

**July 1, 2003**

***NIEHS/DOE Hazmat Worker Training Program  
FY 2002 Accomplishments and Highlights:***

**Submitted by the  
National Institute of Environmental Health Sciences  
Division of Extramural Research and Training  
Worker Education and Training Program  
Research Triangle Park, NC**

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**FY 2002 Accomplishments and Highlights:  
NIEHS/DOE Hazmat Worker Training Program**

**1.0 Introduction**

The National Institute of Environmental Health Sciences (NIEHS) and the Department of Energy (DOE) are committed to protecting the health and safety of the tens of thousands of people working to clean up hazardous materials throughout the DOE nuclear weapons complex. Since 1993, this commitment has been manifested through Interagency Agreement with the DOE that allows the NIEHS Worker Education and Training Program (WETP) to administer a training grant assistance program consisting of cooperative agreements with 8 primary awardees. These awardees provide general and site-specific health and safety training that ranges from basic hazardous waste operations and emergency response (HAZWOPER) courses to asbestos and lead abatement, confined space, hazard communication, respirator, radiation, and general industrial safety courses.

Today, the DOE is making a transition to an accelerated risk-based cleanup strategy and striving to achieve the goal, stated by Assistant Secretary Jessie Roberson, of reducing or eliminating risk to workers, the public, and the environment by 2030. The NIEHS WETP is proud to join the DOE in this effort. This report summarizes the work NIEHS/DOE awardees have performed during FY 2001-2002. It also includes updates on additional NIEHS WETP activities: the Small Business Innovative Research program, National Clearinghouse for Health and Safety Training, World Trade Center response supplements.

Since September 11, 2001, the NIEHS WETP has been in the process of evaluating its organizational capacity to respond to future terrorist events. This is documented in a number of reports that are listed in the appendices. It is clear that the response to chemical, biological, radiological and nuclear weapons requires a pool of skilled workers from many trades who have the training and certifications to perform safely in hazardous situations. Through the WETP Hazardous Materials Worker Training Program awardees (18 consortia with over 80 member organizations), their members and the workers they train, such a pool does exist. In terms of radiological threats, the same can be said of the NIEHS/DOE program. In case of an actual radiological event, the NIEHS/DOE program represents the largest pool of trained, certified workers available. It also provides a mechanism for identifying and mobilizing these workers. While it was never imagined that this program would result in a capacity to respond to terrorist events, this is an actual benefit and a national security asset.

There are several other themes that emerge from the activities of the NIEHS/DOE awardees. Foremost of these is their promotion of Integrated Safety

Management (ISM), working with employers to incorporate ISM into the courses offered. Another theme is the special effort being made by the awardees to meet the needs of a changing workforce and overcome language, cultural, and educational barriers. And finally, there is a theme of consistency and continuity that this training service provides to the DOE family, both DOE employees and contractors. While these themes are not broken out into special sections, they do receive emphasis within the body of each awardee's progress report.

Mr. Paul Golan, Chief Operating Officer, DOE Environmental Management Program, recently suggested that a program is most effective when it is run "as a project" with clear goals, schedules, and outcomes that can be evaluated. The NIEHS WETP is committed to administering just such a "project," and it is hoped that this report will assist the reader in understanding this important national resource - the NIEHS/DOE Hazmat Worker Training Program.

## **2.0 2001-2002 Program Highlights: Progress to Date**

In completing the ninth year of the NIEHS/DOE Worker Education and Training Program (September 1, 1993 to August 31, 2002), the NIEHS has successfully supported eight primary awardees. Across the DOE complex, the NIEHS awardees have trained nearly 147,000 workers and presented over 8,000 classroom and hands-on training courses, accounting for 2.2 million contact hours of actual training at an average cost of \$37.38 per contact hour (see Appendix 1).

Through an Interagency Agreement, NIEHS received \$8.5 million from the FY 2001 DOE appropriations, which provided funding to NIEHS awardees during the past year (September 1, 2001 – August 31, 2002). Of the FY 2001 funds, \$8.1 million was allocated to continue support of the NIEHS/DOE Worker Training Program to provide safety and health training across much of the DOE complex (see Appendix 2).

