NIOSH HEALTH HAZARD EVALUATION REPORT

HETA #2005-0369-3034
Hurricane Katrina Response

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DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

PREFACE

The Hazard Evaluation and Technical Assistance Branch (HETAB) of the National Institute for Occupational Safety and Health (NIOSH) conducts field investigations of possible health hazards in the workplace. These investigations are conducted under the authority of Section 20(a)(6) of the Occupational Safety and Health (OSHA) Act of 1970, 29 U.S.C. 669(a)(6) which authorizes the Secretary of Health and Human Services, following a written request from any employers or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

HETAB also provides, upon request, technical and consultative assistance to federal, state, and local agencies; labor; industry; and other groups or individuals to control occupational health hazards and to prevent related trauma and disease. Mention of company names or products does not constitute endorsement by NIOSH.

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SUMMARY

On August 29, 2005, Hurricane Katrina struck coastal areas in Alabama, Florida, Louisiana, and Mississippi, causing numerous deaths, massive infrastructure damage, and flooding. The two hardest hit areas were along the Gulf Coast of Louisiana and Mississippi. The State of Louisiana and the City of New Orleans invited the Centers for Disease Control and Prevention (CDC) to assist with the rebuilding of the city's public health system. Between September 11, 2005, and October 29, 2005, investigators from CDC's National Institute for Occupational Safety and Health (NIOSH) were deployed to New Orleans and Baton Rouge. Their main objectives were to assist Federal, state, and local agencies in addressing occupational safety and health issues, to perform health and injury surveillance and exposure assessments among workers, to perform outreach to vulnerable workers, and to develop and disseminate occupational health information. Three teams of personnel responded to numerous requests for assistance in evaluating exposures to mold, chemicals, biological agents, floodwaters, dust and dried flood sediment, flood debris, and noise.

Except for a limited number of noise exposure samples above the NIOSH recommended exposure limit and carbon monoxide levels above the NIOSH ceiling limit, environmental sampling for a variety of substances including asbestos, metals and dust did not reveal levels above recognized occupational exposure limits. A summary of the findings was shared with workers and employers. Safety hazards such as broken glass posed a risk to workers. Worksites in the flood-ravaged areas had varying degrees of capacity for hazard recognition, evaluation, and control. In general, the need for readily accessible, pertinent, understandable information regarding workplace hazards and exposures was apparent throughout the response, and distribution of information proved challenging.

Keywords: emergency response, hurricane, flooding, floodwater, contamination, remediation, mold, sediment, dust, debris, carbon monoxide, noise, safety, OSHA, U.S. Army Corps of Engineers, fire fighters, police, New Orleans, Louisiana, Gulf Coast.

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INTRODUCTION

On August 29, 2005, Hurricane Katrina struck coastal areas in Alabama, Florida, Louisiana, and Mississippi, causing flooding, massive infrastructure damage, power outages, and numerous deaths and injuries. The two hardest hit areas were along the Gulf Coast of Louisiana and Mississippi.

The State of Louisiana and the City of New Orleans invited the Centers for Disease Control and Prevention (CDC) to assist with the rebuilding of the city's public health system. The CDC assembled a multidisciplinary collection of scientists from its various centers, including the National Institute for Occupational Safety and Health (NIOSH), to respond to the complex public health needs of New Orleans and surrounding parishes. The NIOSH personnel staffed the Occupational Health Team, one of several teams (others included Communications, Injury, Mental Health, and Environmental Teams) comprising the CDC Hurricane Katrina response.

Three Occupational Health Teams from CDC/NIOSH (Teams 1, 2, and 3) were deployed consecutively to New Orleans by the CDC Director's Emergency Operations Center (DEOC) in Atlanta, Georgia, to support CDC's mission in New Orleans. These teams consisted of industrial hygienists, medical officers, and engineers. The overall mission of these teams was to provide guidance on occupational health and safety needs and perform exposure assessment for workers involved in the cleanup and rebuilding of New Orleans and the surrounding parishes in the aftermath of the hurricane. The mission of Team 1 was to conduct a "needs assessment" of the situation on the ground by identifying hazards and establishing communication with various worker groups. Based on input from Team 1, the mission of Team 2 was to conduct environmental sampling of occupational exposures. The mission of Team 3 was to conduct outreach and provide occupational safety and health information to various worker groups. Team missions were modified as appropriate in response to local conditions, as activities occurred, and to build upon previous efforts. Additionally, CDC/NIOSH sent occupational health specialists to the Louisiana Department of Health and Hospitals at their request to assist in providing guidance on worker safety, health, and exposure issues.

The Worker Safety and Health Annex of the Emergency Support Function 8 (ESF-8), which is in the National Response Plan, was also put into effect for the first time during Hurricane Katrina.[1] This annex describes the responsibilities that the Occupational Safety and Health Administration (OSHA) has to assist Federal employees and their contractors during disaster recovery operations, as well as the support role NIOSH plays to OSHA during such a response.

This report summarizes the occupational health activities of the CDC/NIOSH Hurricane Katrina response personnel and highlights the findings and recommendations that were made to workers, employers, and agencies in Louisiana. During the wide variety of activities performed by CDC/NIOSH personnel, recommendations were made to those groups that were directly involved with each of the specific activities performed by the Occupational Health Teams. Where recommendations were made by CDC/NIOSH personnel to wear respirators, recommendations were also made for their proper use following applicable OSHA respiratory protection program regulations.[2]

ACTIVITIES

Occupational Health Team 1

Mission: Address occupational exposure issues for management and union officials, workers, and government agencies.

Between September 11 and September 29, 2005, Occupational Health Team 1 members conducted visual assessments of work activities throughout the New Orleans metropolitan area. Some of the challenges Team 1 members faced

included difficulties in communication, housing, and transportation. A major challenge for Team 1 members was the vastness of the disaster area, and systematically locating sites where work was being carried out. To identify such sites, Team 1 members conducted tours throughout various parts of the city including suburban, downtown, French Quarter, and convention center areas to observe response and cleanup operations and talk to workers about their work activities and use of personal protective equipment (PPE). Many of the hazards assessed during this period occurred during the following general activities:

- Entering flooded facilities to identify general safety hazards
- Cleaning and sanitation activities in buildings and hotels
- Tree cutting and removal of debris

A variety of potential chemical exposure and safety hazards were found throughout many of the activities observed. These included exposures to gases such as carbon monoxide (CO) and hydrogen sulfide (H_2S), dust and dried flood sediment, floodwaters, noise, mold, and safety hazards such as broken glass. Specific activities carried out by Team 1 follow.

Carbon Monoxide and Other Gases

Team 1 members responded to a request from the Army to assess working conditions at Charity Hospital. At the time, members of the Army and Navy were using diesel-powered pumps and generators to pump water out of the hospital's basement morgue in order to remove approximately 30 bodies. A member of the Navy staff was monitoring the area with a four-gas meter (CO, H_2S, oxygen [O_2], and lower explosive limit [LEL]). Results reported to Team 1 members were well below occupational exposure limits (OELs). NIOSH investigators made recommendations to wear hearing protection in the area, follow confined space procedures, and extend the flex-duct that carried diesel exhaust away from the building and occupied areas.

