data from first reports of injury. These records-based data were supplemented with information collected in the first year of an active injury reporting and investigation program among unionized residential and drywall carpenters in Missouri representing 3 million work hours per year. The latter provided more detailed descriptions of the circumstances of injury and potential points of intervention.

We reviewed 450 injuries resulting from nail guns. Among residential carpenters/homebuilders, nail gun injuries account for the largest proportion of injuries resulting from being struck (20-35%). The vast majority of injuries involved the extremities and eyes. However one individual was shot in the chest, one was shot in the head and three sustained head injuries from falling guns. A number of victims were not actually operating the guns themselves when injured. Their injuries resulted from complete penetration of the receiving structure and accidentally discharging guns.

Ricocheting nails or wood, accidental discharge, penetration of structures, falling objects, unsafe location or operation of guns and falls all contributed to these injuries. Safety mechanisms for these devices were often bypassed. Findings indicate that combined engineering design improvements, personal protective equipment such as appropriate eye protection, housekeeping improvements to prevent falls, and effective operator training could decrease these common and potentially devastating injuries.

F6.5 Eye Injuries at a Large Construction Project: A Better Understanding Through Compensation Data and Injury Investigations—Jackson LL, Borgerding JA, Lowery JT, Glazner JE

The construction of Denver International Airport (DIA) in 1989 through 1994 represented more than 31 million hours of work completed by over 32,000 workers. In December 1990, an owner-controlled insurance program (OCIP) began providing workers' compensation insurance for all contractors and included an on-site medical clinic and designated provider/medical referral system.

We analyzed the OCIP injury database of 4,634 claims with medical payments along with injury reports (for ~90% of claims) and accident investigation reports (for ~50% of claims) from the building of DIA to develop a better understanding of construction-related eye injury risk factors.

An estimated 14% (649 claims) of compensation claims with medical treatment (other than simple first aid) were eye injuries. Eye injuries occurred mostly to men (96%) who were frequently younger than 40 (66%). A foreign body in the eye was most frequently reported (87%) with some burn (8%), contusion (2%), and laceration (1.5%) eye injuries. The majority of eye injuries occurred disproportionately to special trade contractors—SIC 17 (68%). Heavy construction contractors, SIC 16, and building construction, SIC 15, had far fewer eye injuries (15% and 10%, respectively). Among the construction trades, electricians had the most eye injuries (30%), followed by cement masons (19%), operating engineers (13%), plumbers (10%), and iron workers (9%).

Injury investigation reports provided additional details on the injury event and for about one half of the injuries indicated if safety eye protection was worn at the time of injury. Among these cases with additional information, most workers reported wearing some form of safety eye protection at the time of injury and that objects commonly went around the protection—particularly when working overhead.

The OCIP injury data in combination with the investigation reports provide a unique prospective on construction eye injuries.

Session: G1.0
Title: The NIOSH Fatality Assessment and Control Evaluation Project's Role in the Reduction of Occupational Fatalities
Category: Special Session
Organized by Virgil Casini, NIOSH FACE Team
Moderator(s): Paul Moore

G1.1 Overview of the National Institute for Occupational Safety and Health (NIOSH) Fatality Assessment and Control Evaluation (FACE) Program—Higgins DN

The NIOSH Fatality Assessment and Control Evaluation (FACE) program is a research program designed to identify and study fatal occupational injuries. The goal of this program is to prevent occupational fatalities across the nation by identifying and investigating work situations at high risk for fatal injury and then formulating and disseminating prevention strategies to those who can intervene in the workplace.

The FACE project currently has two major components. The first component is the in-house program which began in 1982. Five states (NC, SC, TN, PA, VA) voluntarily notify NIOSH of traumatic occupational fatalities occurring in the targeted areas that have included confined spaces, electrocutions, machine-related, falls from elevations and logging. In-house FACE is currently targeting investigations associated with machinery, deaths of youths under 18 years of age, and street/highway construction work zone fatalities.

The second component is the State-based FACE program which began in 1990. Currently, 15 State health or labor departments have cooperative agreements with NIOSH for conducting surveillance, targeted investigations, and prevention activities at the State level using the FACE model. These states include, AK, CA, IA, KY, MA, MO, MN, NE, NJ, OH, OK, TX, WA, WV, WI.

