



## The National Institute for Occupational Safety and Health (NIOSH)

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# Temporary Hispanic Laborer Dies After Being Struck by a Turning Device at a Concrete Product Manufacturing Facility - Massachusetts

**Case: 02-MA-016-01**

**Release Date: July 6, 2004**

## SUMMARY

On June 27, 2002, a 30-year-old male temporary worker was fatally injured at a concrete casting facility where he was assigned to work. The victim was hired as a laborer to help with the manufacturing of concrete products. While assisting with the removal of a 1,000-gallon concrete septic system tank from its form, the victim was struck in the head and back by the boom section of a steel turning device. The boom section of the turning device slipped off of the tines of the forklift that was supporting it. Two co-workers including the forklift operator lifted the boom off of the victim as a third co-worker placed a call for emergency assistance. Within minutes, representatives from the local police and fire departments arrived on site. The victim was transported to a local hospital where he was pronounced dead. The Massachusetts FACE Program concluded that to prevent similar occurrences in the future, employers should:

- **develop a locking mechanism to ensure that concrete casting turning devices used with forklifts are securely attached to the tines**
- **provide barrier guards to ensure that all employees are safe from possible hazards while completing tasks**
- **establish written procedures for rotating concrete castings**
- **consider using an overhead crane system for rotating concrete castings**
- **ensure that workers employed through temporary agencies are provided site and task specific safety and health training**
- **ensure that workers who are part of a multilingual workforce comprehend safety training for their assigned tasks.**

## INTRODUCTION

On June 28, 2002, the Massachusetts FACE Program was notified by the Occupational Safety and Health Administration (OSHA) through the 24-hour Occupational Fatality Hotline, that on June 27, 2002, a 30-year-old Spanish speaking male laborer was fatally injured when he was struck by a forklift attachment. An investigation was initiated, and on July 25, 2002 the Massachusetts FACE Program Director and an investigator traveled to the concrete product manufacturer's facility where the owner was interviewed. The police report, death certificate, corporate information and OSHA information were reviewed during the course of the investigation and the temporary agency where the victim was employed was interviewed via telephone during the following week.

The employer, a concrete product manufacturer had been in business 30 years at the time of the incident. The concrete product manufacturer employed 10 full-time employees and one part-time employee, the bookkeeper. The concrete product manufacturer also had four temporary workers, including the victim, through a temporary agency. The full-time employees held job titles such as office manager, plant manager, truck driver and the temporary workers held the job title laborer. One temporary worker, not the victim, could speak English and acted as a translator for the other three workers. The victim had been working at the concrete product manufacturer, through the temporary agency, for approximately one year at the time of the incident. The victim did not have union representation.

The concrete product manufacturer did have a designated individual in charge of safety, but did not have a written safety and health program. The victim's training was primarily on-the-job including hands on training about how to handle heavy loads safely and how to perform different concrete casting tasks.

## INVESTIGATION

The concrete product manufacturer produced various concrete items including septic system tanks, manholes, bulkhead, catch basins and stairs. The products are manufactured onsite and delivered by company personnel and company trucks to the desired location of the buyer.

The victim's main task as a laborer at the concrete product manufacturer was assisting in the manufacturing of concrete products, such as assisting in stripping concrete castings from the forms and cleaning the forms. The temporary agency stated that they only hired out non-English speaking workers with at least one worker that could speak both the primary language of the temporary workers, in this case Spanish, and the management where they were placed, in this case English. In addition, the temporary agency reported that they assigned one bilingual worker to a company for up to every three non-English speaking workers assigned to that same company.

The concrete manufacturer reported that the victim's primary language was Spanish and that he could speak a few words of English. The forklift operator involved in the incident was a permanent fulltime employee of the concrete products manufacturing company and only spoke English. The concrete manufacturer also reported that the forklift operator and the victim used hand motions to communicate while performing tasks and that most of the tasks they performed together occurred multiple times a day.

At the time of the incident, the concrete product being manufactured was a 1,000-gallon septic system tank. This process consisted of pouring concrete into a form which is upside-down during this part of the manufacturing process. The estimated weight of the septic system tank when cured was approximately 8,000 pounds and measured approximately 5

½ feet long by 8 ½ feet wide and 5 feet high. The septic system tank casting is stripped from the form and turned right side-up after it has cured (approximately 12 hours). The task of turning the casting right side-up, the task being performed at the time of the incident, is performed inside the manufacturer's garage four times a day.