Team 1 members made a return visit 2 days later. It was reported that a Navy team fully equipped with self-contained breathing apparatuses (SCBAs) had entered the basement the previous day and reported that the CO and H_2S readings had peaked on their instrument (neither these readings nor the scale on the instrument were provided). Therefore, the removal of the bodies had not begun as they were looking for equipment to ventilate the space. It was described that the only personnel entering the space were trained Navy personnel. Recommendations were reiterated to follow confined space procedures while entering the area after they completed pumping out the basement.

Team 1 members observed approximately 85 workers cleaning up one of the city's major hotels in the French Quarter. Gasoline-powered pumps were running in a low-level parking garage. Measurements collected by Team 1 members using a direct-reading instrument showed CO levels as high as 220 parts per million (ppm). Team 1 members immediately recommended opening a garage door, which resulted in a decrease of CO levels to 25 ppm. Additionally, hearing protection, eye protection, and respirators were recommended for grinding operations also occurring on-site. It was found that workers at the site were not immunized according to CDC recommendations for recovery workers, so arrangements were made with a nearby disaster medical assistance team (DMAT) to give the workers appropriate immunizations shots such as hepatitis B and tetanus.

Floodwaters and Dried Flood Sediment

A major concern brought to the attention of Team 1 members was worker exposure to floodwater and the dust and dried flood sediment left after floodwater receded. Team 1 members recommended appropriate respirators to several New Orleans area agencies, including Jefferson Parish Emergency Medical Service (EMS), U.S. Army Corps of Engineers (USACE), National Park Service (NPS), and the City of New Orleans.

Team 1 members and USACE officials visually assessed the work areas at the 17th Street Canal, where one of the major levee breaks occurred. Worker concerns included potential exposures to the dust from disturbing dried flood sludge or river mud. Concerns were also expressed about exposures to biological matter in the floodwater aerosol generated by aerators returning floodwater to Lake Pontchartrain. Team 1 members recommended that workers avoid close proximity to the aerators that shoot spray 15–25 feet above the water surface and that those who work near or downwind from aerators be provided with NIOSH-certified N-95 respirators. Recommendations were also provided regarding excavator and earth-moving activities at the broken levee site. Team 1 members observed an excavator operator moving dirt and gravel (crushed rock) in the area, prompting concerns of exposure to airborne silica. The operator was working in an open cab, transferring material with a bucket. Until an exposure assessment was completed, Team 1 members recommended that the worker wear a half-mask, NIOSH-certified N-95 respirator and follow all applicable OSHA respirator requirements, including medical evaluation and fit testing.[2]

Workers were observed at a pump station on a canal near the Murphy oil spill in St. Bernard Parish. Because of concerns about potential exposure to volatile organic compounds (VOCs), Team 1 members recommended an exposure assessment in areas near oil spill cleanups. Team 1 members also recommended that, until exposure results were available, workers who must spend time in this area should be offered half-mask respirators with organic vapor cartridges (combined with N-100 or P-100 filters if they were exposed to rock dust). If the workers reported eye irritation, Team 1 members recommended providing them with full-face respirators with the same type of cartridges.

Authorities with the NPS reported concerns for their workers who were performing clean-up work and tree trimming and removal in several historic sites in and around New Orleans. One of the primary NPS historic sites in the area was the Chalmette National Battlefield in St. Bernard Parish. Primary concerns included exposure to contaminants in dried floodwater sediment including heavy metals, silica, and hydrocarbons on the dust particles as a result of the Murphy oil spill in Chalmette and St. Bernard Parish. Tasks with dust exposures included mowing historic battlefields covered with dried sediment, demolition of NPS buildings and clean-up of historic buildings/sites, tree removal, and street sweeping. Interim recommendations were provided including providing NIOSH-certified N-95 respirators for workers exposed to dust. NPS officers requested an exposure assessment for particulates; Team 1 members relayed this request to Occupational Health Team 2.

Team 1 members attended a meeting sponsored by the City of New Orleans about their No-Notice Flood/Levee Breach Emergency Evacuation Plan, which included a safety plan for responders in flood-prone areas. While the plan addressed decontamination of personnel who come into contact with floodwaters, it was recommended that the plan also address the issue of PPE for response workers who came into contact with floodwater. Upon request, recommendations on PPE for workers exposed to floodwater were also sent to an Army representative present at the meeting.

Noise

Concerns of overexposure to noise were common. During the site visit to the 17th Street Canal worksite, large pumps were observed pumping water back into the canal from the neighborhood, and an excavator operator was moving large amounts of crushed gravel, resulting in potentially excessive noise levels. No hearing protection devices (HPDs) were provided to the workers on-site. Similar observations were made at other temporary pump station locations. Until an exposure assessment could be completed to quantify exposures, Team 1 members recommended that workers near the pump be provided adequate HPDs (foam earplugs or earmuffs with noise reduction rating [NRR] >27 dBA).

Mold

One of the major issues that confronted Team 1 members was concerns about mold exposure during cleanup operations. Team 1 members provided information and recommendations to various groups, including the City of New Orleans, private businesses, and several search and rescue groups. Team 1 members also participated in discussions with other CDC teams on how to safely clean flood-damaged buildings and homes; provided technical assistance and information on mold cleanup to building managers, custodians, and others who were responsible for commercial building and school maintenance; and provided recommendations for the cleaning and remediation of flood-contaminated heating, ventilating, and air conditioning (HVAC) systems.[3] Additionally, Team 1 members assisted with a press release on mold for the Mayor of New Orleans and provided information on molds, especially on PPE concerns, to the City of New Orleans Health Department.

Safety

A variety of safety hazards were observed during cleanup operations. Team 1 members observed a construction worker pushing glass windows from the 15th floor of a hotel resulting in shards of glass more than 1 foot in diameter falling to the street and sidewalk below. No warning signs were observed, and the area had not been cordoned off by the contractor, representing an imminent hazard of death or serious injury to passersby and any workers at street level. Recommendations were made for the contractor to establish a safe perimeter around the hazardous zone with construction tape, cones, and flares. A return site visit later that day revealed that these recommendations had not been implemented, illustrating the challenge of government oversight over the thousands of contractors moving into New Orleans for cleanup and rebuilding.

Occupational Injury and Disease Surveillance

Medical officers on Team 1 advised local and state officials of the potential occupational health risks associated with the flooding when working around the City of New Orleans. They met with New Orleans leadership, state leadership and federal representatives from OSHA, the Environmental Protection Agency (EPA), and the National Institute for Environmental Health Sciences (NIEHS) concerning potential health hazards when returning to businesses. Sites visited by Team 1 members included the Superdome, City Hall, and Tulane University Library. Team 1 members provided verbal recommendations and written materials from CDC to local and state officials, working groups and managers, rescue, recovery, and cleanup workers about the following issues:

- Contaminated floodwater
- Unclean or unstable work environments
- Bites and scratches, rabies during animal rescue, dermatologic conditions, sharps injuries, infectious disease risks, insect and vector risk (including West Nile virus)
- Immunization recommendations
- Work stress, post-traumatic stress disorder, including Substance Abuse and Mental Health Services Administration (SAMHSA) referrals, and referrals to Louisiana State University (LSU) psychiatric services
- Handling human remains and establishment of temporary morgues

Additionally, Team 1 members provided assessment tools for others to use to assess the potential occupational safety and health impacts of the Hurricane Katrina response including evacuation centers, hospitals and medical care facilities, and shelters.