Between September 1, 2001 to August 31, 2002, the eight primary worker training awardees and more than thirty sub-awardees delivered 1,954 courses, reaching 25,399 workers, which account for 302,640 contact hours of health and safety training at an average cost of \$26.69 per contact hour (see Appendixes 1 and 3). This training ranged from 4-hour refresher programs through more complex train-the-trainer courses lasting up to 120 hours. Fifty-three percent of the training has been focused on delivering basic HAZWOPER cleanup worker training. This comprises 11,373 workers who received 80-hour training, basic 40-hour training, or 4-8 hour refresher courses (see Appendix 4).

While the DOE/NIEHS awardees have provided training at more than 27 DOE sites during the past year, most of the training provided was at two of the largest DOE sites, Hanford and Oak Ridge. Between the two sites, 1,008 (42%) courses

were delivered, reaching 13,328 (42%) workers, which account for 141,985 (47%) contact hours of training (see Appendix 5).

### **3.0 Continuation of the Peer-Reviewed DOE Worker Training Awards for FY 2002**

After completion of the third program year of the projected five year long cooperative agreements, eight organizations submitted progress reports, training data, budget requests, and training plans on July 1, 2001. Budget adjustments in the proposed funding plan were based on the training needs of high-risk populations, national geographic coverage in training availability, and the published program priorities for training support. Awards were then made on September 1, 2001 for each of the programs supported with DOE Environmental Management resources. These awards ran through August 31, 2002.

### **4.0 NIEHS/DOE Awardee Progress Reports.**

The following are highlights that describe the Training Activities Carried Out by the NIEHS/DOE Worker Training Awardees.

#### **4.1 Center to Protect Workers Rights (CPWR)**

The Center to Protect Workers' Rights (CPWR) and its Construction Consortium for Hazardous Waste Worker Training was created to support the Building and Construction Trades Department, AFL-CIO (BCTD) and its affiliates with their safety and health research and training needs. CPWR's Consortium includes the following international/national construction unions: Insulators & Asbestos Workers; Painters; Boilermakers; Plasterers & Cement Masons; Bricklayers; Plumbers & Pipe Fitters; Carpenters; Roofers (AHOHC); Electrical Workers; Sheet Metal Workers; and Iron Workers.

By the end of the 2001 / 2002 grant year (ending August 31, 2002), CPWR and its consortium partners delivered 411 courses (this includes an adjusted projection using carryover funds), for a remarkable completion rate of 99% of projected training. Participating in these training programs were 6,054 construction workers, technicians, support staff and other workers. Contact hours of training equaled over 60,000, 103% of projected hours. These figures include training conducted directly by CPWR, and by CPWR's sub-grantees and partners.

During this year, CPWR continued developing Spanish language information materials that are posted on their safety and health web site: the Electronic Library Of Construction Occupational Safety And Health ([www.elcosh.org](http://www.elcosh.org)).

Additionally, CPWR is in the process of adapting the Building Trades' OSHA 10-hour course, called "SMART MARK," into Spanish, for use with Spanish speaking construction workers who, unfortunately, are at higher risk for occupational safety and health injuries in the construction industry.

CPWR also placed greater emphasis on literacy issues this year. CPWR's Train-the-Trainer curriculum now includes training components describing strategies trainers can use to enhance the learning of individuals who may not have high levels of literacy. As part of their on-going instructor development/enhancement activities, CPWR trainers are encouraged to develop and use strategies that promote group participation, team-work, joint problem solving and other methods that help guarantee learning among individuals with low literacy levels. CPWR trainers are made aware that over one-third of U.S. workers have difficulties with reading and writing, and that most health and safety materials are written at a college reading level. CPWR trainers are instructed to be careful about asking someone to read from a paper, flipchart, overhead transparency or other printed material. While conducting group work, instructors are asked to read the instructions aloud to be sure that everyone understands what they are supposed to do. Usually the instructor will ask that each group select a recorder who enjoys writing, thereby removing any likelihood that a non-reader will be asked to write. A key value in using small group activities is that limited-proficiency readers can participate in the group discussions and are able to contribute to the collective knowledge and problem solving of the group. In addition, the heavy emphasis on hands-on training allows limited proficiency participants to get the full value from the training. Participatory training techniques help insure that all participants acquire the skills and knowledge to protect themselves in hazardous situations.

