

NIEHS Worker Education and Training Program (NIEHS WETP)



Annual Report (August 1, 2006 - July 31, 2007)

On the Inside

- NIEHS WETP Background Information.....page 2
- Program Areas.....page 2
- Training Consortia.....page 3
- Strategic Plan 2008-2013.....page 4
- Gold Standard Safety and Health Training.....page 5
- Report on the 2007 National Trainers Exchange.....page 6
- Report on the 2007 APHIS/NIEHS Avian Influenza Conference.....page 7
- NIEHS WETP National Clearinghousepage 8
- Hazardous Waste Worker Training Highlights.....pages 9–17
- Minority Worker Training Summary.....pages 18–21
- HazMat Disaster Preparedness Training Summary.....pages 22-23
- Advanced Training Technologies Program Summary.....pages 24-26
- Hazardous Waste Worker Training Program Charts.....pages 27–30
- Minority Worker Training Program Chartspages 31– 34

Vision

“To provide model safety and health training and education to those who work with and clean up hazardous materials, and for those who respond to emergencies involving hazardous substances. This model safety and health training is designed to protect these workers, and the communities in which they work, from injury and illness.”

From the NIEHS WETP 2008 Strategic Plan



Background Information

The National Institute of Environmental Health Sciences Worker Education and Training Program (NIEHS WETP) was given major responsibility for initiating a training grants program under the Superfund Amendments and Reauthorization Act of 1986 (SARA).

The primary objective of this program is to fund non-profit organizations with a demonstrated track record of providing high quality occupational safety and health training to workers who are involved in handling hazardous materials or in responding to emergency releases of hazardous materials.

These are covered by the Occupational Safety and Health Administration's (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) standard (CFR 1910.120).

Since the initiation of the NIEHS WETP in 1987, the program has developed a strong network of non-profit organizations that are committed to protecting workers and their communities by delivering this training to target populations of hazardous waste workers and emergency responders.

Since 1987, nearly two million workers have received NIEHS WETP supported safety and health training. This includes training under five NIEHS WETP training programs: Hazardous Waste Worker Training Program, Department of Energy/NIEHS Nuclear Worker Training Program, Brownfields and Minority Worker Training Programs, and the Hazmat Disaster Preparedness Training Program.

More information on the NIEHS WETP can be found on the Internet at www.niehs.nih.gov/wetp.

Program Areas

The NIEHS WETP funds training through competitively awarded cooperative agreements. The recipients are non-profit organizations with demonstrated access to appropriate worker populations and experience in implementing and operating worker health and safety education training programs. The training awards are divided into a number of program areas including:

Hazardous Waste Worker Training Program (HWWTP) – Provides model occupational safety and health training for workers who are or may be engaged in activities related to hazardous waste removal or containment or chemical emergency response. Seventeen of the primary awardee consortia are funded for this program.

Hazmat Disaster Preparedness Training Program (HDPTP) - This new program is to enhance the safety and health training of current hazardous materials workers and chemical responders, to train skilled response personnel, to create materials and deliver training to weapons of mass destruction response workers and to augment prevention and preparedness efforts in a wide variety of high risk settings.

Minority Worker Training Program (MWTP) – Focuses on delivering comprehensive training to disadvantaged urban youth in order to prepare them for employment in the construction and environmental cleanup fields. One of the primary consortia (Dillard University) is funded entirely under this program.

Brownfields Minority Worker Training Program (BMWTP) - Broadens the MWT Program to provide comprehensive training to disadvantaged residents and to foster economic and environmental restoration to communities impacted by Brownfields. *A separate report on this program is issued annually.*

Department of Energy/NIEHS Nuclear Worker Training Program (DOE/NIEHS NWTP) - This program is focused on training workers engaged in environmental restoration, waste treatment and emergency response activities at sites in the Department of Energy's nuclear weapons complex. *A separate report on this program is issued annually.*

Advanced Training Technology Program (ATT) - This program focuses on the development of Advanced Technology Training (ATT) products for health and safety training of hazardous materials workers, emergency responders, and skilled support personnel. This includes the Small Business Innovative Research program.



Western Region Universities Consortium

UCLA Labor Occupational Safety and Health Program•University of California at Berkeley Labor Occupational Health Program•University of California Davis Extension•Arizona State University•University of Washington/Northwest Center for Occupational Health and Safety

International Association of Firefighters

New York/New Jersey Hazardous Materials Worker Training Center

University of Medicine and Dentistry of New Jersey•Hunter College, School of Health Sciences•New York Committee for Occupational Safety and Health • New Jersey State Police•University at Buffalo•New York Carpenters Labor Technical College•Universidad Metropolitana

International Union of Operating Engineers

International Union of Operating Engineers•ATL, Inc. •West Virginia University Safety and Health Extension

United Steelworkers of America

United Steelworkers of America•The Labor Institute•University of Massachusetts, Lowell•Northeast Resource Center

The International Brotherhood of Teamsters/National Labor College

The New England Consortium

University of Massachusetts, Lowell•Massachusetts Coalition for Occupational Safety & Health•Connecticut Council on Occupational Safety & Health•Rhode Island Committee on Occupational Safety & Health•Western Massachusetts Coalition for Occupational Safety & Health•New Hampshire Coalition for Occupational Safety & Health

International Chemical Workers Union Center for Worker Health & Safety Education

International Chemical Workers Union Center for Worker Health & Safety Education•University of Cincinnati•Greater Cincinnati Occupational Health Center•International Association of Machinists & Aerospace Workers•Coalition of Black Trade Unionists•United Food & Commercial Workers International Union • American Federation of Teachers•International Chemical Workers Union•American Federation of Government Employees•American Nurses Association

Midwest Consortium for Hazardous Waste Workers Training

University of Cincinnati•Southeast Michigan Coalition on Occupational Safety & Health•Greater Cincinnati Occupational Health Center•University of Illinois•University of Kentucky•Michigan State University•University of Tennessee•University of Minnesota•University of Louisville•Lakeshore Technical College•Ohio Environmental Council •Citizens for Environmental Justice •Detroiters Working for Environmental Justice •The Three Affiliated Tribes•Fisk University - Environmental Justice Program•Environmental Management Institute

University of Alabama Birmingham

University of Alabama Birmingham•Communications Workers of America•Native American Fish and Wildlife Society

Laborers/Associated General Contractors Education and Training Fund

Service Employees International Union, AFL-CIO

Service Employees International Union, AFL-CIO•The League/1199SEIU Training & Upgrading Fund in New York•SEIU Local 1199NY and SEIU United Health Care Workers West's Shirley Ware Education Center

International Union, United Auto Workers

International Union, United Auto Workers•University of Michigan

Center for Construction Research and Training—CPWR

Center for Construction Research and Training (formerly Center to Protect Workers Rights) •International Association of Heat & Frost Insulators and Asbestos Workers•International Union of Painters•Plasterers and Cement Masons International Association•United Union of Roofers•International Brotherhood of Boilermakers•Cypress Mandela / WIST Center•Louisiana Regional Council of Carpenters•Opportunities Industrialization Center West•United Brotherhood of Carpenters•Merrick Community Services, Inc. •International Brotherhood of Electrical Workers•United Association of Plumbers & Pipe Fitters•Louisiana Regional Council of Carpenters•Los Angeles Conservation Corps•International Union of Bricklayers•Sheet Metal Workers International Association•International Brotherhood of Teamsters•JFY Net-Works•International Union of Operating Engineers•International Union of Elevator Constructors•International Association of Iron Workers•Laborers' International Union of North America

Hazardous Materials Training & Research Institute

Hazardous Materials Training & Research Institute•Kirkwood Community College•Community College Consortium for Health and Safety Training•University of Tennessee•St. Louis Community College•El Paso Community College

OAI, Inc.

OAI, Inc. • Maine Labor Group on Health•Make Ready, Inc. •Wheeler Creek Community Development Corporation

AFSCME Training and Education Institute

AFSCME Training and Education Institute•University of Massachusetts, Lowell•Coalition of Black Trade Unionists

Dillard University

Dillard University•Clark Atlanta University•Southern University in Baton Rouge•Center for Environmental and Economic Justice•Citizens for Environmental Justice

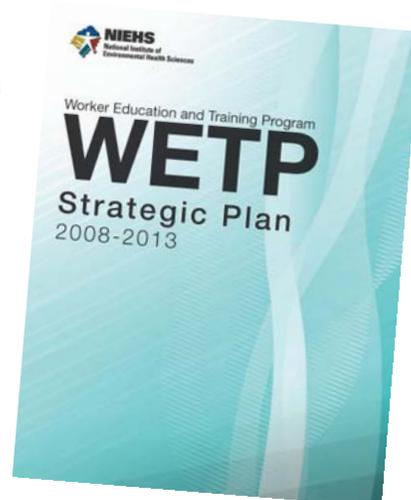
Strategic Plan 2008—2013

In February 2007, the staffs of the WETP and the National Clearinghouse began the process of reviewing and updating, as necessary, the WETP Strategic Plan published in 2002. The WETP developed this strategic plan to be consistent with the NIEHS vision, which includes identification and prevention of hazardous exposures. The WETP uses the environmental sciences to reduce risk and protect worker and public health through training. As was the case in developing the initial NIEHS WETP Strategic Plan, stakeholder inclusion from awardees, other Federal agencies, and Champions of the Program was a central part of the process.

To achieve this, key issues were identified and shared with the Clearinghouse Advisory Board in March 2007. In March 2007, at the National Trainers' Exchange, the WETP used a group activity during a plenary session to obtain input from the attendees on the program's direction for the next five years. The WETP staff also participated in many of the Awardees' Advisory Board meetings in an effort to inform Advisory Board members of this effort, and to gather their thoughts as to where the program should be headed.

A Champions' meeting was held on September 25, 2007 to gain input from those outside the organization, but familiar with the program. These champions included individuals with expertise in occupational health and safety and knowledge of the WETP. The meeting primarily focused on the strategic issues facing the program, giving rise to discussions about several topics, including the need to: expand the program; continue developing partnerships with a variety of organizations; give minority populations more access to information; continue to integrate advanced training technologies into the training; and demonstrate the importance of the WETP's work in the national emergency response arena.

This process also concluded that the WETP Core Program rests on the recognition in the environmental response and cleanup community that worker protection is dependent on the compliance by contractors and governmental agencies with the provisions of 29 CFR 1910.120. That is, whether traditional superfund sites, uncontrolled hazardous waste sites, or sites emanating from a natural disaster or an act of terrorism, the components of worker protection do not change.



Finally, the WETP Awardee Meeting and Workshop, *The Future of Hazardous Materials Cleanup and Training*, was held October 17-19, 2007 in Chapel Hill, NC. This meeting allowed the WETP to present key priorities and solicit final input into the strategic plan. The strategic plan owes its insights and direction, in large part, to the hard work of the WETP staff, the awardees who provided input and feedback, and the program's champions.

For a PDF copy of the 2008-2013 WETP Strategic Plan, go to WETP Strategic Plan (http://www.niehs.nih.gov/wetp_strategic_plan.pdf)

NIEHS WETP STRATEGIC PRIORITIES

Mission Priorities

1. Continually seek and encourage opportunities to collaborate with organizations (at all levels) that share the common goal of protecting workers and their communities.
2. Advocate for the health and safety of emergency responders and skilled support personnel through actively participating in all phases of the national response to disasters.
3. Oversee and manage the expansion of a national network of trainers with diverse specific skills grounded on a common training doctrine. These trainers will become a national resource for providing health and safety education and will prepare responders to perform their duties in a hazardous environment.
4. Expand opportunities for minority and underserved populations in cities and surrounding communities by providing life skills, construction, and career training in the handling and remediation of hazardous materials.
5. Leverage and actively integrate technology and innovation to improve the delivery of education and training to workers performing duties in a hazardous environment.

Organizational Priorities

1. Foster more awardee partnership activities.
2. Institutionalize the WETP in awardee organizations by capturing program history and maintaining strong leadership development programs.



Gold Standard Training

Minimum Criteria for Health and Safety Training for Hazardous Waste Operations and Emergency Response

“Gold Standard” worker safety and health training saves lives. This has been the experience of the Worker Education and Training Program of the National Institute of Environmental Health Sciences, which has trained nearly two million workers since its beginning in 1987. Its mandate came through the Superfund Amendments and Reauthorization Act of 1986, which also required OSHA to promulgate health and safety standards to protect and train workers engaged in hazardous waste operations. OSHA promulgated a final standard in March 1990 at 29 CFR 1910.120. The Act also established and funded a grants program for the training and education of workers engaged in work covered by that OSHA standard.

From the first, the intent of the training grants program was to develop and deliver the highest quality training programs geared to the adult learner. But what is the highest quality training?