Offers of assistance were extended to the Federal Emergency Management Agency (FEMA) Urban Search and Rescue (USAR) New Orleans Emergency Operations Center (EOC) in analyzing data they were collecting on

deployed USAR team members; to the George Washington University Medical College in analyzing data they were collecting on New Orleans Police Department (NOPD) personnel who were going on leave; to the NOPD mental health provider; and to approximately 10 medical units in the New Orleans area to obtain occupational injuries and illness data affecting post-Katrina New Orleans workers.

Team 1 medical officers, through contacts made in the field, identified medical units at a private security company and the police department jail at the Greyhound Bus Depot. They then distributed worker illness and injury surveillance forms at these two sites. Because of required evacuation for Hurricane Rita, follow-up by Team 1 members was not possible for the Greyhound Bus Depot. Staff at the private security company medical clinic did not use the forms provided because they found them to be more complicated and time-consuming than just using a notebook to record information regarding medical visits. Their staff compiled the medical visit information into a Microsoft Excel file and provided that to Team 1 members. During the 25 days that this company was working in New Orleans (September 3–27, 2005), there were 270 reported clinic visits among the 150 employees. Table 1 shows the presenting complaints or diagnoses that occurred on five or more visits.

Occupational Health Team 2

Mission: Perform quantitative exposure assessments at worksites throughout the New Orleans metropolitan area and follow-up on contacts made by Team 1 members.

Team 1 members were evacuated from New Orleans on September 21, 2005, in anticipation of Hurricane Rita. Once Hurricane Rita subsided, Occupational Health Team 2 was deployed; their work began on September 29, 2005. Priority was placed on re-establishing communication with contacts made by Team 1, developing further contacts and cooperation with OSHA and USACE and its contractors working in the city, as well as responding to requests for assistance on occupational safety and health issues. Many of the concerns that were brought to the attention of Team 2 members were a reflection of the activities that were developing over time in the city's cleanup efforts. Therefore, assistance with information on contact with floodwaters diminished, for example, as assistance in evaluating potential exposures during debris removal increased. Concerns about entering flooded buildings and potential exposure to dust and dried flood sediment were still prevalent. In particular, medical officers on Team 2 made efforts to locate specific populations of workers, particularly those who had worked through the days during and immediately after the Hurricane, to assist them in evaluating symptoms and to determine the scope of illness, injury, and stress.

Entering Flooded Buildings

Assistance was requested from the U.S. Office of the Inspector General (OIG) to provide guidance for workers to enter the Tulane School of Medicine in New Orleans to remove boxes of patient records. Team 2 members accompanied OIG officers into the building. The hallway and the records office were intact. Because the ventilation and air conditioning systems had not been operational for over a month, the air in this location was noticeably stale and musty; however, there were no visible signs of water damage or mold growth. Team 2 members used direct reading instruments to monitor for airborne particulates, CO, carbon dioxide (CO_2), total VOCs, and lower explosive limit while the record recovery operation took place. No hazardous conditions were determined to be present.

A site visit was performed in response to a request from the NOPD to provide health and safety guidance for workers entering the NOPD Headquarters (HQ). The first floor of the NOPD HQ had been flooded with approximately 5 feet of water, leaving a significant amount of mold in the offices on that floor, which included archival rooms of personnel records. Team 2 members were briefed about concerns related to entering the building to retrieve and remove large

quantities of paper personnel records. Team 2 members provided information on health issues related to mold exposures and guidance on proper PPE for working in areas contaminated with floodwater and mold. They accompanied the requesting officer into his personnel offices on the first floor to observe the mold contamination. These offices had seen significant floodwater damage, and large quantities of mold growth were observed on walls, chairs, and other furniture. Team 2 members observed restoration work commencing in other areas of the first floor, including large fans intended to dry out affected areas. They recommended that the contractor install fans in offices as soon as possible to minimize further mold growth due to the high humidity levels and significant dampness still in this area. The use of N-95 respirators and gloves when performing activities in these areas was also recommended.

Team 2 members were requested to brief federal and state police (Louisiana Attorney General's Office; Louisiana State Police; OIG; Immigration, Customs, and Environmental [ICE] Federal Officers; Louisiana Department of Justice) concerning potential exposure and health hazards when entering Memorial Hospital in New Orleans to collect evidence. Team 2 members briefed the officers concerning the health and exposure risks of floodwaters and sediment, debris, mold, odors, heat stress, work stress, infectious risks, and risks of handling human and animal remains. Additionally, the team provided observational site assessment of the second, fourth and seventh floors where evidence was being collected. No electricity was available in the building, requiring the use of flashlights for visibility. No water damage was observed on the seventh floor; on the second and fourth floors, signs of water damage to a number of ceiling tiles were observed due to overflow from sinks on the above floor. In addition, fallen wet debris around existing pipes was evident. Floodwaters had not reached any of these floors. No visible mold growth was observed during the assessment. Trash, debris, litter, oxygen tanks, and broken glass were distributed throughout the hallways, common rooms, and patient rooms. There were multiple trip hazards and sharps from broken glass in various areas, but no obvious airborne exposure hazards. A direct-reading particulate counter was used to evaluate total airborne particulate levels on these three floors. Results were consistent with particulate levels observed in poorly ventilated indoor environments. Team 2 members concluded that the officers collecting evidence in the building needed no respiratory protection. The standard precautions of nitrile gloves and steel-toed boots were adequate for the tasks being conducted.

Flood Debris Collection, Transfer, and Removal

As the cleanup from Hurricane Katrina continued, vegetative debris and construction and demolition (C&D) debris from throughout the New Orleans metropolitan area was being collected and transported to transfer locations. From these locations, the debris was reloaded onto larger trucks and transferred to sanitary landfills.

One of the sites where construction/demolition debris from Jefferson Parish was being collected was in a 200-acre field adjacent to the Louis Armstrong New Orleans International Airport. The site was operated by Ceres Environmental, one of three main contractors with the USACE for debris removal. The USACE contracted the operation of the site to Ceres Environmental who subcontracted the site's management to Beverly Construction. An average of 23,000 cubic yards (yd^3) of debris from throughout Jefferson Parish was brought onto the site each day by trucks under contract to Ceres. Once onsite, the debris was sorted to remove refrigerators, air conditioners, microwave ovens, compressed gas cylinders, and other potentially hazardous items. Once these items had been removed, 5,000 to 6,000 yd^3 of the remaining debris (about 20%–25% of the incoming) was loaded onto trucks for transport to sanitary landfills outside of the New Orleans area. None of the debris brought onto the site was scheduled for burning.

Work was conducted at the site for 12 hours (06:30 to 18:30) a day, 7 days a week. Beverly

Construction had an onsite staff of eight heavy equipment operators (trackhoes and bulldozers), one light equipment operator (front end loader), three laborers (traffic control staff), and two work supervisors. Eight to 10 USACE staff were onsite during daily operations. During a visit to the site, Team 2 members discussed safety issues with the Beverly Construction safety officer who raised concerns about the following health issues: contact dermatitis, noise exposures, upper respiratory irritation from dust, and infectious disease risks from bacteria in flood-contaminated debris. There were additional concerns about work-related stress because of long work shifts with minimal breaks and post-traumatic stress, particularly among those who lost homes and possessions because of Hurricane Katrina. At the time, the safety officer required the use of hard hats, safety glasses, and steel-toed shoes. N-95 respirators, hearing protection, and gloves were recommended but their use was not enforced.