Combined, over 60,000 contact hours of critical health and safety training were delivered to construction and other workers working, or potentially working at DOE facilities. Through this cooperative agreement with NIEHS, they have responded to the safety and health training needs of 11 of the 15 international unions representing construction craft workers in the United States. The fluctuations in market conditions have driven the specific types and amounts of training demanded by their target population in this year. For example, they responded to a significant increase in confined space and OSHA 10-hour courses. While training needs have fluctuated, they have been in position to respond accordingly, and, with the resources under this agreement; they have met their training goals and the demands of their target population. CPWR's ability to meet the ever-changing training needs of construction workers employed at various DOE facilities is the strength of the program.

As with all NIEHS/DOE awardees, CPWR makes a considerable effort to evaluate the effectiveness of their program and its courses. The improvements made to overcome cultural, language, and educational barriers are a result of their evaluation work. CPWR also has evaluated a broader question: Are the workers and managers being trained actually in need of the training? And if not

currently, will they be using the training? They did this by collecting work-site and exposure history information from a sample of trainees. In one survey 950 of the 1,082 respondents reported that they had indeed done work at a hazardous waste site, and 751 of these had actually worked with the hazardous waste itself. In another survey, 71% of the respondents worked in hazardous waste areas with 44% of the trades people and 40% of the managers working regularly (more than 10 times) in such areas. Thus, it is established that the participants enrolled are clearly people in need of the training.

Finally, telephone interviews were conducted with trainees six to eight months after they had completed training. Respondents rated their training as very understandable and relevant. Approximately two-thirds of the trainees had worked in an area that the training prepared them for, or in a related area and used class related skills and knowledge. A group of eleven questions was asked to measure the effectiveness of the training in producing workplace competence. Trainees who had taken the Hazardous Waste Refresher classes indicated averaged ratings of 4.3 (trades people) to 4.2 (managers/professionals) on a 5-point scale for these questions, strongly supporting the conclusion that CPWR trainees are well prepared to work safely in hazardous workplaces.

## **4.2 Hazardous Materials Training and Research Institute (HMTRI)**

The Hazardous Materials Training and Research Institute (HMTRI), sponsor of the Community and College Consortium for Health and Safety Training (CCCHST), supports universities, colleges and community training providers serving Department of Energy (DOE) environmental restoration and waste management sites. CCCHST-DOE provides convenient, consistent, and cost-effective, NIEHS-approved worker training to DOE, contractors, subcontractors and public officials serving DOE facilities. Current CCCHST-DOE members are located at the following educational institutions serving their respective DOE facilities: Aiken Technical College at the Savannah River Site, SC; Amarillo Community College at the Pantex Plant, TX; University of Tennessee, Knoxville, TN at the Oak Ridge Field Office Sites, as well as Paducah, KY, and Portsmouth, OH.

CCCHST-DOE trained 1028 students for a total 17,163 contact hours of instruction. The University of Tennessee delivered 696 course hours to 272 students for a total 3,374 contact hours of instruction. Training was provided for the Oak Ridge complex, Portsmouth Gaseous Diffusion Plant, Paducah Gaseous Diffusion Plant, and facilities managed by the Rocky Flats Office in Colorado. Amarillo Community College delivered 755 course hours to 739 students for a total 13,361 contact hours of instruction at the DOE Pantex facility in Amarillo, Texas. CCCHST members located near INEEL in Idaho and the Savannah River Plant in South Carolina offered smaller numbers of courses.

The audience for HMTRI's training is dominated by students who need a Waste Site Worker course immediately and cannot wait for a regularly scheduled traditional class. Thus, HMTRI specializes in web-based instruction supplemented with instructor led hands-on training. Once students begin the web course, they like the flexibility of the learning environment. Some complete the course at work, some at home, and some at a college-learning center. In addition to their Hazwoper-on-the-Web course, HMTRI has converted its Waste Site Worker Refresher for web-based delivery and developed a 24-hour moderate-risk waste site course for workers who enter a site occasionally for specific limited tasks and are unlikely to be exposed to over-permissible exposure limits.