To answer this question and to assist in the evaluation of training programs, WETP developed, through a participatory national process, the “Minimum Criteria for Health and Safety Training for Hazardous Waste Operations and Emergency Response”. Referred to as the “Minimum Criteria”, they are the basis for creating the highest quality training - gold standard training. Since their development in 1991, they have been periodically reviewed and updated, most recently in 2006. Specifically, the Minimum Criteria emphasize principles of adult education, establish minimum criteria for designing training program, establish quality control requirements for training programs, and provide generic guidelines for training curriculum.

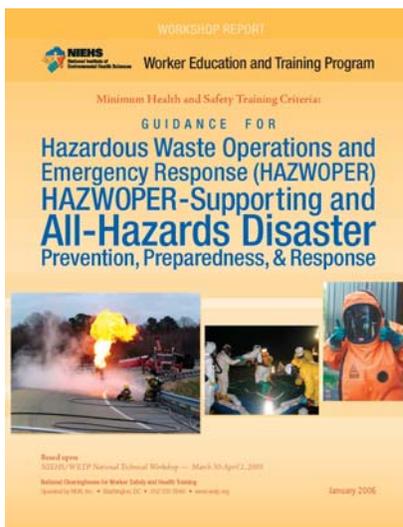


Left Photograph: Utilizing advanced training technologies at Lakeshore Technical College, Midwest Consortium.

Guiding Principles

The following are broad, overarching principles that frame the more detailed guidance in this document.

1. 29 CFR 1910.120 provides the needed framework for protecting hazardous waste workers and emergency responders. It is the most proactive OSHA standard for protecting workers who respond to disasters, both natural and manmade. In the latter category, OSHA has indicated that terrorist acts involving chemical, biological, radiological, and nuclear weapons would be covered by the standard. Acts involving explosive agents may also be covered, depending on the types of exposures generated by the acts.
2. This guidance is primarily intended for organizations that provide hazardous waste worker and emergency response training under grants from NIEHS, but may likewise prove valuable to any organization that provides similar occupational health and safety training.
3. This document draws upon and references other guidance materials that provide excellent recommendations for training the intended target populations. Of particular note are the National Fire Protection Association guidelines and the FEMA “Guidelines for Haz Mat/WMD Response, Planning and Prevention Training: Guidance for Hazardous Materials Emergency Preparedness (HMEP)”, April 2003 Edition. The FEMA guidance has been fully adopted by reference in this document.
4. Whenever there is doubt about the appropriate category of training, the more comprehensive and protective should be applied.
5. Peer-to-peer training with hands-on activities is the most effective model for worker training. This guidance recommends that hands-on training should fill at least one-third of the training program hours.
6. Computer-based training methods can greatly augment the effectiveness and reduce the cost of hazardous waste worker training, but should not be the sole form of training when workers’ health and safety are at risk especially with respect to skills training.
7. Proven adult-learning techniques should be the core of all worker training.
8. Worker safety and health training must be preceded by a needs analysis to ensure the appropriate knowledge, skills and attitudes are being transmitted. The training must be followed by a proper evaluation to document the knowledge, skills or attitudes were acceptably transmitted and that the worker possesses the necessary abilities to perform the tasks.
9. Post-disaster training must be tailored to the specific hazards presented by each disaster and should be revised as often as significant new hazard information becomes available or the stage of the disaster changes.



2007 National Trainers Exchange



Sharon Beard, Program Administrator, NIEHS WETP

The fifth NIEHS National Awardee Meeting and Trainers' Exchange: Looking Back and Moving Forward: 20 Years of Worker Education and Training was held March 28-30, 2007 at the Flamingo Las Vegas Hotel in Las Vegas, Nevada.

The National Trainers' Exchange brought together over 200 trainers from all WETP awardee organizations to meet and exchange ideas about how to create more effective and empowering training. In addition to exchanging training ideas and methods, participants improved training skills and exchanged best practices and techniques in health and safety training.

The Trainers' Exchange was a mixture of presentations, plenary sessions, and workshops. Forty three workshops were conducted; these were divided into the following five tracks:

Advanced Training Technologies on incorporating advanced technologies in training, including internet searches, computer/video simulations, and the development and appropriate use of power point development.

Disaster/Emergency Response and Preparedness workshops addressed activities applied to recent disasters and response, incorporating lessons learned from recent emergencies in preparedness.



Sharing Ideas at the Exchange

Instructor Development track covered curriculum development, creating lesson plans, doing needs assessments, strategies for dealing with classroom situations, and specific technical updates.

Life Skills and Job Training sessions addressed the special needs workers new to or reentering the workforce. This included using graduates to promote a training program, building cultural competency, and incorporating life skills in training courses.

Training Approaches for Worker Empowerment workshops addressed a core value of the training programs: empowering workers to stand up for safe workplaces. The sessions included using methods of Popular Education, Root Cause analysis to engage participants, addressing the needs of special populations, and educating for action.

A context for the Trainers' Exchange was provided through two plenary sessions. The first, moderated by Dr. Linda Delp, UCLA, gave an historical overview of the WETP training program. Dr. Eula Bingham, University of Cincinnati and former director of OSHA, described the OSHA New Directions worker education program, a model for the current program. Dr. Craig Slatin, University of Massachusetts Lowell, discussed the period between the tragedy of Love Canal and the passage of SARA, the Superfund Reauthorization Act that created the WETP program. Dr. Robert Bullard, Clark-Atlanta University, traced the history of environmental justice from its roots in Warren County, NC where hundreds were arrested attempting to protect their community from the construction of a PCB landfill to today's ongoing movement where across the country communities of color still combat unacceptable environmental risks.



Dr. Eula Bingham
University of Cincinnati

The complete proceedings of the National Trainers Exchange including presentations and other materials can be found on-line at <http://tools.niehs.nih.gov/wetp/events.cfm?id=2386>



Photograph on Right: Bill Bergfeld, Laborers' International Union of North America

Banner Photographs Top and Bottom: Participants attending the conference

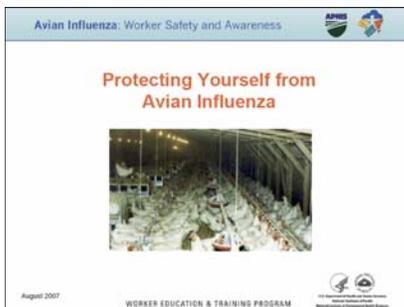


APHIS/NIEHS Avian Influenza Conference

Whether or not the deadly bird flu virus H5N1 mutates to a form that is transmittable between humans, it is already transmittable from birds to humans, killing over 50% of those people contracting the disease. Thus if a major outbreak occurs in our poultry industry, potentially thousands of workers will be involved in response activities including culling and disposal operations. Under the National Response Framework, NIEHS WETP is tasked with assisting with the health and safety training of these workers.

To meet this responsibility, NIEHS WETP developed an Avian Influenza Initiative that included the creation of safety and health curricula and training materials, train-the-trainer sessions on these materials, the incorporation of these new teams of trainers into the WETP Emergency Activation Plan, and the development of partnerships with other responding agencies. A key partner in this effort is the U.S. Department of Agriculture Animal and Plant Health Inspection Service (USDA-APHIS).

As a result, from September 16-19, 2007 nearly 300 industry, labor, federal, state and local agency representatives participated in a 3-day Avian Influenza Conference: *Protecting Avian Influenza Responders* in Bethesda, MD. The conference, jointly sponsored by USDA-APHIS, and the NIEHS WETP brought together agencies and organizations that may be involved in an avian influenza response to discuss, coordinate, and participate in a practice exercise for such an incident. Presentations and breakout sessions focused on online tools, courses, and training, education, outreach and communication initiatives designed to help protect responders during an outbreak.



Responder Training Tool available on -line.



Photographs Above from Left to Right: Joseph "Chip" Hughes, Director, NIEHS WETP; Max Kiefer, Director, Denver Regional Office, National Institute for Occupational Safety and Health (NIOSH); Dr. Thomas "Richard" Walker, Medical Officer, USDA-APHIS

The conference was organized so that separate panels were held on state, industry, federal, and international perspectives on the issues. In addition, 21 separate breakout sessions on training products and programs were held. The topics included the Hazardous Waste Operations and Emergency Response Standard (HazWoper), Disinfection and Cleaning Hazards, Personal Protective Equipment, Carcass Disposal and Associated Hazards, Heavy Equipment Hazards, Critical Stress Management, and Confined Space Hazards, to name a few.

Resource materials and conference presentations are available on-line at <http://tools.niehs.nih.gov/wetp/events.cfm?id=2346>

Photographs below left to right: Table Top Response Exercise; Taking questions after a Panel discussion; David Ippolito, Director, Office of Science and Technology Assessment, Occupational Safety and Health Administration and Dori B. Reissman, MD, MPH, CAPT, US Public Health Service, Senior Medical Advisor, NIOSH



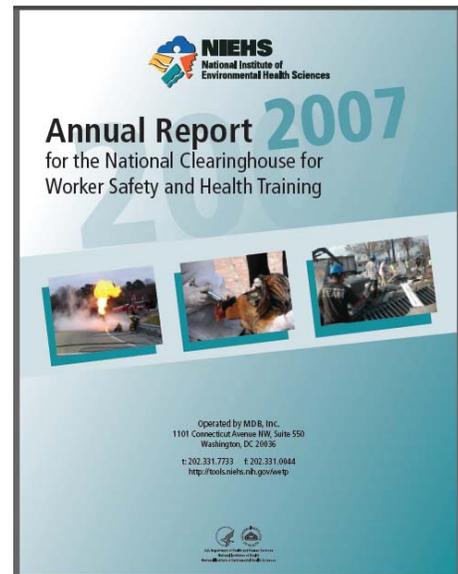
NIEHS WETP National Clearinghouse for Worker Safety and Health Training

Since 2000, MDB, Inc. has managed and operated the NIEHS WETP National Clearinghouse for Worker Safety and Health Training, the centralized distribution point through which members of the worker education and training community can access technical documents and workshop reports, safety and health update information, and curricula produced by NIEHS WETP awardees. Visitors can access the National Clearinghouse website at <http://www.wetp.org>

Annually, MDB, Inc. highlights its work providing an extensive range of communication and technical assistance services to the NIEHS WETP in the Clearinghouse Fiscal Year-End Report. The 2007 Fiscal Year-End Report covers NIEHS WETP Clearinghouse activities from August 16, 2006 to September 15, 2007. The 2007 fiscal year was a challenging and exciting year for the National Clearinghouse. This fiscal year was largely focused on four tasks:

1) developing materials for workers who may respond to an avian influenza outbreak; 2) developing materials for workers responding to an attack using radiological dispersal devices (RDD); 3) a web migration from the www.wetp.org URL to the <http://tools.niehs.nih.gov/wetp> URL and; 4) coordinating the National Trainers' Exchange.

WETP continued its emergency preparedness and response training initiatives following Hurricane Katrina and focused on developing more training tools for skilled support personnel who respond to emergencies. The framework for developing the tools is based on the Department of Homeland Security's (DHS) 15 Disaster Planning Scenarios: Pandemic/Avian influenza being one, and a dirty bomb scenario being another. Avian and pandemic influenza became a growing concern to the preparedness and response community due to the rapid spread of avian influenza and the escalating number of human deaths from pandemic influenza in eastern Asia. The Worker Education and Training Program made the decision to be proactive in preparing workers by administering several grants to existing WETP Awardees and initiating interagency collaborations. These awardees developed training courses and



National Clearinghouse Annual Report Available on line at <http://www.wetp.org>

manuals designed to prepare healthcare workers and skilled support personnel that may be involved in an avian influenza emergency response. As part of this effort, the National Clearinghouse developed a training tool entitled, "Protecting Workers from Avian Influenza." The tool was designed to assist trainers in educating workers on avian influenza and the types of hazards and activities that may be involved in an avian influenza response. The draft training tool was shared with a number of people in a variety of agencies and organizations within the safety and health, emergency response and agricultural community for suggestions and feedback. This feedback was incorporated into the final document.

Other tasks included the development of the RDD training tool, development of a new Clearinghouse fact sheet, updating the Brownfields/Minority Worker Training Program brochure, development of a training tool to educate cleanup workers at the Department of Energy (DOE) on its Safety and Health Program Rule (10 CFR 851), and successful migration to a new URL.

Training Highlights

Hazardous Waste Worker Training Program

American Federation of State, County and Municipal Employees (AFSCME)

Western Region Universities Consortium (WRUC)

AFSCME PhotoVoice: A Participatory Training Tool

The American Federation of State, County and Municipal Employees (AFSCME) Training and Education Institute (ATEI) delivers worker-centered training to public sector employees across the nation, particularly those who are likely to be involved in hazardous material emergencies in their own workplaces. This can include water and waste water treatment workers and street, bridge, sewer, sanitation, and public safety workers.