Team 2 members conducted air sampling for total and respirable dust in the personal breathing zone (PBZ) of five workers. All samples were collected for at least 7 hours. The samples were sent to an American Industrial Hygiene Association (AIHA)-accredited laboratory for gravimetric and elemental (metals and minerals) analysis. A return site visit was conducted to perform asbestos and respirable dust/silica air sampling and noise dosimetry to assess potential exposures among USACE and Beverly Construction workers. During a portion of the day, the environmental conditions were very dusty, prompting the USACE to temporarily suspend operations. Following adequate dust suppression efforts by water tank spraying over a period of 2 hours, debris collection activities were resumed. Samples were collected over a 7–8 hour period of the work shift. Results of total and particulate dust sampling showed levels below occupational exposure limits. Personal noise dosimetry sampling conducted on three employees showed noise doses near or above the NIOSH recommended exposure limit (REL), but below the OSHA action level (AL). NIOSH investigators recommended that these employees wear hearing protection (Summary A of the Appendix).

A site visit was conducted at a debris site at North Galvez and St. Louis Streets operated by ECC, one of the three main USACE prime contractors for debris removal. Team 2 members collected air samples and performed noise monitoring on personnel actively involved in the collection and reduction of debris. One PBZ air sample and three area air samples were collected and analyzed for total particulates with an additional analysis for elements (metals and minerals). Two area air samples were collected and analyzed for respirable dust with additional analysis for silica. The air samples were collected over approximately 6 hours. All air sample results showed levels below occupational exposure limits. Two bulk samples of debris pile dust were collected and analyzed for elements, asbestos, and crystalline silica (quartz and cristobalite). Low concentrations of minerals and metals were found in the bulk samples; they did not contain any detectable asbestos. Personal noise dosimetry was performed on a quality control (QC) inspector and a trackhoe operator for approximately 6 hours. All exposures were below the NIOSH and OSHA criteria for the actual time worked. Recommendations made by Team 2 members are in Summary B of the Appendix.

Team 2 members performed a site visit in response to a request from Axis Remedial Services (a subcontractor to ECC) to provide health and safety guidance and exposure assessment for workers at a debris collection site located at Religious and Orange Streets in New Orleans. The site was used as a point of collection and separation of debris. It was the designated point for small dump trucks to unload their material for separation where it could be picked up by larger trucks for distribution to landfills. Because of the smaller quantities of materials the smaller trucks brought (compared to other sites where large trucks were directed), workers were able to get a better sense of what types of materials were coming into the site and separated by type of material, making the site unique. A worker discovered that a load dumped

by a truck had contained a significant quantity of Transite™ siding shingles, a composite material that could potentially contain asbestos. Team 2 members were specifically asked to perform exposure monitoring for asbestos during the disposal activities of this material at the site (Summary C of the Appendix).

The site manager detailed the plan he developed to dispose of the approximately 2 yd^3 of Transite™ shingles that had been found. He planned to line a dumpster with plastic lining where the material was going to be placed. Initially, he planned to do the work by hand using a shovel. However, he instead directed a trackhoe operator to do the work mechanically. During the work, he wore a Tyvek® suit and an elastomeric half-mask respirator with P-100 cartridges, as did the trackhoe operator. Prior to moving the material into the lined dumpster, it was wetted down with water from a nearby water truck to minimize aerosolization of dust and/or fibers. Before the activity, Team 2 members placed sampling pumps on the trackhoe operator, the site manager, and another worker on-site, and placed a pump downwind to collect an area air sample. Sample results for fiber concentrations were non-detectable or very low. Although asbestos exposure was not identified during this assessment, conditions and materials may vary at other times and worksites. It was recommended that the employees be trained on hazards associated with handling siding and roofing materials, such as old Transite™ shingles, which may contain asbestos. It was recommended that they continue to assess the need for respirators as the debris composition and tasks vary. Respirator use should follow OSHA regulations even if voluntary use is allowed by management. A further recommendation was to continually use water sprays to minimize aerosolized dust.

Team 2 members accompanied auditors from FEMA to 22 locations (mainly debris collection sites) within Jefferson Parish to identify sites for possible follow-up personal/area air sampling and to disseminate worker safety and health information.

Clean-up and Salvaging Operations

Team 2 members provided technical assistance to the NPS regarding cleanup and salvaging operations at the Chalmette Battlefield and National Cemetery, both located in St. Bernard Parish. The Chalmette Battlefield and National Cemetery are located within a 200-acre property bordered by the Mississippi River to the south and an industrial park, including an oil refinery, to the east. Several buildings were damaged during Hurricane Katrina, including the superintendent's two-story house and the carriage house. Both structures had been inundated with approximately 5 feet of water and were under renovation. Many trees had fallen and had been consolidated and were being made into mulch for use on site. There was no oil damage at this site unlike that seen in adjacent residential and industrial Chalmette properties.

The NPS requestor informed Team 2 members that during the first couple of weeks following the hurricane, recovery workers had entered the superintendent's house to recover artifacts and were protected by knee-high rubber boots, coveralls, gloves, and half-mask air-purifying respirators. At the time of the visit, efforts were being made to ventilate the building and dry the contents through use of fans powered by a gasoline-powered outdoor generator. Additionally, natural ventilation was accomplished by opening all operable windows. The water-soaked carpet had not yet been removed from the house. Forest Service and NPS workers wore leather gloves while removing contents of the house; N-95 respirators were made available. Minimal to moderate levels of mold and mildew were visible only on the first floor, most notably on the carpet. A large tree had fallen on the carriage house, damaging the roof. The roofing shingles contained asbestos, and the majority of damaged shingles were in a pile near the corner of the building. Warning tape circled the perimeter of this area, thereby restricting access. Removal of the shingles was scheduled as soon as possible pending arrival of appropriate PPE. Team 2

members concurred with the approach and recommended high efficiency-filtered half-mask respirators, disposable coveralls, boot coverings, and gloves during clean up of the asbestos-containing material.

Disposal of Spoiled Food

Team 2 members observed workers emptying and cleaning freezers and refrigerators of spoiled food at a restaurant. The spoiled food included maggot-infested meat. Employees were wearing protective gear (Tyvek™ suits, gloves, half-face powered air purifying respirators) on a hot day. Therefore, heat stress was a potential health hazard for these employees. This was addressed by the site contractor's health and safety officer who provided employees with water, a tent with chairs for shade, and cooling fans.

Building Remediation and Repair

Team 2 members visited numerous sites, particularly hotels, throughout the Central Business District where workers were performing remediation/reconstruction activities to provide information and determine the need for further hazard assessment. The levels of remediation/reconstruction were site-dependent. It was observed that water damage and mold growth were issues in the locations visited. There was a large number of Hispanic workers (many of whom spoke little to no English) employed by the remediation and cleanup companies. Worker safety and health recommendations were provided where applicable.