Are students satisfied with this web-based, blended learning approach? As part of HMTRI's evaluation process, students were surveyed and responded as follows:

- To the statement, the on-line network environment/software was user-friendly, 18% strongly agreed, 36% agreed, 27% were neutral and 18% disagreed. No one strongly disagreed.
- To the statement, the on-line course was as good or better than a conventional classroom course, 8% strongly agreed, 73% agreed, no one was neutral and 18% disagreed. The results were similar for the statement, I believe I learned as much in this class as I would have in a traditional version of this class.
- Interaction with the instructor was minimal, based on the survey results during the on-line portion of the course, and good to excellent in the hands-on portion of the course. The majority would like more instructor interaction at the start of the course.
- Summarizing students overall opinion of the course, 9% felt it needed improvement, 36% thought it was O.K., 36% thought it was good, and 18% thought it was excellent. No one thought it was poor.

HMTRI measures the effectiveness of the overall project in several ways including: (1) hands-on and electronic testing of students, (2) electronic course evaluations completed by students, (3) student tracking and follow-up to demonstrate that training protects workers, employers and the environment, (4) employer follow-up to verify that students have required skills and knowledge, that competencies gained through 1910.120 training are applied on the job, and that management has implemented and/or enforced health and safety measures in the workplace.

During this year, Hazwoper-on-the-Web translations to Spanish were completed. The Spanish audio was transcribed to Spanish text so that Spanish or English text can be displayed with the Spanish audio. This allows workers to read along with the audio. If a student is hampered by a slow Internet connection or by a

computer without audio capabilities, the worker can alternatively read the information presented in the audio.

For each of the 18 lessons that make up Hazwoper-on-the-Web, the lesson overview, the objectives, and knowledge pages have been translated into Spanish. Links to Spanish language web sites are also included such as the Spanish version of OSHA's Plain Language workplace poster. Over 800 entries in the course glossary have been translated into Spanish.

Currently, HMTRI is converting existing hazardous materials curriculum to an open-entry, open-exit format to be electronically delivered to students by CCCHST-DOE colleges. Member colleges will complement curriculum with required hands-on training and local instructor support to students. This will provide additional flexibility in meeting their five-year goal of training a minimum 1,500 workers, technicians, and supervisors to protect themselves, their facilities, and their communities from exposure to hazardous materials encountered during hazardous waste site clean-up, in the transportation of hazardous materials, and in the response to releases of hazardous materials.

### **4.3 International Association of Firefighters (IAFF)**

The IAFF/DOE program has two aims:

- To determine the specific needs of fire service personnel in and around DOE facilities, conduct appropriate training, and evaluate the results of training.
- To build local institutional capacity by training qualified instructors at each location to continue hazardous materials training beyond the completion of the IAFF/DOE Cooperative Agreement.

A total of 555 people were trained during the FY 2002 IAFF/DOE project through August 31, 2002. These students were trained during 11,416 contact hours at 27 separate courses. The DOE sites served were Hanford, Savannah River, Oak Ridge, Rocky Flats, Lawrence Livermore, Nevada Test Site, Argonne National Labs, West Valley, Yucca Mountain and Sandia National Laboratories.

The training conducted focused on eight hazardous materials emergency response levels. The courses included Hazardous Materials Instructor Training, First Responder Operations, Confined Space Operations, Incident Management, Clandestine Drug Labs, Radiation, and Technician. Instructor development courses included Hazardous Materials Instructor Training, First Responder Operations, Confined Space Operations, Incident Management, Clandestine Drug Labs, and Radiation.

Also during the year, three other activities stood out:

1. The IAFF increased the number of Instructor Training events over the previous year. Through August 31, 2002, the IAFF delivered five Instructor Training events to almost 100 new fire service trainers at or around sites in the DOE nuclear weapons complex. It is estimated that over 4,500 students will receive First Responder Operations training annually, based on the Instructor Training events conducted this year.
2. The IAFF renovated its web site ([www.iaff.org](http://www.iaff.org)) to provide training guidance, programs to download and up-to-date case studies for inclusion in field training events. This year, the IAFF had five online learning modules and 20 web-based case studies for inclusion in the lesson plan during course delivery. Also, the Technician program was released with DVD/CD ROM media format.
3. The IAFF made significant progress in revising several key courses for emergency responders. The revisions incorporated interactive learning and the Small Group Activity (SGA) methodology into digital media technologies (e.g., CD ROM, PowerPoint, etc.). Furthermore, the DOE project remained critical in the IAFF effort to create program delivery and distribution efficiencies through digitized media.