The AFSCME PhotoVoice Project is a way to give a voice to workers, in this case custodians, in identifying and resolving safety and health problems. PhotoVoice, first developed by Dr. Caroline Wang, University of Michigan, is a participatory action research and training tool that allows workers to tell their own stories through photos that they take themselves. Workers had free reign to take pictures without management interference, or repercussions.

To begin the project, an orientation was held for the custodians volunteering to participate. This included a discussion of the range of health and safety concerns they might encounter, and practice using the digital single use camera they were assigned. Each participant was to keep a picture log explaining each picture and why it was taken. No pictures of other people could be taken without their written

The Western Region Universities Consortium (WRUC) consists of the University of California at Los Angeles (UCLA) Labor Occupational Safety and Health (LOSH) Program (lead agency), University of California Extension at Davis (UCDE), Arizona State University Polytechnic Campus Office of Environmental Technology (ASU), University of California at Berkeley Labor Occupational Health Program (LOHP), and the University of Washington Northwest Center for Occupational Health and Safety (UW).

There are many ways to evaluate training effective-



ness. In the case of annual refresher training, WRUC utilizes a conversation method where trainees discuss changes in the workplace that may have

consent. The volunteers included union and non-union members, both male and female.

After taking up to 25 photos each, an evaluation session was held. Each worker was asked to select the pictures they thought were most significant. These were discussed and categorized according to hazard. Participants also provided suggestions on ways to improve health and safety. The photographs illustrated slip and trip hazards; ergonomic hazards (over-reaching, lifting heavy containers overhead, mop sinks that were too high); lighting-related problems; asbestos; biohazards and medical waste; and weather-related problems. Also identified were emergency response issues, including blocked exits and improper fire extinguishers.

Based on discussion with the PhotoVoice participants, the AFSCME ATEI team made a number of recommendations to management -- both quick fixes as well as longer term solutions. Actions that could be implemented quickly included lowering paper towel holders to avoid reaching, replacing unwieldy, heavy garbage cans, and changing light fixtures to avoid climbs of more than 20 ft with no fall protection.

During this project year, AFSCME ATEI delivered 124 courses to 1939 trainees in 14 states for 11,982 total contact hours. They offered a broad selection of courses ranging from basic Hazard Communi-

occurred a result of their past training, their participation in any emergency response activities, spills or near misses, and how they used information from previous training. WRUC uses this data to analyze the effectiveness of the training and to identify areas in need of additional emphasis. Consider this sample of quotations from the evaluation process.

“A drum containing 50% hydrogen peroxide delivered to a medium sized printed circuit company was stored in the hot sun and developed pressure causing the drum to bulge. The drum was isolated from all personnel and cooled down. Pressure was relieved remotely and an incident was averted.” (ASU)

“I have frequent clean-ups from lab animals, battery acid and oil from University vehicles, mercury from thermometers, lead paint in old University housing, sulfur powder, and because I have been coming to this trainings for over 10 years, I feel better prepared to deal with any of these situations.” (LOHP)

“Utilizing information learned in both this class and other classes (i.e. Industrial Hygiene), I have been able to go back to my employer and assess certain situations and recommend improved safety practices to better protect both our employees and the environment. These classes have been very beneficial and I

have enjoyed attending over the past five years.” (UCDE)



Worker Photographs from PhotoVoice Presentation.

classes (in both English and Spanish) to 40-hour Haz Mat Technician programs with extensive hands-on training. They also addressed the demand for training in related support topics such as confined space entry, trenching and excavation, and workzone safety/traffic control. These topics relate to duties that AFSCME members are frequently asked to perform in the event of an emergency, for instance when a truck spills hazardous materials into a sewer, drainage ditch, or on a roadway.

WRUC Trainees Speak About Training Effectiveness

have enjoyed attending over the past five years.” (UCDE)

“It was great to come to a course that you did not have to just sit there. There were activities, we were able to use the equipment, and share with others and their experiences.” (LOSH)

“On our plant we have several sandblasting cabinets. These cabinets contain aluminum oxide beads, which turns into a very fine dust. Aluminum oxide may cause cancer and other health problems. This safety course has helped me pay close attention to things I take for granted. Now I inform my co-workers about every danger to our health no matter how little the risk.” (UCDE)

During the grant period August 1, 2006 to July 31, 2007, the Western Region Universities Consortium trained 3,299 workers in 210 courses for a total of 39,628 contact hours. Courses offered cover the spectrum of hazardous waste site, TSD, emergency response, hazmat transportation and hazard communication courses, as well as other courses specific to particular occupations. Courses were offered throughout EPA Regions IX and X including the Pacific Islands, on Native American Reservations and along the US/Mexican border. The trainee

Left Photograph: Discussion group during WRUC training

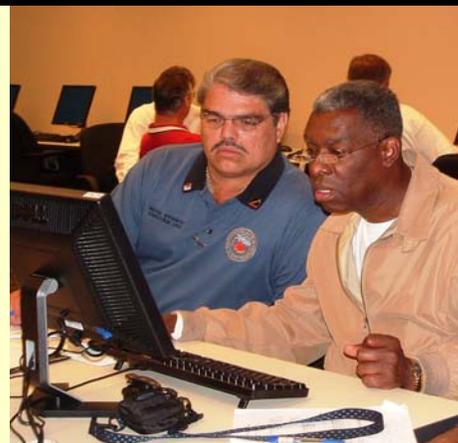
CPWR: Training that Empowers Workers

The Center to Protect Worker's Rights (CPWR) Consortium includes the following international/national construction unions: Insulators & Asbestos Workers, Painters, Boilermakers, Plasterers & Cement Masons, Bricklayers, Plumbers & Pipe Fitters, Carpenters, Roofers, Electrical Workers, Sheet Metal Workers, and Iron Workers. *Note: During the next project year, CPWR will change its name to the Center for Construction Research and Training.*

CPWR training conducted under the NIEHS cooperative agreement has changed many lives. The realization that conditions at work have exposed workers to hazards that are both dangerous and imminent, a realization that arises from the synergy between course materials and peer instructors, has lead many to re-evaluate their assumptions about health and safety on the job. Many have ex-

pressed a desire, as a result of training, to become much more proactive in promoting health and safety on the job. This is a direct result not only of the quality of training materials and curriculum, but more specifically of the relationship between the student's work life and the course content as expressed by both the materials and by the ability of the peer instructor to bring home the complex issues discussed in class. One specific anecdotal incident illustrates clearly how this training results in practical use. In a filmed session, a veteran carpenter instructor describes the following incident:

"A carpenter apprentice who had recently taken a 16-hr Permit-Required Confined Space Entry course offered under the NIEHS grant was assigned the task of welding 18 feet up inside a steel vessel. After seeing a technician monitor for oxygen at the ground-level opening of the vessel, the apprentice refused the assignment, claiming that the monitoring needed to include samples from different heights in the vessel. The foreman decided to appease the apprentice and had



Photograph Above: Computer-based classroom training.

the safety specialist order the monitoring higher up in the tank, where oxygen levels were recorded at 16%. Welding and grinding would have also used oxygen, and the apprentice would probably have fallen."

During the project year, CPWR conducted 190 classes and trained 2,880 workers, technicians and support staff resulting in 49,466 contact hours of training.

The Hazardous Materials Training and Research Institute (HMTRI) includes the Community College Consortium for Health and Safety Training (CCCHST) representing 34 states and one territory.

The Consortium requires its members to provide good facilities and resources for training. This is verified through site audits. Thus each member is required to provide at a minimum:

- Equipment and supplies which include full protective gear for students, a variety of state-of-the-art monitoring and sam-

pling equipment, and supplies for containment, control, mitigation and restoration.

- Classrooms that include seating, preferably at tables, for 20 students and three additional chairs for instructors and observers. At the front of the classroom there should be one or more tables for instructor use. Classrooms should have adequate lighting and be able to be darkened for viewing slides and videos. A 60" AV screen, a 19" color TV, a video player, a flip chart or board, and a video/data projector are required. Classrooms should be accessible to a loading/unloading or equipment storage area.

- Facilities for hands-on demonstrations and simulations include a physical space (parking lot, field, warehouse, garage, or combination) at least 4000 square feet in size. A 100 by 100 foot area with a garage, warehouse or small storage building is ideal; access to telephone or radio to summon emergency assistance; a source of running water from a hose bib or spigot to which a garden hose can be

HMTRI/CCCHST Stress Good Learning Environments

attached to fill drums and containers; shelter; drinking water; and accessible rest rooms are required.

- Facilities for computer-based learning include an open learning computer lab with a minimum of five computers with monitors, CD ROM, Sound Card and speakers or headphones, and Internet access. Computers should have access to a printer. The area should have one or more TV/VCR combinations for viewing videos. Access to a telephone to contact instructors is suggested.

During 2006-2007, 55 consortium members in 27 states delivered 354,394 contact hours of training and 2,169 courses serving 34,141 workers.



Photograph Above: Hands-on Training at HMTRI

Training Highlights

Hazardous Waste Worker Training Program

International Association of Fire Fighters (IAFF)

International Brotherhood of Teamsters/National Labor College (IBT)

Outside Auditors Praise IAFF Training

The International Association of Fire Fighters (IAFF) has more than 2,700 affiliates, representing 263,000 fire fighters and paramedics in more than 3,500 communities in the U.S. and Canada.

During the year, IAFF conducted 52 classes and trained 1,251 students during 64,964 contact hours.

Between September 2006 and March 2007, IAFF hired an outside consultant, the Lippy Group, LLC, to review the HazMat/WMD training program.

The Lippy Group found:

“The training program conducted by the Hazardous Material and Weapons of Mass Destruction Training Department of the International Association of Fire Fighters to be a very mature, efficiently run, creative and im-

The International Brotherhood of Teamsters (IBT) conducts its HWWT activities through the IBT Worker Training Program. The National Labor College (NLC) carries out its HWWT activities through the NLC Rail Workers Hazardous Materials Training Program.

During the 2006 - 2007 grant year, the IBT-NLC Consortium trained a total of 4,380 workers in 289 courses, which represents 50,915 contact hours of training (IBT – 2,347 workers, 137 courses, 35,136 contact hours; NLC – 2,033 workers, 152 courses, 15,779 contact hours).

The IBT Worker Training Program provided training to current and potential remediation workers and supervisors at hazardous waste remediation projects; current and potential construction workers involved in the remediation of hazardous waste sites; truck drivers

portant effort that is universally well-regarded by key stakeholders. Viewed solely as an independent effort, the IAFF training program has archived an excellent record of reaching a critical population in a consistently cost-effective manner.”

In addition, the July 26, 2007 report by The Lippy Group identified several beneficial areas of the IAFF program. The report found:

1. The program to have clearly stated objectives.
2. The program was accomplishing its objectives.
3. The appropriate facilities and staff available and committed to the program.
4. An appropriate mix of classroom, demonstration, and hands-on training.
5. The program provided quality worker health and safety training that fully meets the intent and requirements of the applicable

involved in the transportation of hazardous waste and hazardous materials. The purpose of this training was to increase worker safety, and to protect work sites, communities, and vital transportation infrastructure from incidents and emergencies involving hazardous waste and hazardous materials.

During the same period, the NLC Rail Workers Hazardous Materials Training Program trained a total of 2,033 rail workers from 39 states and the District of Columbia in 152 courses. This represents a total of 15,779 contact hours.

The NLC, in conjunction with Citizens for Rail Safety, Inc., released a study entitled *Training in Hazmat and Rail Security: Current Status and Future Needs of Rail Workers and Community Members*. The study found that rail workers lack basic, necessary emergency prevention and response training. The NLC study followed a 2005 report by the International Brotherhood of Teamsters Rail Conference that revealed that 84% of the rail workers surveyed had not received terrorism prevention and response training in the last year.



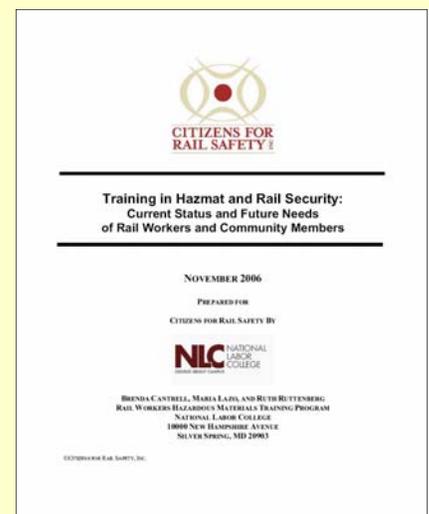
IAFF Hands-on HazMat Technician Training

regulations.

6. The course materials to be current and the delivery methods relevant to the training target audience.

7. The measures of program outcome adequate.

Transportation Safety Central to the Mission of the IBT/NLC Consortium



Report pictured above available on line at <http://www.bmwe.org/News/2006/11NOV/CRS%20Report.pdf>



Left photo: Teamsters HazMat training class.