The process of removing the concrete septic system tank from the form and rotating it 180 degrees to right side-up required a laborer, forklift operator, forklift, and a turning device ([Figure 1](#)). The forklift involved in the incident was diesel powered and had a maximum lifting capacity of 17,525 pounds and a maximum lifting height of 13 feet. The turning device, which is used to lift and rotate the septic system tank, attaches to the forklift by inserting the forklift tines into the rectangular cutouts of the turning device's boom ([Figure 1](#)).

When the casting has cured, the sides of the form are unlocked and opened to expose the casting. The turning device is lowered around the concrete casting by lowering the forklift tines. At this point, the laborer secures the turning device around the concrete casting by tightening two metal clamps located at the turning device's base ([Figure 1](#)). The casting is raised out of the form when the forklift operator raises the forklift's tines. The casting is then set onto wooden blocks on the floor to prepare for rotation.

To prepare the turning device for the septic system tank, the laborer removes the side pins on the turning device, located in the telescoping side posts, to increase the height of the turning device's boom. This will give the concrete casting the space needed to rotate ([Figure 2](#)). After the side pins have been removed, the forklift operator raises the tines, which raises the boom section by extending the length of the telescoping side posts. The base section of the turning device remains on the floor during this process. The laborer re-pins the side pins locking the turning device's height.

Next, the laborer removes the pivot pins ([Figure 2](#)) from the turning device's base and stands off to the side of the casting. This unlocks the base from the rest of the turning device allowing the base to rotate, keeping the rest of the turning device stationary. The entire turning device, including the concrete casting, is raised off the floor as the forklift operator raises the forklift's tines allowing the base and casting to rotate 180 degrees placing the casting in the upright position.

In this incident, the victim had pulled out the pivot pins from the turning device's base and stepped back a couple feet facing the casting. The concrete product manufacturer reported that the victim's location would have been out of the forklift operator's line of sight. Before the forklift operator started to raise the entire turning device and casting to rotate it, the boom slipped off the forklift tines, pivoting at the unlocked base pivot area, where the side posts attach to the clamping section. The boom fell away from the forklift, over the victim, striking him in the head causing him to fall to the floor. The victim landed on his buttock with his upper body bent forward and the boom against his upper back and head.

The forklift operator heard a loud noise and then noticed that the boom had slipped off the tines. He exited the forklift and found the victim underneath the boom. The forklift operator attempted to lift the boom off of the victim but was unable to do so. He then went to request help from another co-worker. The boom was lifted off of the victim and a call was placed for emergency assistance. Within minutes, local paramedics and police were on site. The victim was transported to a local hospital where he was pronounced dead.

## CAUSE OF DEATH

The medical examiner listed the cause of death as blunt head and chest trauma.

## RECOMMENDATIONS/DISCUSSION

**Recommendation #1: Employers should develop a locking mechanism to ensure that concrete casting turning devices used with forklifts are securely attached to the tines.**

**Discussion:** The turning device involved in the incident attached to forklift by inserting the forklift tines into two rectangular holes in the turning device's boom section. There was no mechanism to keep the turning device securely attached to the forklift tines. Employers should develop a locking mechanism, with input from the original turning device manufacturer, that would prohibit the boom from sliding off of the forklift tines. This could be done by designing a clamp that would attach to the top section of the boom around the rectangular cutouts. When the forklift tines are inserted through the cut outs, the clamps would then be tightened down onto the tines prohibiting the boom from sliding off of the tines.

During the site visit, the concrete product manufacturer and the representatives from the FACE program had discussed some locking mechanism ideas including the above idea.

**Recommendation #2: Employers should provide barrier guards to ensure that all employees are safe from possible hazards while completing tasks.**

**Discussion:** The task of removing a large casting from a form poses hazards for all employees that are standing or walking in close proximity to the task. In this case, a physical barrier, such as a chain link fence, could be erected around the work area that would allow enough space for the removal and rotation process to be performed safely. The victim could have entered the work area located inside the fence to perform his tasks only when instructed by the forklift operator. Once the victim had removed the pivot pin, he could have exited the area allowing the forklift operator to perform the next step, rotating the casting to the upright position safely within the guarded area.

**Recommendation #3: Employers should establish written procedures for rotating concrete castings.**

**Discussion:** After the victim removed the pivot pins, he stood near the casting and out of the view of the forklift operator. According to the concrete product manufacturer owner, the established unwritten procedures for the septic tank rotating task would have had the victim standing off to the side, away from the turning operation, and in clear view of the forklift operator after removing the pivot pins.