The IAFF took a great deal of care in evaluating their audience and their training needs. The IAFF provided a training service to small, local fire departments, and most of the training was actually delivered in the requesting fire department facility. Thus, the vast majority of IAFF/DOE trainees were fire fighters (86%). The next largest group trained was law enforcement, specifically police officers at 5%. Local events generally target new recruits and those who have not benefited from several years in the fire service. The largest segment of trainees, 27%, was new to the fire service and did not have on-the-job experience; and a majority of the students had not been trained to the HazMat First Responder Operations level or higher. It is also significant that almost half (44%) of the trainees had never conducted pre-planning activities and that less than half of those trained (41%) are ever involved in practice drills at target sites in their response area. Likewise, only 4% of the IAFF/DOE students ever had the opportunity to practice emergency response to a site in the DOE nuclear weapons complex.

There are specific barriers to providing training to volunteer fire fighters because the majority of the target audience has a primary occupation other than the fire service and cannot participate in training that extends beyond a weekend. In response to this, the IAFF has succeeded in adapting a regional Instructor Training format to accommodate responders at a given site, as well as those in surrounding communities. These events demonstrate the IAFFs desire to provide this needed training in the format most convenient for the affected emergency response groups.

#### **4.4 International Chemical Workers Union (ICWU)**

The ICWUC Center for Worker Health & Safety Education is operated as a consortium in cooperation with the International Association of Machinists and Aerospace Workers (IAM). Training was delivered at three DOE sites: Kansas City, Oak Ridge, and Hanford through the Hammer facility. Training consisted of 40-hour Emergency Response classes, 24-hour Treatment Storage and Disposal classes, 8-hour refreshers, as well as a class to bridge the 24-hour class into a 40-hour class. Given the needs of each site contractor, the majority of the classes fell into the 8-hour refresher category. Total training numbers for the grant year (September 1, 2001 through August 31, 2002) were 2,297 trainees (20,647 contact hours) in 192 classes.

The ICWU program is based upon a solid Integrated Safety Management (ISM) foundation. Basically, ISM states that safety awareness and good work practices are integrated. Each DOE site has an ISM program and ICWU has tailored its training to incorporate this. Key to ICWU activities is the ISM principle: "Personnel shall possess the experience, knowledge, skills and abilities that are necessary to discharge their responsibilities."

At Oak Ridge, Hanford, and Kansas City, ICWU maintained a core group of experienced on-site trainers. Overall there are 26 trainers with up to nine years of experience. The trainers are thus experienced in their field and very familiar with each site and its specific training needs. This results in a training program that is reliable, has continuity year after year, and yet is flexible in that training can be and is modified to meet changing conditions.

At each site, ICWU provides an On Site Coordinator to work daily with contractors, coordinate all training, meet logistical needs, and answer management and local union questions. All three on site coordinators at the training sites are active trainers who bring valuable experience and information to ensure quality training is delivered.

Thus, the ICWU is successfully meeting the requirement at all DOE sites to yearly revise the refresher program at each site, as each year, the same work force personnel participate in the annual refreshers.

Another example of ICWU flexibility is their effort to better accommodate the needs of the Hammer facility by developing a compressed class designed to fulfill the training needs of the prime contractors while minimizing the number of trainers needed to complete all programs. This is a cost-effective method of minimizing the number of set up days and the total number of trainers needed to deliver a 40-hour course, a 24-hour class and a bridge CERCLA course. By combining these classes in this fashion smaller numbers are needed to keep the cost per training hour to a minimum. Hanford also offers the standard 24-hour

Treatment, Storage, and Disposal class as well as the regular 40- hour class when there is a need.

ICWU has also taken a proactive approach to literacy issues. Since it is often difficult to determine if a participant has a literacy problem, ICWU developed all of its modules to be interactive so that these participants can learn material without being singled out. Instructors learn to read the text of problems and questions to ensure all participants fully understand the material. Also, by encouraging participants to work together in groups, their ability to work together with others upon returning to their work sites is enhanced.