Training Highlights

Hazardous Waste Worker Training Program

International Chemical Workers Union Center for Worker Health & Safety Education (ICWU)

International Union of Operating Engineers (IUOE)

ICWU Plume Mapping Protects Workplaces and Communities

The Center for Worker Health & Safety Education is operated by the International Chemical Workers Union (ICWU) in cooperation with the International Association of Machinists and Aerospace Workers (IAM), the Coalition of Black Trade Unionists (CBTU), the United Food and Commercial Workers Union (UFCW), the American Federation of Teachers (AFT), the American Nurses Association (ANA) and the American Federation of Government Employees (AFGE).

This year, the consortium delivered 44,208 person hours of training in 262 classes to 4,240 workers.

In addition to a wide range of hazardous materials training and rank and file trainer development, ICWU delivers a wide range of new programs including mold remediation, toxic plume mapping, and disaster preparedness.

In cooperation with the National Resource Center and Eastern Michigan University (OSHA approved Training Centers), the consortium also conducts a number of OSHA authorized courses. They also conducted a Workforce Development training program in cooperation with the City of Cincinnati, CBTU and a number of community organizations.

Significant chemical spills are a daily occurrence throughout the United States. In 2005, with data from just 15 states, the Agency for Toxic Substances and Disease Registry reported 8,603 acute hazardous substances events; there were 2,034 victims involved in 778 of these events; and members of the general public [47.0%] constituted the largest proportion of the population groups injured, followed by employees [39.1%]. In addition, many

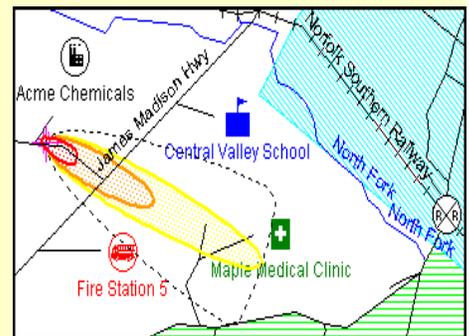
of these incidents involved releases to the air and required evacuations. Thus there is a clear need for responders and trainers to better understand the dynamics of plume releases and the need to train workers to safely and efficiently respond to these events.

The ICWU Plume Mapping course enables participants to input data and generate a projected plume for chemical releases. Information such as the identity of the chemical, area topography, weather conditions and the time of day or night all generate data that participants are trained to enter into the applicable software program. Participants who successfully complete the course are able to navigate through a variety of software programs related to plume mapping. The plume maps produced are a vital tool in determining areas that need to be evacuated as well when sheltering in place may be a more appropriate option.



Photograph above: Detroit firefighters and Hazmat team members after completing ICWU plume mapping course.

Map on right: Example of Plume Map prepared with the National Oceanic and Atmospheric Administration's (NOAA) modeling program. Courtesy NOAA.



During 2006-2007, the International Union of Operating Engineers through its National Training Fund (NTF) provided training to 17,400 workers under the NIEHS HWWT Program. Through the 40-Hour Basic Site Worker Course, 2,024 members were trained and 9,695 members refreshed their basic site worker training through the Eight-hour Site Worker Refresher Course.

The NTF issued in February 2007 the guidance document: *Building Alliances between Operating Engineers and Emergency Responders to Save Lives during Disasters*. This document was produced under an OSHA Susan Harwood grant with the purpose of addressing the lack of disaster site trained Skilled Support Personnel, such as operating

engineers, and the lack of collaboration between Skilled Support Personnel and First Responders, specifically regional response groups such as state Urban Search and Rescue Teams (USAR).

One IUOE training technique illustrates the seriousness and commitment brought to their training programs:

"In my classes I have the students write a "last letter" to their loved ones that they are leaving behind. And as soon as I do that, we go through that letter a little bit...it works great with first year apprentices. When they get done, there's not a dry eye in the house ... When they've all read their letters, I say to each and every one of them, 'tomorrow when we leave here and go to work and they're asking you

A Letter to a Loved One: An IUOE Training Technique

to make that pick that's just a little over the limits or they're going to put you on a slope, stop and think about that letter and what you're leaving behind and the effect you have on this local and this community and this country. Each one of you will touch so many people you don't even know.' And it really makes the safety start to sink in. Everybody has to read somebody else's letter and it works very well."

Photographs Below: IUOE HazMat Training.



Training Highlights

Hazardous Waste Worker Training Program

International Union, United Auto Workers (UAW)
Laborers/Associated General Contractors Education and
Training Fund (L-AGC)

UAW partners with Maytag

The UAW conducted 115 programs, delivering training to 2,221 participants with 12,952 contact hours between August 1, 2006 and July 31, 2007. This included five 40-hour Technician Level Industrial Emergency Response (IER) courses, totaling 63 trainees and 2,520 contact hours and two 24-hour operations level courses for 31 trainees and 744 contact hours.

In January 2007, the UAW Health and Safety Department conducted a 40 hour IER Technician Level training at Maytag in Newton, Iowa. The trainees were skilled tradesmen who would be demolishing a plating line that was no longer in use. Chemical hazards included chromic acid and cadmium. The curriculum had to be adapted to the fact that the tradesmen were not going to do traditional HazMat Technician work. They would be more like HazMat site workers, removing pipe, tanks, ventilation ducts and all of the associated utilities every day. The training had to consist of all of the elements needed to fulfill requirements for technician certification and also to address the many concerns the trainers had with a full scale HazMat demolition. The team of worker trainers made the

Maytag training as site-specific as possible. After chemical hazard identification was taught, all class participants toured the defunct plating area to identify potential hazards and problems. After the tour, the group generated a list of questions specific to the demolition work. The questions were written out and posted around the training room. The trainers and students referred to these questions at various times throughout the week. On the final day each item listed was revisited. By the end of the training, action plans were made for every item.

The training won high praise. Many people commented on how the training was made specific to Maytag and how they appreciated it. Other comments included the following:

A Safety Committee member said, "I really liked that Maytag chemicals were used in the exercises although I didn't realize the hazards involved with the chemicals we've used for years." Maytag's Safety Manager had this to say: "If I had to use a word to describe the training this week, that



UAW training class.

word would be excellent. I would say that word pertains most to the trainers. The trainers had to work hard to try to give the class what they needed. I don't know where else we could have gotten that. Most training is just canned, you get what they have, which may not be what you want or need. These guys took it seriously to give Maytag what they need at this time."

During the time period August 1, 2006 to July 31, 2007, the Laborers-AGC Education and Training Fund (Laborers-AGC) conducted 428 courses for 4,787 trainees under the Hazardous Waste Worker Training Program (HWWTP). This accounts for 126,122 contact hours of training.

The West Virginia Laborers Training Fund has been conducting training under cooperative agreements from the NIEHS WETP since 1992. During this time, the training fund has provided hazardous waste, radiation and disaster preparedness training to its core constituency of Construction Craft Laborers and apprentices and have provided grant sponsored training to various law enforcement agencies (Metro Washington DC Police De-

partment, U.S. Marshals, Federal Protective Services, Secret Service and U.S. Capital Police) and state and federal agencies (Department of Energy, WV Department of Environmental Protection, WV State Health Department and Federal EPA Region 3). The training fund has partnered with many civic groups in the state of West Virginia to recruit and train the workforce of tomorrow needed to build the infrastructure of West Virginia. These groups include the Helmets to Hardhats, Women's Work for WV, Work for WV Centers and the numerous vocational high schools located throughout the state.

After the attacks of 9/11, instructors from the West Virginia Laborers Mobile Unit were dispatched to New York City to

L-AGC Training for Construction Craft Laborers

train construction workers who were courageously clearing the wreckage of that day. They provided hazardous waste and site specific training to dozens of 9/11 workers. These instructors have been recognized by the New York Port Authority, the WV Governor's Office and the Laborers International Union of North America for their efforts during the aftermath of the 9/11 attacks.

Photographs below of L-AGC training.



Midwest Consortium: Building Partnerships for Environmental Protection

The Midwest Consortium delivered 893 programs to 16,402 persons between August 1, 2006 and July 31, 2007. 98 percent of these trainees who reported were employed at the time of training. 13 percent reported less than one year of experience with hazardous materials; 12 percent had no previous health and safety training.

Partnerships with the Ford Motor Company, local Brownfields initiatives, and mutual aid agreements illustrate outreach and collaboration. Partnerships with community groups resulted in empowered community members in Detroit, throughout Ohio, in Tennessee, and improved recognition of emergency response needs

and training capabilities for the Three Affiliated Tribes in North Dakota. As a result of training provided by the Three Affiliated Tribes Leech Lake Reservation Public Works Director wrote:

"We would not have been able to complete a cleanup at Eger, MN without this training – uniformly, all of the people who went through the training (40H) last year said they did not know the hazards that existed on site when they first started this project. This training provided us with everything they needed to understand and respond to the hazards they faced."

The Greater Cincinnati Occupational Health Center provided industrial emergency response training that saved an Ohio company from contaminating a nearby waterway. Using skills at the operations, technician level and incident command levels, the emergency response plan was implemented when an observant employee noticed an empty sump after a night of rain. Valves left open after a delivery allowed oil-contaminated water to escape



Technician Training

from a sump and enter the nearby creek. Using available materials, a dam was constructed to restrict flow, and an outside remediation company called. The remediation personnel built a second dam, downstream and used the original dam location to pump the creek and recover the contaminated water. Both dams held for the four-week mitigation period, and no contaminated material entered the main waterway.

The New Jersey/New York Consortium continued to track trainee participation at worksites. The Center distributed a voluntary survey at the beginning of each 8-hour Refresher this year. The survey listed 12 different types of hazardous waste facilities the student may have worked at in the past year. The participants were asked to identify the site by name, state where it was located, chemicals present and students' primary role. The 12 different types of sites listed on the survey were EPA National Priority List Site, Military Base, RCRA Corrective Action, Emergency Response, Voluntary Private Cleanup Site, RCRA/TSD Site, Other Fed-

eral Led Site, UST Site, Brownfield Site, State Led Site, Private Site, Emergency Site, and a DOE Site.

A total of 145 workers completed the survey. The largest percent of respondents, 45%, claimed to have participated in cleanup at a voluntary, private site. The second highest, 28%, claimed to have worked at a UST site. EPA/NPL sites were the most commonly reported sites worked on in the previous year. The name of chemicals involved at the site was often not reported.

The primary roles listed by the majority of students were Project Manager, Project Engineer, Health and Safety

Tracking Trainees in New York and New Jersey

Officer, and Industrial Hygienist. The majority of sites were in New Jersey. While this method of collecting tracking data has its limitations, utilizing the Refresher course to reach trainees to obtain tracking data is reasonable for open enrollment courses.

Photographs below are of
NJ/NY Consortium training.



Training Highlights

Hazardous Waste Worker Training Program

The New England Consortium (TNEC)

OAI, Inc. (OAI)

TNEC and EPA Partner for Regional Tribal Nations

Over the last five years, TNEC and EPA Region I have collaborated to provide training to regional Tribal Nations and Reservations. The EPA Tribal Program works with the tribes to assist them in developing comprehensive multimedia ecosystem protection programs. TNEC provided a 24-hour ER course for the Wampanoag Tribe on Martha's Vineyard and an 8-hour site worker refresher at the Penobscot Indian Island Reservation near Old Town, Maine, for the benefit of the 5 Tribes/Reservations in northern Maine.

"I leave this training with more awareness of every day chemicals, how to better protect myself and others. Most helpful to me was how to recognize a situa-

tion and containing it." Public Emergency Responder, Wampanoag Tribe.

"I found that the training was most valuable to me as an EMT responding to a hazardous material incident. The teachers were all interesting, knowledgeable, interactive, organized. They worked well as a team and made the practice sessions lively as well as informative. Thanks for a job well done. The exercises were relevant. It made class more interesting and facilitated the learning process." EMT Volunteer/Student, Wampanoag Tribe.

Illustrations on right: Screen Shots from TNEC Computer-based Hazardous Waste Site Simulation



During this program year, OAI provided training to 2,731 workers through the delivery of 147 courses, which generated 59,824 instructional hours. The notably higher than planned outcomes were attributable to improved organizational structure, increased technical staff capacity and the implementation of the successful Train-the-Trainer model, which prepares local industry experts to be peer trainers, expanding local capacity and achieving a significant multiplier effect.

Consortium partner Maine Labor Group on Health (MLGH) conducted 28 courses serving 176 students and generating a total of 2,864 instructional contact hours during the reporting period.

OAI continued to work closely with the Kentucky State Police, drug enforcement arm, to train its personnel throughout the

Commonwealth.

OAI conducted one Methamphetamine Awareness course, five Methamphetamine Technician Refresher courses and one Methamphetamine Technician course for 148 first responders. The technician level course was sponsored by the Richmond Police Department and conducted at the Richmond Fire Department Fire Training Center. In attendance were representatives from the Kentucky State Police, the Richmond Police Department and the Louisville Metro Police Department. Students received instruction in accordance with 29 CFR 1910.120 and the Kentucky State Police Clandestine Laboratory operating procedures.