Team 2 members were made aware of respiratory and dermal symptoms among contract workers at the U.S. Naval Air Station in Belle Chasse, Louisiana. Team 2 members collected air samples and performed noise monitoring on these workers actively involved in the repair of rooftops of four airplane hangars and a fire station damaged during Hurricane Katrina at the naval air station. Concerns were specifically expressed about potential fiberglass exposures during the removal of old rooftops. Sampling results and recommendations are provided in Summary D of the Appendix.

Animal Shelter

Team 2 members conducted noise monitoring at an outdoor animal shelter in St. Bernard Parish. The shelter was staffed by volunteers, some of whom stayed in trailers onsite. Team 2 members observed work practices and procedures and measured noise exposures on a veterinarian, a veterinarian assistant, and two veterinarian technicians for approximately 5 hours. The findings and recommendations from this site visit are summarized in Summary E of the Appendix.

Union Outreach

In an effort to reach out to unions whose members were likely to be conducting work in the hurricane-affected areas, union leaders were contacted to discuss ways in which the occupational health team members could provide assistance.

Team 2 members discussed their availability in New Orleans and offered their services in worker safety and health guidance and exposure assessment to the Local 406 (Baton Rouge) representative of the Operating Engineers Union whose members were mainly performing infrastructure repairs such as bridge and levee repairs. The representative said that the union was sending a national hazardous materials (HAZMAT) Team to New Orleans and said that he would pass Team 2 contact information onto this HAZMAT Team.

Team 2 members contacted a Paper, Allied-Industrial, Chemical and Energy (PACE)/Steel Workers/Chemical Workers Union leader and discussed their availability in New Orleans. The representative said none of his workers were involved in cleaning up the contaminated areas. His major concerns were about process safety issues in the chemical plants that were going to be restarting over the coming weeks and months.

Contact was made with Federal, state, and local leaders of the Communication Workers of

America (CWA). A conference call was held with two national representatives. They said that they had reviewed the protocol that BellSouth and Lucent sent them for sending people on a contract basis to the area to work. They agreed the protocols were comprehensive and properly included PPE and immunizations. The only issue the protocols did not address was training. The union leaders discussed this concern with the telephone companies who agreed to provide a training program for workers through the University of Alabama, Birmingham. The union leaders reported they had not heard of health problems and did not believe the companies were doing exposure monitoring. The union leaders were concerned that sludge/sediment was still inside and outside some locations where union members were working. The union leaders were concerned about subcontractors using immigrant labor and young workers. They asked us to keep them informed if Team 2 members found mold exposures in buildings where their installers may have been hooking up communication lines. Team 2 members also discussed their availability in New Orleans and offered their services in worker safety and health guidance and exposure assessment to the state representative of the CWA. He said that BellSouth was taking care of their safety issues. They provided HAZMAT Teams to inspect facilities before the union workers went into potentially contaminated areas. He reported few to no complaints from the local unions in regard to safety issues. The local representative said he felt that his members were getting enough support for occupational safety and health from the contractors for whom they were working, in particular BellSouth. BellSouth had brought in a safety supervisor and was helping ensure safety for the CWA members.

During a discussion with the regional representative of the Laborers Union, he reported that his members working with asbestos removal were trained on OSHA's Hazardous Waste Operations and Emergency Response Standard (HAZWOPER).[4] He relayed concerns about having to clean up fecal matter in the Superdome, but he had not heard of other concerns. He stated that the majority of the contractors were keeping a "close eye" on his members. A local representative said he had not heard of many health and safety issues for projects on which their members were working. However he knew of several problems that non-members were involved in. One was the "hit-and-miss attitude some worksites had in regards to PPE." That is, some workers were being provided certain PPE and others working side-by-side with them were not. There were sites where people were required to wear a half-mask respirator, but also required to eat and drink and take breaks in the same locations where they worked. He said he was not aware of any ongoing air monitoring.

Occupational Injury and Disease Surveillance

The medical officers on Team 2 advised local, state, and Federal officials of the potential health and occupational risks associated with working around the City of New Orleans. A site visit was conducted to the temporary NOPD HQ to meet with 35 District leaders to discuss occupational health risks from exposure to floodwaters, debris, and clean up.

To determine the prevalence of occupationally-related illness, injury, and stress, health hazard evaluations (HHEs) for both the NOPD and the New Orleans Fire Department (NOFD) were initiated. Final reports on these evaluations are available separately.[5,6]

Team 2 members collected the surveillance sheets for illness and injury previously distributed by Team 1 medical officers at the Greyhound Bus Depot. The forms were incomplete and not useful in assessing illness and injury rates.

Team 2 members developed and disseminated a single page information sheet for workers about NIOSH and the HHE program. The information sheet described the program and how to request assistance.

Occupational Health Team 3

Mission: Conduct follow-up of activities begun by the previous Teams, focusing on outreach to vulnerable occupational populations and information dissemination.

Occupational Health Team 3 was deployed to New Orleans between October 11 and October 29, 2005. It increased efforts at outreach and information dissemination among various communities and workforces. Team 3 members assisted in completing the NOPD and NOFD surveys mentioned previously.

Outreach in the Hispanic Community

Hispanic immigrant workers were a large source of labor for many of the sub-contractors working in the area. Team 3 members contacted various leaders in the area to investigate possible means of outreach to this Hispanic worker population. Contacts were made with a local Disaster Medical Assistance Team (DMAT), restaurant and supermarket owners, radio station owners, and Hispanic community leaders in Kenner and Gonzalez, Louisiana. Occupational safety and health information packages were then provided to these contacts for distribution to the Hispanic worker population. One Hispanic restaurant with a contract to provide Hispanic workers with noon and evening meals agreed with a request from Team 3 members to add a 1-page insert to each meal covering occupational safety and health issues such as respiratory protection, general hygiene, ladder safety, and prophylactic immunizations for cuts. Approximately 20,000 pieces of occupational safety and health literature was distributed to Hispanic workers.

Outreach in the Vietnamese Community

Team 3 members were joined by public health service officers from the Joint Field Office (JFO) in Baton Rouge, Louisiana to conduct public health/occupational safety and health outreach to a Vietnamese community in Northeast Orleans Parish. With the assistance of Vietnamese language skills provided by the JFO officers, contact was made with the pastor of Queen Mary Catholic Church, a Vietnamese congregation serving almost 3000 parishioners. Approximately 1200 pieces of Vietnamese-language public health/occupational safety and health literature from the CDC were left with the pastor for distribution among his parishioners. In addition, a need for immunization and medical support for the Vietnamese community was identified by the pastor and was pursued by the JFO members of the team. The combined team also identified a Buddhist temple badly damaged by the hurricane. Although devotees had reportedly not returned to the area, successful telephone contacts with temple leaders were established to distribute Vietnamese-language occupational safety and health literature to devotees.

Outreach to Health Care and Emergency Services Personnel

A Team 3 member was the keynote speaker at an Ochsner Clinic Health Fair in New Orleans. The presentation included general information about respirator use and other types of personal protection. The second speaker was a representative of the 3M Company, which provided cleaning kits (including three N-95 respirators, hand disinfectant, sponge, and wound protector) to the attendees. The presentations were available by videoconference to two other Ochsner facilities.

Team 3 members also provided educational materials to the staff at the Red Cross/FEMA tent. Remaining educational materials were given to the Billy Graham Disaster Team who promised to distribute the information to people working in their houses.