One tool ICWU used to measure training effectiveness is a review game called "HazMat Pursuit." This review uses a game board with colored spaces; all questions are read aloud so as not to embarrass someone who has reading difficulties. If a participant does very well during this exercise and then does very poorly on a written test, the trainer is alerted to a possible literacy problem and additional steps can be taken to address it.

Evaluation of training effectiveness was done in a number of ways including pre and post testing. ICWU worked closely with DOE to develop tests that are consistent with DOE regulations and orders. These include wording of particular questions, ensuring similar but not identical questions in key subject areas and other methods to vary pre and post questions.

Pretesting showed that the amount of pretest knowledge of participants is slightly increasing. This effect is to be expected at DOE sites where ICWU conducts annual refreshers over an extended period. However, pre-training scores from multiple day courses at most sites in topic areas related to chemical protective clothing, respirators, decontamination, and labels and placards continued to show a significant training need. This is also to be expected since these participants are either newly hired or have not been in jobs that mandated yearly refreshers. With the DOE and contractor mandate to conduct individual testing for initial training, ICWU implemented methods to remediate any participant who did not have the passing score of 80% and avoid any perception of "job jeopardy".

Finally, ICWU does ongoing analysis and monitoring of scores as an effective quality assurance tool. The results are particularly helpful in revising courses to focus on areas where there is a need for greater emphasis.

#### **4.5 International Union of Operating Engineers (IUOE)**

"This training out did any that I received, the instructor's pace made the subjects easy to grasp and understand... best 8-hr refresher yet-didn't dwell on redundant subjects..."

This is a typical comment from an IUOE trainee and underscores the IUOE 's ability to achieve a high level of student involvement and enthusiasm during instruction. This parallels one of the critical elements of the DOE Integrated Safety Management (ISM) effort: the involvement of workers. For this involvement to be effective, workers must be trained in hazard assessment techniques and in general concepts of worker protection. During FY02 therefore, the IUOE provided important support to the ISM program through broad safety and health training at a number of DOE sites, particularly Oak Ridge, Idaho National Engineering and Environmental Laboratories (INEEL), and Hanford.

The IUOE training program was built upon the high quality of its instructors and worker-trainers. This diverse group of Health and Safety Professionals and Certified Instructors developed, conducted, and sustained the program. These are Master Instructors who receive hundreds of hours of initial Train-the-Trainer instruction in addition to regular Master Instructor refresher courses.

During the past year, these instructors were responsible for training 2,345 individuals for a total of 24,872 contact hours. The courses taught included the; 40-Hr Basic Superfund Site Worker, 8-Hr Site Worker Refresher, 8-Hr Site Supervisor Basic, and the 24-Hr RCRA TSD Site Worker.

The IUOE follows the Direct Training Approach, emphasizing hands-on, participatory instruction, but they also utilize the best e-learning resources. For example, the program produced several computer-based courses aimed at technical issues and a web-based radiological protection course.

In evaluating training effectiveness, IUOE uses a number of techniques: questionnaires, course evaluation forms, pre and posttests and training verification forms. The training course evaluations are reviewed for comments concerning course improvement, instructor critiques, workplace experiences, and personal suggestions. The participant questionnaires identify information about exposures in the workplace to determine if training in worker protection for the specific hazard is required, or if the existing training is sufficient to reduce worker exposures to these hazards. The participant questionnaire collects the following information from their students: Exposures to contaminants such as asbestos, lead, asphalt fumes, welding fumes, and solvents; Extent of work on hazardous materials job sites; Extent of respiratory protection use; Extent of site-specific training; Type of EPA hazmat sites worked; DOE hazmat sites worked; Extent of improvements in worker protection and training; and Race, gender, education level, and employment status.

As a direct result of student evaluations, IUOE has reduced course content redundancy, reduced and rescheduled testing while maintaining learning objectives and course integrity, and redesigned practical exercises to more closely mirror activities commonly performed at various DOE Facilities.

Finally, IUOE is another NIEHS/DOE awardee that is directly addressing the issues of culture, language, and adult literacy. In terms of adult literacy, the IUOE strives to discreetly identify those with reading comprehension difficulties and provide the individual attention required to assure a successful training experience. Examples of commonly used practices to resolve the problem include increased student/teacher interaction, class discussions, use of training videos, and oral administration of tests. The IUOE continued its Hispanic Outreach initiative, which addresses language issues for Latinos interested in learning to operate heavy equipment.