In April, OAI instructors were invited to oversee and evaluate a large-scale practical meth containment exercise conducted

OAI, INC: Internal Improvements Lead to Greater Achievements

in western Kentucky involving state police and smaller law enforcement departments within the region. One of OAI's instructors, Detective Louis Weber, videotaped the event so that it can be used as a teaching tool for future meth-related HAZMAT classes.

Photograph below courtesy OAI, Inc.



Hazardous Materials Emergencies highlight SEIU Training

From August 1, 2006 through July 31, 2007 SEIU trained a total of 1,380 participants in 91 classes for a total of 14,860 hours of training. They exceeded their goals for this training year, having conducting 125% of their class goals (91 completed to 73 planned), training 104% of their participant goals



(1,380 trained to 1,330 planned) and exceeding by 32% their total training hour goals (14,860 hours trained to 11,280 planned).

The SEIU training has also made a difference in hospital emergency response. Hospital workers risk exposure to releases of hazardous materials at their workplace. These materials can be released due to lack of proper controls, handling, storage, or maintenance.

In reports of actual incidents which occurred following the training, participants were able to assess the spills of hazardous materials, to use the proper procedures and materials to isolate the hazard, and to initiate the proper sequence of emergency response. In many cases, participants reported that prior to the training, spills and leaks would not have been either recognized or properly responded to. For example, during the past grant year, idamycin, a chemotherapy drug, was spilled at a medical center in Northern California. Initially, the department called housekeeping. However, staff who had completed the Project course recognized that this was a hazardous substance and should not be treated lightly. The scene was then isolated and trained personnel were brought in.

OSHA has clarified the definition of an emergency to take into account the level of chemical knowl-

edge of workers: "The properties of hazardous substances...will have an impact on what employees can handle safely...Additionally, there are other factors which may mitigate the hazards...such as the knowledge of the employee in the immediate work area, the response and personal protective equipment at hand, and the pre-established operating procedures for responding to releases of hazardous substances." Given their limited training and limited personal protective equipment, cleaning up even small spills of some materials (such as chemotherapy drugs and glutaraldehyde) poses a hazard to the target population.

Workers and members of the public who are involved in hazardous materials emergencies may be injured and contaminated with these materials. The Joint Committee on the Accreditation of Healthcare Organizations (JCAHO) expects regional health care facilities to treat these patients, and to decontaminate them before treatment is provided. Although decontamination often takes place at the scene of the emergency, it also takes place at the hospital.

Photograph on left: SEIU Avian/Pandemic Flu Preparedness Training

The USW Tony Mazzocchi Center for Health, Safety and Environmental Education (TMC) conducted 420 regional and site-hosted classes in 24 states from August 1, 2006 through July 31, 2007, reaching 8,981 workers for 88,427 contact hours. The TMC goal for the grant year was 224 classes reaching 5,706 participants for 73,525 total contact hours. These accomplishments represent 188% of their goal for classes, 157% for participants, and 120% of their targeted total contact hours.

The USW has been recognized internationally as a leader in the field of workplace safety and health, particularly for their Triangle of Prevention Initiative (TOP)

To quote from a recent USW report:

"Through the TOP Initiative, USW has proven that workers and their unions are critical partners in identifying and controlling workplace hazards. They do this as full participants in designing, developing, evaluating and maintaining TOP as a vital component of plant health, safety and environment.

The TOP Initiative seeks to identify and

dismantle barriers to identifying and controlling workplace hazards. It does this by directly confronting two of the most serious obstacles: first, the blame culture that surrounds accident and near-miss reporting; and second, the lack of worker-friendly methodologies (tools) and training for uncovering and reporting workplace hazards.

TOP's approach incorporates a hierarchy of "systems of safety" for prevention. The Initiative uses the systems of safety hierarchy for identifying both failures and solutions affecting workplace health, safety and environment issues. The hierarchy begins at the highest level with 1) design and engineering, followed in descending order by, 2) maintenance and inspection, 3) mitigation, 4) warnings, 5) training and procedures, and 6) personal protective factors. Identifying and correcting hazards before accidents occur is the key to any health and safety program. The systems of safety approach accomplishes this by incorporating fundamental concepts and applying them to the practical, everyday operations in the workplace.

Within TOP, labor and management jointly use a rule-based investigation

USW Triangle of Prevention Initiative

methodology based on logic tree diagramming to find root causes and systems failures. Investigation teams use this methodology to investigate all incidents and near misses at the worksite. After determining the root causes, the team develops recommendations for corrective actions using the hierarchical systems approach and tracks them to completion."

Photograph below: USW training



UAB Partners to Serve Native Americans

During FY 2007, the second year of the current five-year grant period, UAB's Center for Labor Education and Research (CLEAR) continued to provide quality grant-funded worker training through its Workplace Safety Training (WST) program. UAB continued to provide grant-funded training in a wide array of topics to several worker populations including members of the CWA, Native American tribal members and employees, and public safety personnel. The training helps workers protect themselves and their communities from hazardous materials encountered in workplaces and during emergency response operations. Fee-supported training for consultants, regulatory personnel, environmental managers, industrial emergency responders, and hazardous waste workers also continued and provided an important source of income to the UAB program. The UAB instructor staff continued to develop new training materials. Workers trained by UAB through the grant program continued to use UAB materials, teaching methods, and instructor support to provide training to their peers.

UAB had another successful year in training Native Americans through a partnership with the Native American Fish and Wildlife Society (NAFWS). A total of eighteen courses in First Responder Awareness Level, First Responder Operations Level, Incident Management Systems, Clandestine Drug Lab Awareness, Weapons of Mass Destruction Awareness, and Radiological/Nuclear Awareness were proposed for this year. UAB actually provided 22 Native American courses during the grant year. Whenever possible, two or more courses were offered at host locations in order to maximize training funds. Training was provided in the southeastern, southwestern, and northwestern geographic regions of the United States - in some cases, at locations

that were remote and difficult to access. As in previous years, UAB providing training at every location requested by Native American tribes through the NAWFS.

Most Native American trainees are tribal members, including tribal employees of natural resource, law enforcement, emergency medical, fire service, and public works agencies. A small number of non-Native employees of tribal agencies, or other agencies that cooperate with the tribes in emergency operations, also attend. The Native American trainee population continues to be very interested in preparing for hazardous materials emergencies that may occur at locations such as transportation corridors crossing tribal lands. As a result, significant interest in hazmat first responder and IMS courses continues. The tribes also continue to show strong interest in Clandestine Drug Lab Awareness training, no doubt because of the continuing methamphetamine epidemic on tribal lands. The tribes also continue to request the WMD Awareness and Radiological/Nuclear Awareness courses offered by UAB.



Photograph: UAB Confined Space Training.

Minority Worker Training Program Highlights And Brownfields Minority Worker Training Program Update

The NIEHS Worker Education and Training Program has administered and managed the Minority Worker Training Program since 1995 and the Brownfields Minority Worker Training Program since 1998. Under these programs, individuals with little or no skills in construction or environmental remediation are recruited and trained to enter this career path. Recruitment has traditionally focused on increasing the number of under-represented minorities who are unemployed or underemployed. The WETP, through its awardees, has achieved significant results in communities across the United States. Under these programs, the awardees have connected local residents who live near contaminated industrial sites, often called Brownfields, with valuable job training, and local community based organizations and developers with these now highly-trained workers. The training has reached more than 6,200 people - workers who are now licensed and qualified to work on hazardous cleanup sites in approximately 23 cities - from East Palo Alto, CA to Savannah, GA.

This pre-apprenticeship model of training includes skills ranging from basic construction and other skills based training to environmental courses such as HazWoper and air monitoring to asbestos and lead abatement. By providing the technical and life skills courses that can lead to a stable career, these programs have provided these trainees an opportunity to rebuild their lives and revitalize their communities. And with the overwhelming majority now working, paying taxes, and contributing to their neighborhoods, they are taking full advantage of this opportunity. This includes getting further training in formal apprenticeship programs, learning highly specialized skills in construction and environmental remediation including areas such as green construction, solar installation, crane operation, and electrical work. Many of the program trainees and graduates have worked as volunteers to help rebuild their communities. In New Orleans, the CPWR Carpenter's Union program worked with a program "Neighbors Helping Neighbors", where New Orleans MWTP students, with supervision from the Carpenters' Union, assisted with the cleanup of one of their neighboring churches in the Ninth Ward, Law Street Baptist Church. In addition to this effort, the same New Orleans students volunteered alongside 25 New York City District Council of Carpenters to renovate two New Orleans' fire stations.

Since inception, the MWTP awardees have successfully trained 3,884 young adults in worker health and safety for construction and environmental cleanup work. The overall job placement rate is 67% for a total of 2,587 trainees employed. See Page 31, Appendix 1). The majority of the trainees are male at 86% with females at 14% (See Page 31, Appendix 2).

The Awardees for the Minority Worker Training Program have just completed their third year of the five year award



NJ/NY Consortium students working in the Staten Island, NY Community

cycle. The Dillard University Historically Black Colleges and Universities Consortium (Dillard HBCU Consortium), the Center for Construction Research and Training (CPWR) - formerly the Center to Protect Workers' Rights, the OAI Consortium, and the New Jersey/New York Consortium trained individuals in New Orleans and Baton Rouge, LA; Savannah, GA; Biloxi/Gulfport, MS; Oakland, CA; Baltimore, MD; New York, NY; Chicago, IL; Washington, DC; Houston, TX. Each of the 10 training sites offered a diverse array of environmental remediation, life skills and construction courses to assist each individual with the skills necessary to obtain jobs in the environmental remediation and construction industries. For this period, a total of 385 individuals were trained and 241 of them obtained employment for a job placement rate of 63% (See Page 32, Appendix 3).

The program awardees conducted 241 courses and a total of 107,589 contact hours of training (See Page 33 and 34, Appendices 4 and 5). As compared to previous years of job placement at 71% in 2006, the lower job placement rate this year is attributed to the Dillard HBCU and CPWR programs in Biloxi/Gulfport, MS and Baltimore, MD. The Biloxi/Gulfport, MS program experienced significant challenges due to devastation of Hurricane Katrina and the problems with recruitment and retention of Katrina victims. While the Baltimore, MD program also had considerable problems with job placement this year.

The Brownfields Minority Worker Training Program (BMWTP) has successfully trained 3,139 trainees over a ten year period. The overall job placement rate is 69% for a total of 2,158 trainees employed. For the 2006-2007 year, 388 students were trained with 313 of them employed for an exceptional job placement rate of 81%. Highlights of the Minority Worker Training Program and a summary of the Brownfields program are detailed in this report.

Minority Worker Training Highlights

The Center for Construction Research and Training—CPWR (CPWR) Consortium

For the period of August 1, 2006 to July 31, 2007 the CPWR MWTP Consortium enrolled 74 underserved minority residents living in and around Baltimore, MD; New Orleans, LA; and Oakland, CA. Training was provided in basic construction skills and/or environmental remediation skills. CPWR proposed to place 80% of the graduates. A total of 26,130 contact hours of training was provided. Baltimore trained 20 with 10 employed, New Orleans trained 25 with 18 employed and Oakland trained 25 with 20 employed. The CPWR Consortium trained 74 students and exceeded its training goal of 70 students. The Consortium graduated 67 (or 91% of the students and achieved a 72% (or 48 graduates) placement rate, with graduates earning an average wage of \$13.29/hour. Wages ranged from \$11.37/hour to \$22.00/hour. The 48 students secured jobs in the following areas: 85% of them were in construction, 2% environmental and 13% other types of jobs.

CPWR Yearly Highlights:

- Baltimore MWTP evidenced results from an initiative started last year under a First Source Hiring agreement with John Hopkins' construction sites and the East Baltimore Development, Inc. bio-tech redevelopment project. Twenty percent (20%) of the program's job placements were at this site.
- In spite of all of the cleanup and construction work stoppages, the 28 New Orleans MWTP graduates employed from last year's program retained employment throughout the past 12 months.



Left to Right: Judith McGough, 1994 graduate of CMTU and instructor; journey person carpenter.; Daryl Smith, Fall/Winter Graduate 2007. Apprentice electrician; Kizetta Vaughn, CPWR and Art Shanks, CMTU

- A former female graduate of the Oakland Cypress Mandela Training Center (CMTU) became a "trailblazer" in a non-traditional role as an Operating Engineer (crane operator) on the new San Francisco Bay Bridge.

