

Together With



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## Willow Island Cooling Tower Failure

The Pleasants Power Station at Willow Island, West Virginia, was undergoing expansion in 1978. The new plant was to have two generators in addition to the two smaller units that were already there. By April 1978 one natural draft cooling tower for the generators had been built, and a second was under construction.

On April 27, the second tower had reached a height of 166 feet. Just after 10 AM, as the third lift of concrete was being raised, the cable hoisting that bucket of concrete went slack. The crane that was pulling it up fell toward the inside of the tower and the previous day's concrete, termed lift 28, began to collapse. Concrete began to unwrap from the top of the tower, first peeling counter-clockwise, then in both directions. A jumble of concrete, wooden forms and metal scaffolding fell into the hollow center of the tower. Fifty-one construction workers were on the scaffold at the time.

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## Work Fatality Study Focuses On Falls In Tennessee

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A study was conducted to investigate the causes and reasons for fall fatalities in the state of Tennessee. The TOSHA retrospective study that examined fall fatalities from 2006-2010 yielded some interesting results. The proximate causes were placed in six categories in descending order from the most fall fatalities to the fewest.

1. No Fall Protection Present - 17 fatalities
2. Improper Work Surface - 14 fatalities
3. Fall from Ladder - 13 fatalities
4. Misc. and Inconclusive Causes - 9 fatalities
5. Structural Collapse - 2 fatalities
6. Damaged Fall Protection - 1 fatality

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## Annual Report on TOSHA Activities

With long-tenured TOSHA employees becoming eligible for retirement, TOSHA has several employees promoted into manager positions. These include the following new managers: Manager of Standards, Larry Hunt; Manager of Industrial Hygiene Compliance, Jeffrey Campbell; Manager of Consultative Assistance, Garrett Rea.

Steve Hawkins was appointed Administrator of TOSHA.

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All fell to their deaths. Ten members of one family were killed in the accident. The collapse of the natural-draft hyperbolic concrete cooling tower was investigated by OSHA and a team from the National Bureau of Standards. The federal Occupational Safety and Health Administration levied fines against three construction companies involved in the project, charging negligence. A federal grand jury heard evidence in the case, but returned no criminal indictments.

The investigation included on-site inspections, laboratory tests of construction assembly components and concrete specimen, and analytical studies. Based on the results of field, laboratory, and analytical investigations, it was concluded that the most probable cause of the collapse was the imposition of construction loads on the shell before the concrete of lift 28 had gained adequate strength to support these loads. The analysis of the shell indicated that the collapse initiated at the part of the shell in lift 28 where cathead no. 4 was located. It further showed that



calculated stress resultants at several points in that part equaled or exceeded the strength of the shell in compression, bending and shear. The failure of these points in that part of the shell would have propagated to cause the collapse of the entire lift 28.

**Reference** "Investigation of Construction Failure of Reinforced Concrete Cooling Tower at Willow Island, West Virginia (NBS IR 78-1578)



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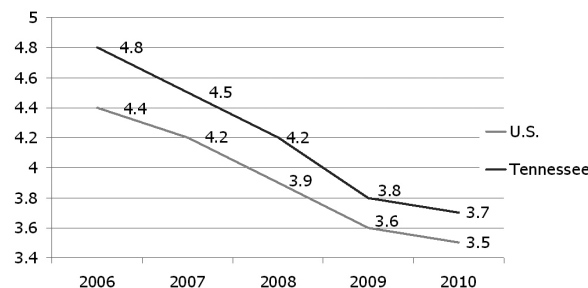
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## Annual Report on TOSHA Activities (continued)

Currently, TOSHA has 92 positions and is striving to get all of those filled with persons committed to the safety and health of Tennessee workers. Ten years ago in 2002, TOSHA had 105 positions available. The good news is that despite the loss of positions, the Injury and Illness Rate in Tennessee has continued to fall.



From July 1, 2011, through June 30, 2012, TOSHA compliance conducted 1,926 inspections, identified 7,589 hazards, and proposed \$2.8 million in civil penalties. Consultative Services conducted 411 visits at the invitation of the employer, assisted employers with the correction of 2,827 hazards, and proposed \$0 in penalties. Eighty-five discrimination complaints were filed with the agency during that same time frame; three cases were forwarded to the Tennessee Attorney General for prosecution when TOSHA could not reach a settlement.

Beginning in October 2012, TOSHA will have completed its Special Emphasis Program (SEP) on Occupational Noise and will replace it with a similar program on Abrasive Blasting. Other SEPs remain on carbon monoxide, falls, excavation and trenching, amputations, combustible dust, hexavalent chromium, and process safety management in chemical facilities.

## Work Fatality Study Focuses On Falls In Tennessee

(continued)



It is no surprise that "No Fall Protection" was the leading cause of fall fatalities in the State of Tennessee. This cause accounted for 29% of the fall fatalities in Tennessee from 2006 to 2010. The issue of not using fall protection while working from heights is easily recognized by industry and regulatory agencies. The issue is also easily corrected in most instances ; however, continued diligence is necessary for management, workers, and safety professionals.



## Cranes in Demolition and Underground Construction

On Friday, August 17, 2012, OSHA published a Direct Final Rule (DFR) correcting a notice issue from the final cranes and derricks standard published August 9, 2010. This DFR will make the requirements in the crane and derricks standard applicable to demolition and underground construction. The DFR will place all construction crane work under the final cranes standard (subpart CC of 1926) and delete current subpart DD Cranes and Derricks Used in Underground Construction and Demolition.

OSHA has also published a companion notice of an identical proposed rule. This DFR will become effective on November 15, 2012, unless a significant adverse comment is received by September 17, 2012. If OSHA does not receive significant adverse comments, the Agency will publish notice within 90 days confirming the effective date of this direct final rule. If there should be significant adverse comment on the direct final rule, the direct final rule will be withdrawn and OSHA will proceed to consider the essentially identical companion proposed rule.

The amendments in this DFR will result in more stringent requirements for cranes and derricks used in demolition and underground construction work. Therefore, states and territories with approved State Plans are required to adopt comparable amendments to their standards for cranes and derricks used in demolition and underground construction within six months of OSHA's promulgation of the final rule (i.e., the date OSHA publishes confirmation of the effective date). TOSHA will do so.



# L EARN & LIVE

## Consultative Services On-Site Problem Solver

A customer with a noisy abrasive blasting process contacted TOSHA Consultative Service for help. The first on-site consultation visit found that workers were exposed to noise at 93 decibels. This level is above the 85 decibel threshold where a hearing conservation program is required and above the 90-decibel Permissible Exposure Limit requiring the use of hearing protection or reduction of noise through engineering controls.



This employer wished to reduce exposure in lieu of a hearing conservation program and continued employee exposure to noise. The customer, with guidance from the on-site consultants, identified preventative maintenance needs (openings, loose fittings, missing mufflers) and during a second visit, it was found that these changes reduced the noise to 86 decibels, still above the 85-decibel threshold. Hearing protection was used as an interim protection step during these efforts. Further guidance was provided, and the customer installed sound barrier insulation, changed air-cleaning procedures and relocated air exhaust via snorkels towards the ceiling. A follow-up consultation visit showed that this dropped the noise levels to 82 decibels, a considerable reduction below the initial 93 decibels, and below the 85-decibel threshold where a hearing conservation program is required. As a result, as long as these controls are maintained, no hearing conservation program or hearing protection is required.

This guidance was provided by TOSHA Consultants Garrett Rea - Program Manager,  
Tina Kline-Douglas - IH Supervisor, and Ashely Barker - IH In-Training