Outreach at Job Fairs

Over the course of two days, Team 3 members reached out to 24 employers and about 100 prospective employees at a local job fair in St. Bernard Parish. Team 3 members provided information on worker health and safety for residents returning home and demonstrated the correct way of donning respirators and how to choose the right type of respirator. Team 3

members also met the director of homeland security and emergency preparedness for St. Bernard Parish who noted that they did not have respirators for returning residents and that all resources they requested were being diverted to New Orleans. Returning residents also complained of lack of access to respirators and lack of information on potential hazards and the types of PPE needed.

Mold Remediation

A site visit was conducted by Team 3 members at the St. Bernard's Parish Courthouse in Chalmette, Louisiana in response to concerns about mold remediation efforts. The members discussed the status of these efforts and future plans with the Project Manager for Advanced Cleanup Technology, Inc. and conducted a walk-through tour of the courthouse and an adjacent building. They discussed recommendations for employee training and their use of personal protective equipment and why environmental sampling was not recommended (Summary F in the Appendix).

Asbestos

Team 3 members were contacted regarding concerns about dust (possibly containing asbestos) and dried flood sediment levels in a Red Cross warehouse. Reportedly, one of the workers recently had seen a physician because of respiratory irritation possibly associated with working at the warehouse; reportedly, the physician told him that he had asbestosis. Team 3 members were asked if there was evidence of asbestos in the warehouse, if it was possible that this worker developed asbestosis if he only worked in this warehouse for several days, and if air samples for asbestos should be collected in the warehouse.

A visual inspection was conducted at the warehouse for potential asbestos-containing materials. Team 3 members found no source materials that would suggest workers were potentially exposed to asbestos at the worksite. No fire retardant materials were observed that could be a source of asbestos (the ceiling was exposed plywood). Pipes hanging from the ceiling and along the warehouse walls were not insulated. Furthermore, the walls throughout the warehouse were cement. Debris piles from roof demolition appeared to contain wood debris, asphalt/fiberglass roofing material, and dirt. Additionally, the building owner/operator reported the building did not contain asbestos. Because there were no observable sources of asbestos during our walk-through inspection of the building, it was determined there was no justification to sample the air for asbestos.

Information was provided on the chronic, slowly progressive nature of asbestosis, seen most often in workers who manufacture or use asbestos products and who have been exposed to high levels of asbestos. Team 3 members described how asbestosis is not a condition that develops over the course of several days, but rather that the first signs of disease can be 15–30 years after the exposure.

Ongoing repair of the warehouse roof was observed. The work area in the warehouse was dusty during the site visit and could potentially cause respiratory irritation. It was reported that dust masks were offered to the workers but they chose not to wear them. Team 3 members were uncertain of the exact type of respirators offered. However, because the remaining supplies still needed to be removed from the building requiring workers to return to the warehouse, recommendations to minimize dust exposure were provided. These included wet mopping, rather than dry sweeping the floor prior to removal of supplies, accessing the supplies from the back dock rather than entering the larger area of the warehouse where the roof repair work was being performed; using a battery-powered pallet jack or hand pallet jack to move the supplies because the exhaust from a motorized fork lift may disturb any dust present on the floor; and using a damp cloth to wipe the dust from the supplies rather than using compressed air.

Louisiana Department of Health and Hospitals Team

CDC/NIOSH occupational health specialists assisted the Louisiana Department of Health and

Hospitals (LDHH) regarding worker health, safety, and exposure issues. The initial CDC/NIOSH team for the LDHH, Louisiana Office of Public Health, Environmental Epidemiology & Toxicology (EE&T) consisted of an administrative assistant, public health advisor, health educator, occupational health physician, and industrial hygienist. Subsequent CDC teams included occupational and environmental health support from the Agency for Toxic Substances and Diseases Registry (ATSDR) and NIOSH. The purpose of the teams were to provide technical support to the LDHH employees in the EE&T office, which was responsible for the toll-free number relating to environmental health issues, health issues dealing with hazardous exposures (including the Superfund sites in New Orleans), and indoor environmental quality. The team attended daily JFO and State EPA meetings to gather information for the state health representative; set-up communication on a daily basis with the environmental team in New Orleans; and review environmental health data on sludge, air, and water contamination in New Orleans and for Lake Pontchartrain. The team developed information handouts on safe entry and mold and helped get the pamphlets printed and taken to New Orleans for distribution with help from the CDC Foundation. Other tasks included answering public inquires, supporting state officials with policy statements dealing with mold exposures and PPE.

CONCLUSIONS

During the time spent in the New Orleans area in the aftermath of Hurricane Katrina, several themes emerged regarding occupational health and safety of response, rescue, and recovery workers. One was the recognition that, while the devastation in New Orleans may have been on a much larger scale than previous hurricanes and floods, many of the issues faced were, in fact, similar to past incidences of flooding elsewhere. In particular, concerns regarding health effects due to mold exposures in flooded homes and businesses were commonly brought to the attention of Occupational Health Team members. In addition to mold, concerns of exposures to harmful chemical and biological agents were abundant. The importance of information readily accessible and understandable by the workers and the public regarding these issues was apparent throughout the response.

While environmental sampling by Occupational Health Team members typically did not reveal contaminant levels above recognized occupational exposure limits (see Appendix for summaries of results from individual sites), the ability and capacity of employers and employees to recognize and evaluate these hazards was quite variable. The USACE major contractors and subcontractors with whom the Occupational Health Team members met had varying degrees of capacity for hazard recognition, evaluation, and control. It is imperative to develop the capacity of contractors to safeguard the safety and health of their workers prior to such work so that they can successfully implement effective programs during often chaotic disaster conditions.

Occupational safety hazards were evident during hurricane cleanup and recovery activities. The unions, in particular, expressed concerns over unaddressed safety issues to Occupational Health Team members. Oftentimes, it appeared that safety violations were committed in the rush of contractors to do as much work as possible in the shortest amount of time. This included common violations such as overloading trucks and hauling debris without tarps so that large chunks of debris (entire mattresses, dressers, large pieces of metal) fell from the trucks; traveling too fast at or near debris dump sites; and lack of professional safety staff and other resources on site. For example, a day after a visit to a debris transfer/dump site by Occupational Health Team members where safety hazards were evident, a flagman was killed after being trapped under the left track of a bulldozer. OSHA and USACE conducted investigations of the fatality. This example shows the need for qualified safety professionals as a key component of companies' occupational health program for work in disaster areas.

Cooperation between occupational safety and health staff of the various governmental agencies involved (i.e., OSHA, NIOSH, USACE) and the main contractor/subcontractors is essential for future emergencies. The Worker Safety and Health Annex of the Emergency Support Function 8 (ESF-8), which is in the National Response Plan, was put into effect for the first time during Hurricane Katrina. This annex describes the responsibilities OSHA has to provide assistance to Federal employees and their contractors during disaster recovery operations, as well as the support role NIOSH plays to OSHA during such a response. Occupational Health Team members developed relationships with OSHA counterparts in New Orleans, as well as with safety and health staff among the main contractors to the USACE. Building on these relationships and making changes in response to lessons learned will be important for enhancing Federal response efforts in the future.