The Dillard University Consortium

The Deep South Center for Environmental Justice at Dillard University in New Orleans in partnership with the Environmental Justice Resource Center at Clark Atlanta University in Atlanta, GA, and in collaboration with Southern University in Baton Rouge, the Citizens for Environmental Justice in Savannah, GA, the Center for Environmental and Economic Justice in Biloxi, MS, and minority-owned and institutional based training providers, implemented another year of training in Baton Rouge and New Orleans, LA; Savannah GA; and Biloxi/Gulfport, MS.

In Baton Rouge, sixteen (16) of the twenty (20) trainees have been placed, mostly in environmental jobs ranging from \$10.00 to \$16.50 per hour (80% placement rate). In Savannah, twenty-three (23) of the twenty-five (25) trainees have been placed (92% placement rate). The



jobs are split between construction (\$9.00 per hour) and environmental technician (\$10.00 per hour).

Savannah Success Story –A helping hand from lockdown to liftoff as a environmental technician

Three trainees lived in the Coastal Transition Center – a center aimed at transitioning people from the corrections system into society. The worker training program was an excellent fit with that center's mission, as it provided these young people an opportunity to improve their job skills as well as their life skills. As residents of this facility, the trainees had meetings to attend, strict reporting procedures, and the need to gain permission for every aspect of the hands on training. In spite of these hurdles, these three were the first to be placed in full time employment after graduation. Joseph Coiner, Malik Crawford and Steven Fuller were hired by Envirovac as environmental technicians starting at \$10.00/hour.

In Biloxi/Gulfport, seven (7) of the fifteen (15) trainees have been placed (35% placement rate). Three of the job placements are in construction/carpentry (\$10.00 per hour); one trainee was placed as an environmental assistant at a local discount superstore (\$8.90 per hour). The Biloxi Program felt strongly that competition from the casino industry limited employment opportunities in environmental cleanup to salaries that were not comparable to those offered by the casinos, so the program focused more on construction work that was plentiful during the rebuilding efforts. Even with this change, the job placement rate did not increase as anticipated. In the New Orleans Program, fourteen (14) of the twenty (20) have been placed (70% placement rate). The jobs are mostly environmental, with most being placed as asbestos abatement workers (\$13.00/hour). The overall job placement rate for all programs excluding Biloxi/Gulfport is eighty-one percent (81%). Including Biloxi/Gulfport, the job placement rate for all programs is seventy percent (70%).

Left Photograph: Dillard Trainees in Hazmat class

Minority Worker Training Highlights

OAI, Inc. Consortium

During the 2007 program year, the OAI Consortium focused on strengthening its programs through building new community, training and industry partners. The OAI Consortium is composed of: (1) OAI, Inc. (OAI), the primary grantee, and program operator in Chicago and New York City (Bronx); (2) Wheeler Creek Community Development Corporation (WCCDC), sub-awardee and service provider in Washington, DC, and (3) Make Ready, Inc. (MRI), sub-awardee and service provider in Houston. The overall goal of the OAI Consortium's is to foster economic improvement, environmental awareness and stewardship in individual participants, as well as in the community by providing sustainable employment. Each provider built on past training accomplishments and addressed issues from the previous year.

The Consortium surpassed its enrollment goal of 140 by serving 15 more students than planned in programs located in Chicago; New York; Washington, DC; and Houston, TX. One hundred thirty-four (134) participants (22 above goal) completed training, representing an 86% completion rate. Ninety-nine (99) students secured employment as a result of the program, for a job placement rate of 64%. The OAI Consortium completed a total of 99 courses generating 36,863 contact hours.

The Chicago program surpassed its goals and had a job placement of 88% and the Washington program's job placement rate was reasonable at 68%. As students progressed through the Chicago program, average math test scores improved from 69% to 86% as students increased their knowledge in the technical courses and practiced the skills they learned during basic math courses. Through a partnership with the Chicago Department of Environment, all MWT graduates from cycle I were offered paid on-the-job training and an opportunity to acquire additional skills in electronic recycling and computer refurbishing at the new state-of-the-art City-of-Chicago Goose Island Recycling facility, which is under the management of WRD Environmental, Inc. Seventeen (17) MWT graduates from Cycle I were placed in the program and received an hourly rate and support services totaling \$11.00 an hour. Of the 17 students enrolled in Goose Island Training, eight acquired additional employment related to training, including lead abatement, construction and environmental remediation jobs. A total of 38 students were placed (88% of enrollees) in environmental (23), construction (2), electronics recycling (9) and other fields (4). In Chicago, the largest employers were Aerotek E&S, Del Tech, Spike Environmental, SET Environmental and WRD Environmental. The other programs in NY and Houston experienced lower job placement rates at 48% and 47% respectively.



OAI Life Skills/Career Development Training

Chicago Success Story:

Jay Pulphus, a graduate of the 2006-2007 Chicago program came to OAI with a conviction for manufacturing and conspiracy to deliver a controlled substance. After completing 6 months of incarceration and 2 years of parole, he was still unable to find viable employment and he lost his residence and became homeless when moving to Chicago. He found shelter in abandoned buildings and on porches. One day while sitting on the steps of Treadstone Baptist church, he met an individual who introduced him to Minister Tina Scott of Total Resource. Minister Scott suggested that he apply for OAI's MWT program, and he was chosen from a group of 40 individuals to participate in the program. After graduation he was immediately employed by Aerotek Corporation in Ohio; however, he left this temporary position after one month for a full-time position with Environmental Protection Industries where he is currently employed making approximately \$1500 per week.

Minority Worker Training Highlights

NJ/NY Consortium

The New York District Council of Carpenters, a subcontractor to the University of Medicine and Dentistry of New Jersey-School of Public Health, is the primary training provider and administrator for the program. The NY Carpenters work in collaboration with multiple community based organizations (CBO) to effectively conduct recruitment, social services, referral and counseling for the participants in the program. CBO partners provided state-approved GED classes and other critical support services to their students as well. Many organizations are actively involved in community revitalization and development, including serving as fiscal conduits for the development of affordable housing.

In the current project year, MWT reached out to hundreds of youth in the New York City metropolitan area. Of those, 154 applications were received and were tested for basic math and literacy competencies using the Test of Adult Basic Education (TABE). Of the 154 tested, 63 qualified to participate in the try-outs. Thirty students were selected for the program based on the tryouts. The training program was conducted from November 1, 2006 to March 9, 2007.

Several curricular enhancements have been made during this reporting period. The MWT Program expanded the Introduction to Construction series of workshops to its Life Skills/ Career Guidance component. With this modification, students are exposed to more in-depth information about workplace practices in the building trades, networking, etc., as well as information about the industry overall that included specific information regarding trades other than carpentry. Blueprint Reading has become a permanent part of the construction skills component of the program. MWT expanded its environmental justice curriculum by adding a full-day environmental justice workshop with Michael Lythcott and a field trip to the Gowanus Canal, which is a toxic waste site in a rapidly gentrifying community in Brooklyn, that includes many of the social and health issues raised in the formation of the MWT program at the national level. MWT also continued its diversity awareness workshop in its life skills curriculum.

Of the 30 students enrolled, 26 graduated (87% graduation rate). The Center provided 15 training courses, totaling 14,325 contact hours. A total of 25 graduates are currently working - a job placement rate of 83%. Sixteen students have been accepted into the New York City Carpenters Union. Four students have been placed in Local 3 of the International Brotherhood of Electrical Workers. Additionally, graduates are working in asbestos abatement, machine installation, laborer and shipping, maintenance at the Port Authority of NY and NJ, and at the New York City Parks Department.

Brownfields Minority Worker Training Program Summary

Since 1998, the Brownfields Minority Worker Training Program (MWTP) has successfully trained 3,139 trainees over a ten year period. The overall job placement rate is 69% for a total of 2,153 trainees employed. The Brownfields awardees have done this while continuing outreach to other communities to provide this much needed training opportunity. Wages earned by these workers ranged from \$9.00/hour to an impressive \$28.00/hour. Trainees prior to entering this program were all un-employed or chronically under employed. Now these individuals are employed and giving back to their communities in taxes and community service. During this period, the four BMWTP awardees provided in depth life skills and environmental training to 338 local residents in 10 Brownfields communities. Those cities are Boston, MA; East Palo Alto, and Los Angeles, CA; St. Paul, MN; Kansas City, KS/ MO; St. Louis, MO; Dallas and El Paso, TX; Glen Cove, NY; and Newark, NJ. Of these, 313 participants are now employed, a 81% employment rate. For this period, 236 courses were offered providing 106,262 contact hours of training. Courses ranged from adult cardiopulmonary resuscitation (CPR), basic math, and mold to 40 hour Hazwoper and environmental sampling.

The NIEHS BMWTP has continued to offer comprehensive training to disadvantaged residents and to foster economic and environmental restoration to communities impacted by brownfields. This collaborative effort between the NIEHS and the US Environmental Protection Agency (EPA) via Interagency Agreement has continued to promote the goals of the EPA Brownfields Program that are "to work together in a timely manner to prevent, assess, safely clean up, and sustainably reuse brownfields." Support in the amount of \$2,000,000 for the period of September 1, 2006- August 30, 2007 from the US EPA via interagency agreement (IAG) was provided to the NIEHS to administer the program.



East Palo Alto, CA Hazmat Training

HazMat Disaster Preparedness Training Summary

Hazmat Disaster Preparedness Training Program (HDPTP) enhances the safety and health training of current hazardous materials workers, chemical responders, and skilled response personnel in responding to natural and manmade disasters in a wide variety of high risk settings. The program grows out of role played by NIEHS WETP in the National Response Framework.

The Role of NIEHS WETP in the National Response Framework

The National Response Framework (NRF) is an all-discipline, all-hazards plan that establishes a single, comprehensive framework for the management of domestic incidents. It provides the structure and mechanisms for the coordination of federal support to state, local, and tribal incident managers and for exercising direct federal authorities and responsibilities. The NRF assists in the important homeland security mission of preventing terrorist attacks within the United States; reducing the vulnerability to all natural and man-made hazards; and minimizing the damage and assisting in the recovery from any type of incident that occurs.

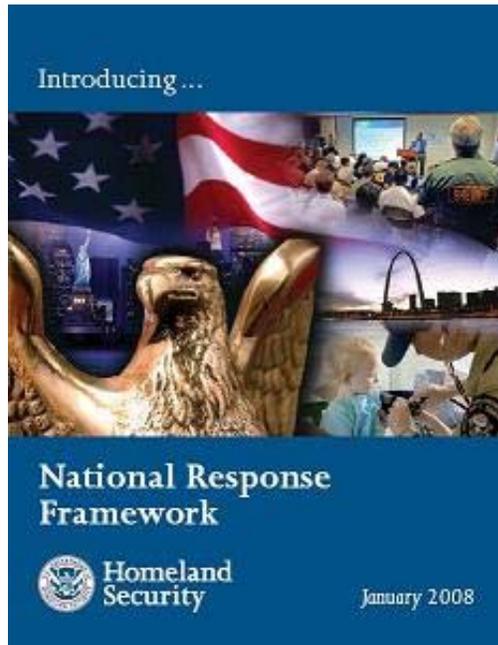
The framework incorporates best practices and procedures from incident management disciplines—homeland security, emergency management, law enforcement, firefighting, public works, public health, responder and recovery worker health and safety, emergency medical services, and the private sector—and integrates them into a unified structure.

The Department of Health and Human Services, which includes the National Institutes of Health and the NIEHS, is a signatory to the NRF. Upon the activation of the NRF, NIEHS may receive a mission assignment from the Federal Emergency Management Agency (FEMA) through the Occupational Safety and Health Administration (OSHA) under the NRF's Worker Safety Health Annex to provide:

- Training technical assistance such as instructional staff, curriculum development experts, subject-matter experts, and professional staff.

Safety training to worker target populations with respect to the nature and location of the incident and the particular hazards. Assistance and support in the development and delivery of site-specific health and safety training through appropriately qualified WETP awardee instructional staff.

- Assistance such as respirator fit-testing and distribution of Personal Protective Equipment (PPE).



NIEHS WETP Awardees Funded under the HDTP Program

- **Center to Protect Workers' Rights (CPWR)**
- **International Association of Fire Fighters (IAFF)**
- **International Brotherhood of Teamsters/National Labor College (IBT)**
- **International Chemical Workers Union (ICWU)**
- **International Union of Operating Engineers (IUOE)**
- **Laborers-Associated General Contractors (L-AGC)**
- **New Jersey/New York Consortium (NJ/NY Consortium)**

HazMat Disaster Preparedness Training Summary con't.

During 2006-2007, the program provided 9292 workers with 100,709 contact hours of training.

The core of the HDPT program is the 16 hour Disaster Site Worker Course and the associated Train-the-Trainer instructor development course. These courses were created in cooperation with the Occupational Safety and Health Administration (OSHA) which also provides certifications for students successfully completing the courses. Examples of course content include coverage of the safety and health hazards at any construction site; the differences in hazards between a disaster site and a construction site; and the ability to inspect, don and doff an air-purifying respirator.