Employers should develop written procedures and safety checklists that outline how to perform the steps of each task in the safest possible manner. A protocol for rotating a concrete septic system tank safely should include, but not be limited to, positioning the laborer at a safe distance in between their specific tasks and the forklift operator continually having the laborer in sight.

When foremen do not speak the same language as the workers they supervise, it is imperative that a system is devised to communicate safety commands that are understood by both parties. In this case, the forklift driver could have called the worker's name to indicate that he was not in his line of sight; the victim would have been trained that he should move away from the casting and be visible to the driver.

**Recommendation #4: Employers should consider using an overhead crane system for rotating concrete castings.**

**Recommendation #5: Employers should ensure that workers employed through temporary agencies are provided site and task specific safety and health training.**

**Discussion:** Employees of a temporary agency should be provided general safety and health training by the temporary agency. Companies that contract with temporary agencies are responsible for providing site and task specific safety and health training to the temporary employees. In addition, if a temporary employee is hired out to one company for a long period, as in this incident, then the temporary employee should be provided with annual refresher training that should include any new hazards at the workplace.

**Recommendation #6: Employers should ensure that workers who are part of a multilingual workforce comprehend safety training for their assigned tasks.**

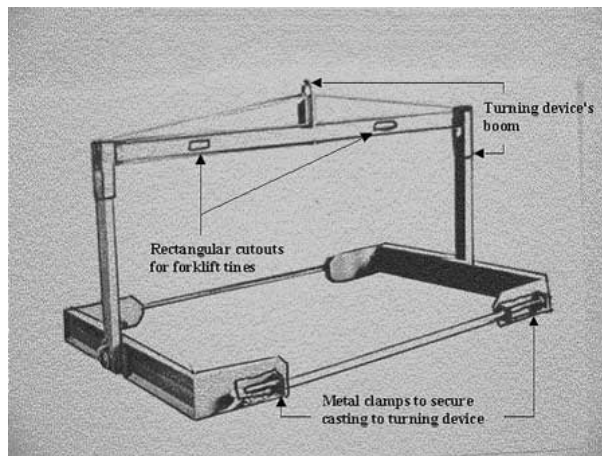
**Discussion:** Overcoming language and literacy barriers is crucial to providing a safe work environment for a multilingual workforce. Companies should develop and provide training for workers in a language and at a literacy level workers are able to comprehend. This also applies to any training documents that require a worker's signature. Interpreters should be available to explain to workers any work environment and task completion changes that were made since the training materials were produced.

## REFERENCES

1. Code of Federal Regulations, 29 CFR 1926.601 (b)(4) Motor vehicles, Government Printing Office
2. ILO, Safety and Health in Construction: An ILO code of practice, Geneva, International Labor Office, 1992
3. NIOSH FACE Report Number 2003-06, Hispanic Carpenter Dies After Being Crushed Between the Loader Bucket of a Backhoe/Loader and a Concrete Building – North Carolina.

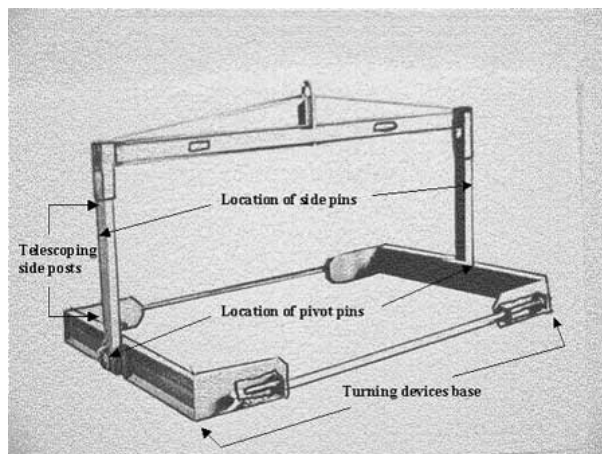
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## ILLUSTRATIONS



**Figure 1 – Turning device similar to the one used during the incident**

- Boom section
- Rectangular cutouts for forklift tines
- Metal clamps to secure casting to turning device



**Figure 2 – Turning device similar to the one used during the incident**

- Locations of side pins
- Telescoping side posts
- Location of pivot pins
- Turning device base

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