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TABLE

Table 1
Health complaints or diagnoses occurring five or more times in the 150 employees of a private security company working in New Orleans following Hurricane Katrina (September 3–27, 2005)

Diagnosis or Presenting Complaint	Number Seen for This Reason (% out of 267 total clinic visits)
Laceration (Fingers/Hand)	37 (14.0)
Sinus Congestion	27 (10.0)
Emotional Distress	25 (9.3)
Insect Bites/Sting	21 (7.8)
Laceration (All Other)	17 (6.3)
Headache	15 (5.6)
Nausea	10 (3.7)
Heat Exhaustion	9 (3.3)
Eye Irritation	8 (3.0)
Abrasion	8 (3.0)
Diarrhea	7 (2.6)
Skin Rash	7 (2.6)
Dehydration	7 (2.6)
Blisters (Feet)	7 (2.6)
Sore Throat	6 (2.2)
Excessive Noise Exposure	6 (2.2)
Fatigue	5 (1.9)

Appendix

Summaries of Individual Sites Evaluated

CDC/NIOSH Hurricane Katrina Response - A

CERES Environmental/Beverly Construction Airport Debris Site, New Orleans, Louisiana

Investigators from the National Institute for Occupational Safety and Health (NIOSH) evaluated job hazards on October 3 and 5, 2005, at the Ceres Environmental/Beverly Construction Airport Debris Site.

What NIOSH Did

- We watched work processes and practices.
- We took three personal breathing zone (PBZ) air samples for total dust and metals, eight PBZ air samples for respirable dust and silica, seven PBZ air samples for asbestos and other fibers and one bulk sample of the debris pile for metals, silica, and asbestos.
- We measured noise exposures on a bulldozer operator, a team leader who was passing out tickets to trucks, and a backhoe operator.

What NIOSH Found

- PBZ samples for total dust were below the Occupational Safety and Health Administration (OSHA) permissible exposure limit (PEL).
- Lead, arsenic, and manganese concentrations were very low or nondetectable.
- PBZ samples for respirable dust were below the OSHA PEL. Two of the samples contained levels of quartz below the OSHA PEL. None of the samples contained cristobalite.
- PBZ samples for fibers were below the OSHA PEL for asbestos. The types of fibers identified were mainly cellulose/plant fibers and fiberglass.
- Low levels of metals such as manganese, lead, and arsenic, were found in the bulk sample.
- The bulk sample contained 12% quartz; asbestos was not detected.
- Noise exposures for the team leader exceeded the NIOSH Recommended Exposure Limit (REL) dose of 100%. The REL dose for the backhoe operator was 98.5%. Exposures for both were below the OSHA criteria. Results are not available for the bulldozer operator due to equipment malfunction.

Recommendations

- Enforce traffic rules on the site.
- Restrict flagmen from the dumping area.
- Provide sanitary facilities for hand washing.
- Provide an area (for example, a tent) for employees to change into and out of protective clothing. Ideally, a shower facility should be available.
- Make hearing protection devices such as ear plugs available to the workers and enforce their use.
- Use barriers (e.g., steel posts set in concrete) to help protect the USACE personnel who work near moving trucks.
- Use water sprays regularly to reduce airborne dust levels.
- Continue to assess the need for respirators as the debris composition and tasks vary. Respirator use should follow OSHA regulations even if voluntary use is allowed.

What To Do For More Information:
For more information about the sampling done on this site visit, contact NIOSH at (513)-841-4382 and ask for Hurricane Katrina Response Support

CDC/NIOSH Hurricane Katrina Response - B

North Galvez and St. Louis Streets Debris Site, New Orleans, Louisiana

On October 4, 2005, investigators from the National Institute for Occupational Safety and Health (NIOSH) evaluated job hazards at a debris site located on North Galvez Street in New Orleans, Louisiana. At this site, green debris (branches, trees shrubs, etc.) were compiled and mulched for transport to landfills or burning sites. Workers at this site were employees of ECC, a contractor to the US Army Corps of Engineers.

What NIOSH Did

- We watched work processes and practices.
- We took one personal breathing zone (PBZ) and three area air samples for total dust and metals.
- We took two area air samples for respirable dust and silica.
- We took two bulk samples of the soil to screen for metals, crystalline silica, and asbestos.
- We measured noise exposures on a quality control (QC) inspector and a trackhoe operator/foreman.
- We discussed recommendations for employee training and their use of personal protective equipment.

What NIOSH Found

- Workers were required to wear hard hats, breathable coveralls, and N-95 filtering facepiece respirators.
- Total dust concentration was below the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL).
- Airborne lead, arsenic, and manganese concentrations were very low or nondetectable.
- Respirable dust concentrations were below the OSHA PEL.
- Neither of the respirable dust samples contained silica (quartz or cristobalite).
- Low levels of metals such as manganese, lead and arsenic were found in the bulk samples.
- Neither of the bulk samples contained asbestos.
- Both bulk samples contained crystalline silica (quartz).
- Noise exposures on the QC inspector and the trackhoe operator/foreman were below all exposure criteria for the time sampled.

Recommendations

- Continue to use hard hats, breathable coveralls, and safety glasses.
- Continue to assess the need for respirators as the debris composition and tasks vary. Respirator use should follow OSHA regulations even if management allows voluntary use.

What To Do For More Information:
For more information about the sampling done on this site visit, contact NIOSH at (513)-841-4382 and ask for Hurricane Katrina Response Support

CDC/NIOSH Hurricane Katrina Response - C

Religious and Broad Streets Debris Site,

New Orleans, Louisiana

On October 10, 2005, investigators from the National Institute for Occupational Safety and Health (NIOSH) assessed potential job hazards at a debris site located at Religious and Broad Streets in New Orleans, Louisiana. The site was run through a subcontract of ECC. Investigators conducted air sampling on personnel actively involved in the disposal of a pile of suspected Transite™ material found among debris from Hurricane Katrina. Concerns were specifically expressed about potential asbestos fiber exposures during this activity. Transite™ is a fire-proofing material used in roofing and siding that used to be made with asbestos; modern-day Transite™ is not made with asbestos.

What NIOSH Did

- We watched work practices and procedures.
- We took three personal breathing zone (PBZ) air samples and one area air sample for asbestos and other fibers during the transfer of the suspected Transite™ material to a lined dumpster.

What NIOSH Found

- The fiber concentration on the area air sample was below the limit of detection.
- The fiber concentrations on two of the three PBZ samples were non-detectable. The third PBZ sample, taken on a trackhoe operator, had a very low fiber concentration.
- The fibers identified were cellulose, not asbestos fibers.

Recommendations

- Although asbestos exposure was not identified during this assessment, conditions and materials may vary at other times and worksites. Train employees on the hazards associated with handling siding and roofing materials, such as old Transite™, which may contain asbestos.
- Use water sprays to suppress dust.
- Avoid crushing, grinding, or breaking old Transite™ or other materials that may contain asbestos to prevent fibers from becoming airborne.
- Continue to assess the need for respirators as the debris composition and tasks vary. Respirator use should follow OSHA regulations even if management allows voluntary use.

What To Do For More Information:

For more information about the sampling done at this site visit, contact NIOSH at (513) 841-4382 and ask for Hurricane Katrina response support.