#### **4.6 Laborers Associated General Contractors Education and Training Fund (L-AGC)**

The Laborers-AGC Education and Training Fund (L-AGC) as the prime awardee and the International Brotherhood of Teamsters (IBT) as a subawardee train workers who are, or have the potential to be, employed on demolition, decommission, and decontamination projects at the DOE nuclear weapons facilities. Training was provided primarily to Laborers and Teamsters but also included members of other building trades when appropriate or necessary. This effort resulted in conducting 576 courses for 6,372 workers for 121,733 total contact hours during the past year. Courses were conducted at 12 DOE sites and at DOE headquarters. These courses included basic and advanced radiation worker, asbestos abatement worker and supervisor, respiratory protection, basic superfund site worker and supervisor, hazmat transportation awareness, general construction safety, fire watch, cutting and burning, rigging and signaling, fall protection, and scaffolding.

The September 11 terrorist incidents in NYC and Washington, DC, and subsequent anthrax mailings, created a new training need, especially in the Washington, DC metropolitan area. DOE Headquarters had cooperated with various law enforcement agencies to provide HW Operations/Anthrax training to law enforcement personnel. Special permission was given to L-AGC to conduct this training under the DOE Headquarters grant program. Course materials were modified somewhat to take into consideration the special circumstances that law enforcement personnel may find themselves in, including hostage situations, encounters with unknown substances, and the use of firearms. Training was provided for the DC Metropolitan Police SWAT teams, the US Marshals, the Capitol Police, the US National Park Police, and various other federal agencies. There continues to be demand for this training, which is being coordinated through the WV Mobile Training Unit.

During the 2001-2002 program year, a number of topics received additional attention from L-AGC/IBT. This included initial discussions on preparation and training needed to address potential terrorist acts; the medical clearance for trainees; the translation of course materials into Spanish and other languages;

and an analysis of the 80-hour HW Worker course with regard to modularization and allocation of time among various training topics including site-specific training as an option for inclusion in the course to tailor it to specific DOE site needs.

L-AGC/IBT also held an annual Instructor Development Program (IDP) for all instructors to learn new teaching methodologies, acquire updated information and skills in construction and environmental remediation, and to create and use more effective teaching tools and materials.

Considering the hundreds of classes and thousands of students spread over the entire DOE complex, it is fair to ask: How does L-AGC/IBT keep track of each student? And how do they evaluate the content and effectiveness of each course?

In the first place, information on work history, skills used, problems encountered and responses to those problems are provided by each trainee when they apply for a course. This assists in tailoring each course to the actual students being enrolled.

Then various records are kept on each trainee throughout the duration of the course. These records help track the progress of the trainee, monitor his/her performance, and document completion of course tasks. For the hands-on portion of the course, records include:

1. Trainee record sheet for pulse, temperature, and weight;
2. Trainee fit test record;
3. Performance test observation form for inspecting and donning half-face air purifying respirators (APRs);
4. Performance test observation form for inspecting and donning full-face APRs;
5. Performance test observation form for doffing and cleaning APRs.

Trainees are also given standard operating procedure (SOP) sheets to complete on the mock hazardous waste site. The SOP sheets detail procedures trainees would see on a hazardous waste site. Instructors monitor these activities and evaluate each trainee's ability to complete these assignments in a proficient and safe manner.

As mentioned above, L-AGC/IBT utilizes a sophisticated application and survey form. The form has questions about the trainee's characteristics (age, race, gender and home state) and hazardous sites where the trainee has been employed during the past year. It also includes questions about skills and job problems identified as most useful or problematic in the past two years.

The refresher application is also used as a training tool. Trainees are asked about their job experiences and encouraged to discuss any health and safety

problems they have encountered on hazardous waste sites and, then, for other construction sites. Each incident is used as an example of job site hazards and is discussed by the class to identify the problem and the possible responses that are appropriate for the situation. During this discussion, the instructor takes notes. At the end of the course, the instructor writes a summary of the class discussion and submits it to L-AGC. This gives them another method of identifying problem situations workers encountered at hazardous waste sites and helped to evaluate the appropriateness and effectiveness of training.