Surveillance data and investigative reports are maintained by NIOSH in a database. NIOSH researchers use this information to identify new hazards and case clusters. FACE information may suggest the need for new or revised regulations to protect workers. NIOSH publications are developed to highlight these high risk work situations and to provide safety recommendations. These publications are disseminated to target audiences and are available on the Internet through the NIOSH homepage or through the NIOSH publications office.

G1.2 New Jersey FACE Investigation Leads to Legislative Changes—Bost P

This presentation will explain the course of events that led to legislative changes following the electrocution of a lifeguard at a public swimming pool. On June 14, 1994, a twenty-year-old college student was working as a lifeguard at an apartment complex swimming pool. When he went into the pump room to adjust the chlorine flow, he died after contacted a pump motor that had been energized with 220 volts due to faulty wiring.

The NJ Department of Health & Senior Services, Fatality Assessment & Control Evaluation (FACE) Program was notified and conducted an investigation two weeks after the incident. Investigators found that the 20 year-old pump equipment had not been inspected or maintained for at least ten years and made recommendations to improve swimming pool electrical safety. Recognizing that this problem may exist at other public swimming pools, NJ FACE published a warning bulletin highlighting the incident and our recommendations. This bulletin was distributed to NJ public swimming pools by the local health departments during their sanitary inspections.

As a result of the FACE investigation and warning bulletin, a municipality changed their codes to require periodic inspections of swimming pools. In February 1996 two members of the NJ State Assembly introduced a bill to modify the state construction code establishing basic electrical standards for swimming pools. The bill was passed on February 10, 1999 requiring that all public swimming pools, hot tubs, and spas obtain an electrical certificate of approval. A licensed electrical contractor or testing agency would issue this certificate following an inspection of the pools bonding, grounding, and general electrical systems. A facility would not be allowed to legally open without obtaining this certificate.

G1.3 Youth Farm Worker is Killed in PTO Driveline Entanglement—Johnson WE, Rautiainen RH

In January 1999, a 17-year-old high school student working part-time for a dairy farmer was killed when his clothing was caught by the unshielded power take-off (PTO) driveline of an old grinder-mixer. He had been helping the farmer add sacks of feed supplement to ground corn in the mixer. The supplement hopper on this machine was not operational and the hammer mill opening was used instead. This opening was next to the unshielded driveline and a flywheel, which was disconnected and not rotating at the time. After having added the supplement, the farmer was closing the hammer mill cover. The youth was standing next to him, near the rotating unshielded PTO driveline. Suddenly the farmer heard a thump, then noticed that the boy had been caught and entangled around the driveline at the flywheel clutch. The idling tractor stalled from the force, and the youth died instantly from decapitation.

Iowa FACE investigators learned about the incident from a co-worker, who was alerted by a radio news report. Information was gathered from several sources including a site investigation. The NIOSH Division of Safety Research was also notified of this fatality by the United States Department of Labor, Wage and Hour Division, and this report was produced in collaboration with NIOSH FACE staff. The report was requested by an Iowa Senator to be used in a subcommittee on agricultural safety standards for youth farm workers.

G1.4 The NIOSH, OSHA, NATE Partnership for the Prevention of Injury to Telecommunication Tower Construction and Maintenance Workers—Casini VJ

The widespread use of wireless communications services has fueled the construction of towers to hold transmitting devices for cellular phones, personal communication services, and television and radio broadcast antennas. The Federal Communications Commission (FCC) estimates that at least 75,000 towers have been constructed in the United States, and industry groups indicate that 20,000 to 50,000 towers are erected each year. The Telecommunications Act of 1996 is expected to promote more tower construction to meet the increased demand for wireless communication services.

Based on an analysis of data from the Bureau of Labor Statistics' Census of Fatal Occupational Injuries, a minimum of 95 workers died during the construction or maintenance of telecommunication towers during the 6-year period 1992-1997. Falls accounted for the majority of deaths of workers involved in telecommunication tower construction or maintenance. Eighteen percent of the deaths were associated with tower collapse. The remainder of deaths occurred when workers were struck by objects, such as parts of equipment or towers. NIOSH has investigated 8 tower-related fatal incidents. Two of the case studies will be presented.

In an attempt to improve the safety and health of tower workers, OSHA established a Tower Task Force in 1997. NIOSH has been an active member of this task force and has made several key contributions to the task force's products.

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ABSTRACTS

National Occupational Injury Research Symposium

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