CDC/NIOSH Hurricane Katrina Response - D

Assessment of Occupational Hazards at a U.S. Naval Air Station, Belle Chasse, Louisiana

Investigators from the National Institute for Occupational Safety and Health (NIOSH) evaluated job hazards on October 9 and 10, 2005, at a U.S. Naval Air Station in Belle Chasse, Louisiana. The workers were employed by the Young Group.

What NIOSH Did

- We watched work processes and practices.
- Took three personal breathing zone (PBZ) air samples for fiberglass, nine PBZ air samples for total dust, and two bulk samples of old roofing material and roof debris for asbestos.
- We measured noise exposures on a forklift operator and four roofers.

What NIOSH Found

- Fiberglass concentrations were very low or nondetectable.
- Total dust concentrations were below the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL).
- Asbestos was not detected in the bulk samples.
- Noise exposures for the forklift operator exceeded the NIOSH Recommended Exposure Limit (REL) dose of 100%. The REL doses for the roofers were below 100%. All noise measurements were below OSHA criteria.

Recommendations

- Continue to wear hard hats when working on the roof.
- Continue to drink fluids regularly to stay hydrated.
- Wear long sleeve shirts and safety glasses when tearing up old roofs.
- Take a shower at the end of the day.
- Do not smoke in the workplace.
- Enforce use of hearing protectors for the forklift operator; reevaluate noise exposures on roofers when the work rate increases or when roof surfaces are different from those evaluated.
- Continue to assess the need for respirators as the intensity of tasks increases. Respirator use should follow OSHA regulations even if management allows voluntary use.

What To Do For More Information:

For more information about the sampling done on this site visit, contact NIOSH at (513)-841-4382 and ask for Hurricane Katrina Response Support.

CDC/NIOSH Hurricane Katrina Response - E

Evaluation of Noise Exposures at an Animal Shelter, St. Bernard Parish, Louisiana

Investigators from the National Institute for Occupational Safety and Health (NIOSH) conducted noise monitoring at an outdoor animal shelter in St. Bernard Parish. The shelter was staffed by volunteers, some of whom stayed in trailers onsite. Monitoring was carried out on October 3 and 4, 2005.

What NIOSH Did

- We observed work practices and procedures.
- We took nine instantaneous readings of noise levels at the dog tent.
- We measured noise exposures on a veterinarian, a veterinarian assistant, and two veterinary technicians for approximately 5 hours.
- Personal exposures are expressed as a dose percent, where the maximum allowable dose is 100%.
- The doses are expressed as NIOSH Recommended Exposure Limit (REL) and the OSHA Action Level (AL). The NIOSH REL is based on a 3-decibel (dB) exchange rate, and the OSHA criteria are based on a 5-dB exchange rate. The NIOSH REL is more conservative than the OSHA criteria.

What NIOSH Found

- The noise levels at the dog tent ranged from 90–96 dB on an A-weighted scale.
- The veterinarian had a dose of 128% as calculated by the REL and a dose of 36% as calculated by the AL for the time sampled.
- The veterinary assistant had a dose of 136% as calculated by the REL and 36% as calculated by the AL for the time sampled.
- The two technicians had doses of 199% and 337% respectively, as calculated by the REL, and a corresponding dose of 42% and 63%, as calculated by the AL.
- The noise exposure on one of the technicians exceeded the OSHA Action Level of 50% dose, which would require workers to be placed in a hearing conservation program (HCP).

Recommendations

- Provide volunteers with hearing protectors when working with dogs.
- Enroll volunteers who regularly conduct similar activities, in an HCP as specified by OSHA (29 CFR [Code of Federal Regulations] 1910.95).

What To Do For More Information:
For more information about the sampling done on this site visit, contact NIOSH at (513) 841-4382 and ask for Hurricane Katrina Response Support.

CDC/NIOSH Hurricane Katrina Response - F

Evaluation of the St. Bernard Parish Courthouse

On October 13, 2005, a site visit was conducted by investigators from the National Institute for Occupational Safety and Health (NIOSH) at the St. Bernard's Parish Courthouse in Chalmette, Louisiana. Investigators discussed the status of current remediation efforts and future plans with the Project Manager for Advanced Cleanup Technology, Inc. and conducted a walk-through tour of the courthouse and an adjacent building. No environmental sampling was conducted.

What NIOSH Did

- We conducted a walk-through tour of the facility.
- We discussed recommendations for employee training and their use of personal protective equipment.
- We discussed why environmental sampling was not recommended.
- We checked portions of the false ceiling, pipe chase, and ventilation systems for mold contamination and flood residue.
- We provided recommendations regarding cleanup activities.

What NIOSH Found

- Remediation and cleaning procedures for courthouse rooms with non-porous surfaces appeared to be progressing appropriately and effectively.
- Remediation efforts for porous surfaces were in the beginning stages.
- Courtrooms utilizing raised sub-floors for elevated seating were not disassembled during initial remediation efforts.
- Cleaning within pipe chase and electrical closets may require special precautions regarding de-energizing electrical panels and confined space entry requirements for pipe chase areas.
- Rooms with significant paper, carpet, pressboard furniture, and similar furnishings showed significant mold growth.
- Some "cleaned" rooms showed persistent or new mold growth along fibrous ceiling tiles, or on furniture and storage items.
- Some content removal activities attributed to work by Army National Guard personnel was consistent with that of mold remediation activities.
- Portions of some heating, refrigerating, and air conditioning systems showed signs of internal contamination and subsequent spore redistribution.

Recommendations

- Ensure all workers involved in mold remediation activities have received sufficient training to understand the hazards presented by the mold, the cleaning agents, and the remediation processes.
- Ensure that all workers involved in mold remediation are equipped with appropriate personal protective equipment (skin, eye, respiratory protection).
- Follow OSHA requirements for use of respirators, including fit-testing, medical clearance and establishing a written respiratory protection program.
- Remove all porous items (paper, drywall, carpeting/carpet padding, upholstery, wallpaper, ceiling tiles, insulation material, some clothing, leather, paper, wood) that are contaminated or have been wet for more than 48 hours.
- Porous items should not be returned to building unless they can be thoroughly cleaned and dried.
- Courtrooms with raised sub-floor areas should be partially disassembled and evaluated for remediation options.
- Remediate and clean the heating, ventilation, and air conditioning systems prior to re-occupancy.
- Provide an area (for example, a tent) for employees to change into and out of protective clothing. Ideally, a shower facility should be available.

What To Do For More Information:

For more information about the sampling done on this site visit, contact NIOSH at (513) 841-4382 and ask for Hurricane Katrina Response Support.

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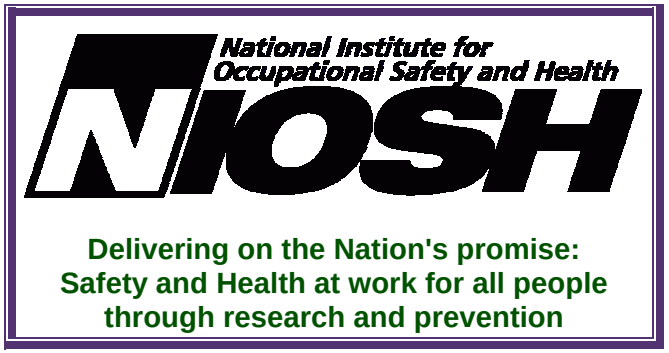

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