.org](http://www.nsc.org)
- NJDOH FACE/FOIS reports – [http://nj.gov/health/workplacehealthandsafety/occupational-health-surveillance/fatal-injuries/njface\\_reports.shtml](http://nj.gov/health/workplacehealthandsafety/occupational-health-surveillance/fatal-injuries/njface_reports.shtml)
- CDC/NIOSH FACE – <http://www.cdc.gov/niosh/face/>
- OSHA – [www.osha.gov](http://www.osha.gov)
- ANSI – [www.ansi.org](http://www.ansi.org)

## **REFERENCES**

1. 29 CFR 1926.501(b)(1), Duty to have fall protection; *Unprotected sides and edges*.
2. 29 CFR 1926.503(a), Training requirements; *Training Program*.
3. *Job Hazard Analysis*. US Department of Labor Publication # OSHA-3071, 1998 (revised). USDOL, OSHA Publications, PO Box 37535, Washington DC 20013-7535

**Fatal Occupational Injuries Surveillance (FOIS) Project**  
**Investigation # 15-NJ-022**

This report was prepared by staff members of the New Jersey Department of Health's Occupational Health Surveillance Unit. The goal of FOIS is to prevent fatal work-related injuries by studying the work environment, the worker, the task, the tools the worker was using, the energy exchange resulting in the fatal injury, and the role of management in controlling how these factors interact. FOIS gathers information from multiple sources that may include interviews of employers, workers, and other investigators; examination of the fatality site and related equipment; and reviewing OSHA, police, and medical examiner reports, employer safety procedures, and training plans. The FOIS program does not determine fault or place blame on employers or individual workers. Findings are summarized in narrative investigation reports that include recommendations for preventing similar events. All names and other identifiers are removed from FOIS reports and other data to protect the confidentiality of those who participate in the project.

Please visit the NJ FOIS Web site at <http://nj.gov/health/workplacehealthandsafety/occupational-health-surveillance/fatal-injuries> or the CDC/NIOSH FACE Web site at [www.cdc.gov/niosh/face/faceweb.html](http://www.cdc.gov/niosh/face/faceweb.html) for more information. The contents of this report are solely the responsibility of the authors and do not necessarily represent the official views of the CDC.



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