Complete information on these courses can be found at www.osha.gov/fso/ote/training/disaster/disaster.html

Consortium	Courses	Workers	Contact Hours
CPWR	111	1935	22750
IAFF	15	426	4732
IBT-NLC	143	1550	6090
ICWU	22	172	5000
IUOE	48	501	5842
L-AGC	179	1985	32211
NJ/NY	42	585	9768
WRUC	13	213	2104
USW	87	1925	12212
Totals	660	9292	100709

Among other courses offered under the program are Homeland Security Awareness, Industrial Emergency Response Awareness, Emergency Response Basic Operations, Emergency Response HazMat Technician, Emergency Response Awareness, Emergency Response Train-the-Trainer, Emergency Medical Basic and Advanced, Emergency Response for Specific Hazards, CAMEO plume mapping, WMD Hospital Staff Operations, HazMat Transportation Awareness, and Basic First Aid.

Examples of HDPT Training:

“As a result of participating in the IBT-NLC Worker Training Program, 37 workers in the Texas Gulf Coast area acquired Hazardous Materials Transportation Safety and Security Awareness training required by OSHA and DOT, making them eligible to obtain or continue employment in the transportation of hazardous materials to and from the Ports of Houston, Galveston, Texas City, Port Arthur and Beaumont.”

IBT-NLC “What had these rail workers done since the training? Some had responded to emergencies in safer ways. Others had taught fellow rail workers about chemical emergency response, hazardous waste, and other safety and health challenges at their work places. Most had used the resource materials received during training to identify hazards and many had shared these resources in their work place. Many had worked on emergency action plans, on relocating chemicals that were improperly stored, getting windscreens for their yards, instigating formal training, becoming more active in their safety and health committees. All believed that training had made a difference in just the 3 to 15 months since attending the course. A significant number of the responders had hazardous materials exposures. Forty-four percent of those responding had been involved in a hazardous materials release. Over 20 percent had experienced a derailment involving hazmat and almost 20 percent had experienced a hazardous chemical leak. There were also reports of fire or explosion and exposure to dust, gas, fumes, or vapors. Similar follow-up studies will be conducted in subsequent years.”

NJ/NY Consortium member NY Committee for Occupational Safety and Health has continued to train members of the Transport Workers Union Local 100, who work in the subway and bus system who, on September 11, 2001, were some of the first workers to respond to the catastrophe. “Our goal is to prepare as many of these workers as possible to be able to identify hazardous substances that may be part of bio-terrorist activities, and know what actions to take to protect themselves and the public. Our primary targets for the training include jobs that fall into four primary classifications: station cleaners, station agents, maintenance-of-way cleaners, and maintenance-of-way hydraulic/track workers. Some of these employees are assigned to specific subway stations where they are required to clean, sweep, and wash the stations as well as the interiors and exteriors of subway cars. Station cleaners spend their entire shifts in the stations cleaning; station agents are the personnel in the token booths and are often the only personnel with access to telephones. These job titles tend to function as the eyes and ears of the subway stations and ultimately the system.”

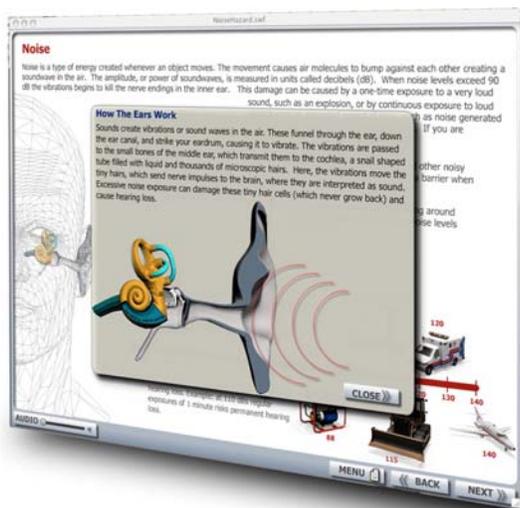
Advanced Training Technologies Program

This program focuses on the development of Advanced Training Technology (ATT) products for the health and safety training of hazardous materials (HAZMAT) workers, emergency responders, and skilled support personnel.

In recent years there have been enormous technological advancements in computer-based technologies and applications. These ATT include a wide variety of electronic learning (e-learning) components. Distance learning, electronic classrooms, interactive TV, multimedia, computer-based training, computer-assisted training, virtual reality training simulations, CD, CD-R, DVD, video teleconferencing, and cell-phone systems, among others, have and are being developed and advanced to support expanding training needs and requirements.

NIEHS intends to build on its program experience in environmental safety and health training by stimulating creative Small Business Innovation Research proposals to create ATT products that will support high quality health and safety training for hazardous materials workers, emergency responders, and skilled support personnel. To further enhance our ability to move toward commercialization of ATT products relevant to model safety and health training for hazardous materials workers, emergency responders, and skilled support personnel, this initiative focuses on the development of technology driven commercial products using the Small Business Innovative Research (SBIR).

Between 2002 and 2006, NIEHS WETP awarded \$3,959,799 under this program. During 2006-2007, NIEHS WETP awarded \$800,000 in total among the following programs. The following project descriptions are provided by the awardee.



Above: Screen Shot from Y-Stress E-learning training product

Web-based Training Center (Phase II) Advanced Technologies Laboratories, Intl. (ATL)

The ATL Web-based Training Center (WBTC) is a fully integrated portal that provides synchronous and asynchronous training from one access point for geographically dispersed students and instructors and is flexible enough to adapt to differing training and learning needs. This portal will be unique in its ability to integrate the asynchronous training functions of a traditional learning management system and a document server/resource center with synchronous features such as web-based conferencing, Voice Over Internet Protocol (VOIP), and desktop/application/document sharing.

Using the WBTC, hazardous materials workers, emergency responders, skilled support personnel and others can receive high quality health and safety training over the Internet that approximates many aspects of traditional classroom training—including the ability to inter-act verbally with the instructor and other students. This is achieved through the implementation of a variety of advanced training technologies including virtual classroom hosting and instructor-led training using VOIP and video conferencing, custom-designed participatory exercises enabled by application sharing, and exercises that combine self-study with group report-back. Through the same WBTC portal they can also access SCORM-conformant self-paced learning modules that complement the instructor-led and other “virtual classroom” course content.

Mobile Just-in-Time Training of Skilled Support Personnel BanDeMar Networks

Skilled Service Personnel (SSP) support emergency response organizations during an emergency incident involving weapons of mass destruction and include laborers, operating engineers, carpenters, ironworkers, sanitation workers and utility workers. SSP called to an emergency incident rarely have recent detailed training on the chemical, biological, radiological, nuclear and/or explosives (CBRNE) agents or the personal protective equipment (PPE) relevant to the incident. This increases personal risk to the SSP and mission risk at the incident site. Training for SSP has been identified as a critical need by the National Institute for Environmental Health Sciences, Worker Education and Training Program and is consistent with its mission to prevent work related harm from exposure to hazardous materials.

The proposed STTR project addresses this SSP training shortfall by exploiting a new training paradigm called just-in-time training (JITT) made possible by advances in distance learning and cellular telephony. BanDeMar Networks and the University of Medicine and Dentistry of New Jersey (UMDNJ) - School of Public Health (SPH) propose to de-

velop a JITT system for SSP who are called to an emergency incident that will provide secure access to information and short (<5 minutes) incident specific learning modules on their cell phones about the hazardous agent(s) involved, the PPE needed and general decontamination procedures for the hazardous agent(s). Learning modules will be designed for cell phone user interfaces and incorporate audio, video, interactive simulations, graphics, animation and assessment. Phase I will investigate the feasibility of a JITT system that operates with most current cell phones over all wireless service providers and that integrates with the incident management system. Phase I will also investigate the instructional design of such over-the-air on demand information and learning modules. Prototypical learning modules and wireless functionality will be developed in Phase I to support field tests with 60 individuals involved in emergency response operations and/or attending hazardous materials courses at the UMDNJ-SPH. Written surveys and personal interviews will be done to evaluate the proposed JITT system information entry ergonomics, authentication and training ergonomics and quality of the over-the-air streaming content. The JITT system will help reduce the potential risk of injury and illness for SSP who are responding to emergency incidents. The JITT system also has great potential for providing JITT for other training needs in public health.

For more information contact: Cesar Bandera, Ph.D., Principle Investigator, cesar@bandermar.com

HAZMAT Training Using a Problem-based Methodology and Serious Games Approach **Information in Place, Inc. (IPI)**

HAZMAT response teams operate in increasingly cognitively complex, mentally stressing, physically fatiguing, and dangerous environments. Yet training needs to include faster and direct access to new technologies, more operations-level training for first responders, and to provide hands-on and in simulated settings. This Phase I effort will focus on examining feasibility in three areas: 1) training methodology; 2) simulation-games approach to HAZMAT training; and 3) instructional design authoring support. This will support the application of advanced training techniques using advanced technologies to develop expertise through complex problem solving for HAZMAT response teams. This will not only impact the type of training being provided currently but will serve as an important model for other areas of HAZMAT training.

To achieve these goals, a combined research design will include both qualitative and quantitative research methods. The overall goal of this research is to determine the effectiveness of the training package developed using the problem-based and simulation-game (S/G) approach. Methods used will include cognitive task analysis with HAZMAT experts, expert reviews of the training package developed, as well as testing the training package with learners to examine complex problem solving and decision making skills.

The relevance of this project to public health is that providing research-based training methods and technologies that not only improves current HAZMAT response teams' expertise in specific situations related to safety and health, but also provides tools to create or modify training to address new threats by creating training that is adaptable and extensible. By providing HAZMAT response teams with advanced training techniques and technologies, Information in Place, Inc. (IPI) aims to increase their expertise, response time, and ability to address increasingly complex situations, such as the ones posed by terrorist threats.

For more information contact: Sonny E. Kirkley, Ph.D., Principle Investigator, sonny@informationinplace.com

Safety E-Minders **Y-Stress Inc.**

Y-Stress Inc., with the assistance of the George Meany Center for Labor Studies - National Labor College (GMC - NLC), proposes to create Safety E-Minders. The human mind can only absorb, retain and retrieve so much information. The more repetitions the better. At the same time, "worker training" implies that they have a job to do and cannot constantly be training. Safety E-Minders is a system that will increase retention of in-class and/or online training information using current technologies, including the wireless handheld mobile devices, to reinforce and remind students of the most critical messages or information to keep the workers and community safe and healthy. The delivery methods will include e-mail, text messages, and voice messages received by the students through computers, PDAs (personal data assistants), and/or cell phones. It will utilize the findings based on current research regarding repetition, retrieval practice, and spacing to maximize learning and retention.

For more information contact: Michael Glassic, Principle Investigator, mglassic@y-stress.com

Intelligent Tutor for WMD EMS Incident Management **Stottler Henke Associates Inc.**

Stottler Henke Associates Inc. proposes to develop EMS/IM ITS, a suite of simulation-based intelligent tutoring systems and scenarios that will enable practice-based learning of WMD emergency medical services incident management principles and skills, including situation assessment, decision-making, and real-time execution of EMS tasks within an incident command structure. To support practical and economical development of many EMS/IM ITS training scenarios, Stottler Henke will also develop software tools and development methods that enable efficient authoring of new scenarios and adaptation/enhancement of existing scenarios by instructors or subject matter experts, without programming. Stottler Henke will leverage their tutoring system development tools and experience developing tutoring systems for medical training, command and control, and tactical decision-making. The National Incident Management System

(NIMS) was mandated to provide a comprehensive, national approach to domestic incident management, so that all levels of government across the nation could work efficiently and effectively together to prepare for, respond to, and recover from domestic incidents. Stottler Henke believes that EMS/IM ITS can contribute to NIMS by providing scenario-based learning of incident management principles for medical first responders, consistent with NIMS, and tailorable via scenario authoring to the specific circumstances and incident management plans of each government organization.

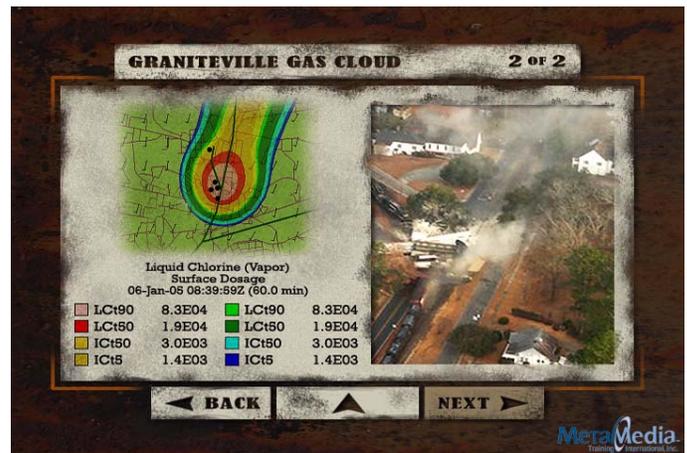
For more information contact: James Ong, Principle Investigator,
ong@stottlerhenke.com

"Lessons Learned from Graniteville" DVD MetaMedia Training

The long-term objective of the proposed research is to better prepare emergency personnel to more safely and effectively respond to rail accidents involving hazardous materials. Approximately 800,000 shipments of hazardous substances travel daily throughout the United States, frequently through densely populated areas where the consequences of an acute release could result in environmental damage, severe injury, or death. MetaMedia Training has teamed with the Rail Workers Hazardous Materials Training Program to research the effectiveness of using an interactive DVD training tool entitled "Lessons Learned from Graniteville." The DVD will provide peer instructors with an interactive tool to facilitate small group exercises on responding to a freight train derailment involving hazardous materials. The DVD will be based on the Norfolk Southern railroad derailment that occurred in Graniteville, SC in January, 2005. The collision released over 11,000 gallons of chlorine gas, causing nine deaths and injuring hundreds. The DVD will bring this catastrophic accident to life in the classroom as part of a facilitated small group training exercise. Interactive DVD represents a technological innovation over traditional training media. It provides a low-cost approach to providing interactive video simulations in the classroom. The commercial applications for the proposed product are widespread.

The audience for the "Lessons Learned from Graniteville" DVD is large. It includes all first responders, skilled support personnel, and rail workers who may be involved in rescue and clean-up operations. Funding for procuring training materials for first responders is now widely available at the local and state level, and there is currently no product that addresses hazmat rail incidents. The proposed research is relevant to public health due to the increasing level of hazardous materials being transported via rail, and the current lack of adequate training materials for emergency personnel responding to such incidents.

For more information contact: Thomas H. Held, Principle Investigator,
theld@metamediausa.com



Above: Screenshot from MetaMedia Training DVD

Online E-Learning Courses for Hazardous Material Workers (Phase 2)

The objective of this proposal is to develop a curricula of role specific online e-Learning courses that meet the needs of a diverse workforce of Hazardous Material workers in the transport modalities of: highway, marine, air, rail, and International. This specifically relates to the goals of the Worker Education Training Program and Health Worker 2010. Hypothesis: Online e-Learning can improve mandated workforce Hazardous Material training by increasing individualization, using the web to simplify dissemination, and shortening time-to-competence, while saving costs. Phase I developed and implemented a highly interactive, e-Learning course, HazMat Truck, and supporting systems. Experts and workers have favorably evaluated the streamlined approach, time-savings, and opportunity to practice designed into the course. Phase II proposes to broaden that study in number and occupation and to develop a curricula of courses with interactivity that addresses the needs of workers in all transport modes. Once finalized, courses will be translated to Spanish and test-marketed. Technological innovation will provide: (1) a curriculum of up-to-date, interactive courses that meets diverse needs, (2) a protocol that matches competency needs to course content, (3) analysis of the efficacy of e-Learning for this population, (4) a customization database that can add state, local, and institution specific requirements to the generic courses. The potential commercial outcome will benefit workers and companies. Millions of people in the US are federally mandated to receive workplace Hazardous Material training, yet often they do not receive it due to time, travel, or language. These courses will solve that. Companies responsible for delivering yearly training could save \$1.4 billion per year in the US and ensure valid, up-to-date training, available anytime, anywhere.

For more information contact: Deborah Marmarelli, Principle Investigator,
dmarmarelli@dcma-us.com

Hazardous Waste Worker Training Program Charts

NIEHS Worker Education and Training Awards For Budget Period 08/01/2006 07/31/2007					
Awardee	HWTP 8/06 Award	HDPT 8/06 Award	SBIR 8/06 Award	MWTP 8/06 Award	8/06 Totals
University of Alabama Birmingham	559,610				559,610
International Chemical Workers Union Council	2,156,622	136,743			2,293,365
International Association of Fire Fighters	799,792	294,742			1,094,534
International Brotherhood of Teamsters	1,681,684	257,526			1,939,210
New England Consortium	1,076,974				1,076,974
Western Region Universities Consortium	1,237,573				1,237,573
Laborers-AGC Education and Training Fund	2,841,137	361,837			3,202,974
United Steelworkers of America Hazardous Materials Training and Research Institute	1,438,094	434,097			1,872,191
Service Employees International Union	596,637				596,637
New Jersey/New York Consortium	922,550	194,076		585,658	1,702,284
International Union, United Auto Workers	769,634				769,634
International Union of Operating Engineers	1,129,877	178,027			1,307,904
Midwest Consortium	1,596,932				1,596,932
Center to Protect Workers' Rights	1,773,504	329,613		653,884	2,757,001
Dillard University				1,277,430	1,277,430
AFSCME Training and Education Institute	502,389				502,389
OAI, Inc.	505,377			983,028	1,486,405
SBIR E-Learning Awards			800,000		800,000
TOTAL	20,165,145	2,410,646	800,000	3,500,000	26,875,791

Hazardous Waste Worker Training Program Charts Con't.

HAZARDOUS WASTE WORKER TRAINING 20 YEAR TRAINING SUMMARY FOR BUDGET PERIOD 09/01/1987 - 07/31/2007			
Year	Total Courses	Total Workers	Total Contact Hours
1988	623	12,319	261,542
1989	1,353	29,827	551,832
1990	5,175	123,358	2,120,390
1991	2,794	58,637	878,673
1992	3,173	65,000	1,100,381
1993	2,751	56,000	789,226
1994	4,083	65,716	1,102,234
1995	4,682	81,245	1,391,440
1996	4,778	73,724	1,087,919
1997	4,231	79,976	1,041,792
1998	4,840	84,261	1,091,932
1999	3,981	74,013	956,251
2000	4,124	75,155	984,350
2001	4,806	79,710	1,031,394
2002	5,298	93,996	1,098,503
2003	5,586	95,265	1,132,682
2004	7,054	124,127	1,222,333
2005	7,662	130,825	1,211,440
2006	6,696	111,872	1,159,651
2007	7,848	131,037	1,425,059
TOTAL	91,538	1,646,063	21,639,024

Hazardous Waste Worker Training Program Charts Con't.

**HAZARDOUS WASTE WORKER TRAINING COURSE
DATA BY EPA REGION
FOR BUDGET PERIOD 08/01/2006—07/31/2007**

EPA REGION	COURSES COMPLETED	WORKERS TRAINED	CONTACT HOURS
Region 9	678	10,750	131,856
Region 7	1,041	15,212	214,034
Region 4	787	12,144	118,008
Region 6	431	8,736	80,981
Region 10	241	3,147	50,964
Region 0	2	34	816
Region 2	1,615	26,582	237,251
Region 5	2,157	39,709	373,023
Region 12	1	35	560
Region 1	294	4,808	69,460
Region 8	202	2,768	40,160
Region 3	399	7,112	107,946
TOTAL	7,848	131,037	1,425,059

Hazardous Waste Worker Training Program Charts Con't.

**NIEHS WORKER EDUCATION AND TRAINING AWARDS
HAZARDOUS WASTE WORKER TRAINING PROGRAM
TOTAL TRAINING (ONE YEAR)
FOR BUDGET PERIOD 08/01/2006-07/31/2007**

AWARDEE	COURSES COMPLETED	WORKERS TRAINED	CONTACT HOURS
INTERNATIONAL ASSOCIATION FIRE FIGHTERS	51	1,167	64,796
INTERNATIONAL UNION OPERATING ENGINEERS	972	17,400	214,604
UNIV OF MED/DENT NJ-R W JOHNSON MED SCH	938	16,211	132,646
UNIVERSITY OF ALABAMA AT BIRMINGHAM	348	6,409	36,431
UNIVERSITY OF MASSACHUSETTS LOWELL	94	1,366	17,156
SEIU EDUCATION AND SUPPORT FUND (ESF)	102	1,606	16,757
UNIVERSITY OF CALIFORNIA LOS ANGELES	210	3,299	39,628
INTERNATIONAL UNION, UAW OF AMER AFL-CIO	115	2,221	12,952
LABORERS-AGC EDUCATION AND TRAINING FUND	487	5,355	130,745
AMERICAN FED OF ST, CO, & MUN EMPLOYEES	124	1,939	11,982
UNITED STEELWORKERS OF AMERICA	420	8,981	88,427
INTERNATIONAL BROTHERHOOD/TEAM/CHAUF/WHM	289	4,380	50,915
CPWR - The Center for Construction Research and	202	3,082	53,748
INTERNATIONAL CHEMICAL WORKERS UNION	262	4,240	44,208
UNIVERSITY OF CINCINNATI	893	16,402	96,522
OAI, INC.	175	2,907	62,688
KIRKWOOD COMMUNITY COLLEGE	2,166	34,072	350,854
TOTAL	7,848	131,037	1,425,059

**APPENDIX 1: TWELVE-YEAR SUMMARY OF TRAINING
NIEHS MINORITY WORKER TRAINING PROGRAM
FOR BUDGET PERIOD 09/01/1996-07/31/2007**

YEAR	STUDENTS TRAINED	PLACED IN JOBS	PERCENTAGE OF STUDENTS PLACED IN JOBS
1996	368	246	67%
1997	310	193	62%
1998	240	154	64%
1999	360	233	65%
2000	364	244	67%
2001	342	204	60%
2002	334	222	66%
2003	310	190	61%
2004	261	219	84%
2005	277	205	74%
2006	333	236	71%
2007	385	241	63%
TOTAL	3,884	2,587	67%

**APPENDIX 2: STUDENT DEMOGRAPHICS
NIEHS MINORITY WORKER TRAINING
FOR BUDGET PERIOD 08/01/2006-07/31/2007**

STUDENTS	385					
AGE	18-25 173	26-35 118	36-45 52	46-55 33	56+ 7	
ETHNICITY	BLACK 345 (90%)	HISPANIC 33 (9%)	ASIAN 2 (1%)	AMERICAN INDIAN 0 (0%)	PACIFIC ISLANDER 0 (0%)	OTHER 5 (1%)
GENDER	MALE 330 (86%)			FEMALE 55 (14%)		
EDUCATION	HS DIPLOMA 227 (59%)		GED 90 (23%)		NO GED 68 (18%)	
UN OR UNDER EMPLOYED¹	UN 336 (87%)			UNDER 49 (13%)		

¹Employment status at entry into the program.

**APPENDIX 3: PERCENTAGE OF STUDENTS PLACED IN JOBS
 NIEHS MINORITY WORKER TRAINING PROGRAM
 FOR BUDGET PERIOD 08/01/2006-07/31/2007**

AWARDEE	STUDENTS TRAINED	PLACED IN JOBS	PERCENTAGE OF STUDENTS PLACED IN JOBS
CPWR - The Center for Construction Research and Training	74	48	65
Dillard University	126	70	56
NJ/NY Hazardous Materials Worker Training Center	30	24	80
OAI, Inc.	155	99	64
TOTAL	385	241	63



Photographs: UMDNJ Minority Worker Training Program Students

**APPENDIX 4 - SUMMARY OF TYPE AND NUMBER OF COURSES
NIEHS MINORITY WORKER TRAINING PROGRAM
FOR BUDGET PERIOD 08/01/2006 - 07/31/2007**

COURSE NAME	NUMBER OF COURSES
Adult CPR	9
Asbestos Abatement Supervisor	1
Asbestos Abatement Worker Basic	14
Asbestos Abatement Worker Refresher	5
Asbestos Awareness	3
Basic Construction Skills	20
Basic Electrical Training	1
Basic First Aid	9
Basic Math Skills	16
Basic Reading/Writing Skills	10
Basic Superfund Site Worker	19
Blueprint Reading	1
Computer Skills	10
Confined Space	7
Environmental Justice	6
Environmental Preparation	2
Environmental Sampling	1
Gen. Industry Safety	5
General Construction Safety	11
HazMat Transporter/Basic	1
Industrial Emerg. Resp. Awareness	2
Lead Abatement Supervisor	1
Lead Abatement Worker Basic	11
Lead Abatement Worker Refresher	4
Lead Awareness	3
Mentoring/Career Guidance	20
Microbial Remediation: Mold and Mildew	13
Physical Fitness	13
Scaffold	2
Site Supervisor Basic	1
Site Worker Refresher	2
TOTAL	241

**APPENDIX 5: TOTAL COURSES, STUDENTS, AND CONTACT HOURS
 NIEHS MINORITY WORKER TRAINING PROGRAM
 BUDGET PERIOD 08/01/2006-07/31/2007**

AWARDEE	COURSES COMPLETED	STUDENTS TRAINED	CONTACT HOURS
NJ/NY Hazardous Materials Worker Training Center	15	30	14,325
CPWR - The Center for Construction Research and Training	48	74	26,130
OAI, Inc.	99	155	36,863
Dillard University	79	126	30,271
TOTAL	241	385	107,589