Finally, the trainee's mastery of course material is evaluated in two basic ways: classroom and hands-on activities performance and administration of a final course exam.

The attention and care that both L-AGC and IBT take in evaluating training needs and in delivering the instruction has resulted in very high completion rates for their classes. This translates into a better prepared, knowledgeable, and therefore safer DOE workforce.

#### **4.7 The New Jersey/New York Hazardous Materials Worker Training Center (NJ/NY Consortium)**

The New Jersey/New York Hazardous Materials Worker Training Center consists of the University of Medicine and Dentistry of New Jersey - School of Public Health that provides training, as requested, to Brookhaven National Laboratory and Princeton Plasma Physics Laboratory employees; and the University at Buffalo that provides training to employees at West Valley Nuclear Services. Each institution also provides flexibility in their training programs to accommodate additional training needs that arise each year.

During the year, the New Jersey/New York Consortium Training Center has provided 100 courses for a total of 802 workers trained, corresponding to 8,628 contact hours of training.

A number of activities during the year deserve highlighting:

- At Brookhaven National Laboratory, personnel from the industrial hygiene, environmental remediation, reactor, waste management and other departments were trained. This included 40 hour HAZWOPER, 8-hour Supervisor, 8-hour Annual Refresher, 8-hour Hazardous Materials Transportation, asbestos refresher courses, Operations and Maintenance Refresher, and Worker/Handler Refresher.
- At Princeton Plasma Physics Laboratory, personnel from the environmental remediation, emergency services and industrial hygiene

divisions were trained. Over the past year, employees participated in the 40-hour course, 8-hour Supervisor course, 8-hour Annual Refresher, Asbestos Inspector, and Asbestos Contractor/Supervisor Refresher.

- At the West Valley Demonstration Project facility, (WVDP) personnel participated in 24-hour Hazardous Waste Worker Courses, 8-hour Hazardous Waste Worker Refresher, Emergency Response Operations, 16-hour "Bridge" Courses site personnel to upgrade their 24-hour HAZWOPER status to 40 hours, RCRA-TSD Refreshers, and Supervisor courses.
- The Center also spent considerable time working with WVDP personnel developing a completely new 8-hour refresher course for the next year that will complete training requirements for both 24-hour and 40-hour Initial trained workers.

The Center has a very sophisticated evaluation system. It begins with a comprehensive computerized database. This is utilized by the evaluation team members who are experienced in statistics, computer programming, and study and instrument design. They also have experience in qualitative and quantitative data collection and analysis. They have also published the strategies employed by the Center so that others involved in health and safety training can adapt existing methodologies.

Data on prospective trainees are collected using a scannable registration form that includes variable categories and subcategories used in the database for the NIEHS Worker Training Grant programs. All trainees use registrations to record name, address, phone number, Social Security number, birth date, gender, ethnicity (Caucasian, African American, Native American, Hispanic, Other), primary language (English, Spanish, other), education (no high school certificate, high school certificate, some college or votech training, college/votech graduate, some graduate school, graduate degree obtained), job title (scientist, engineer, etc.), job setting (hazwaste site, generation facility, storage facility, transportation, etc.), primary job duty (clean-up, TSD, etc.) and work sector (public sector, private industry, etc.). Multiple employment variables (job duty, setting, and title), with education data, enable a more exact determination of trainees' job category. The trainee is also asked about illness or injury from hazardous materials; if s/he was in medical surveillance and, if so, specifics of the program; if s/he had health and safety training in the prior 2 years; and if s/he is represented by a union.

This database is used to summarize training numbers, demographics and trainee origin, indicating possible training needs and whether outreach is effective.

To evaluate trainee performance, the Center administers a skills demonstration checklist for procedures in equipment handling and mock decontamination. Where relevant, these activities include special skills and procedures for the

presence of radioactive conditions. Evaluation of these activities is straightforward: trainees in relevant courses are not considered to have completed the course without successful and orderly demonstration of checklist items. Trainees may repeat a demonstration during the course of the assessment.

Because only 1% of trainees have less than a high school education, literacy has not become an issue at these DOE sites. Regardless, the training staff is experienced in identifying and addressing literacy problems and assistance for trainees' literacy needs is readily provided. Various effective training methods are utilized which allows for trainees to learn in their own manner; these methods include lecture, small group activities, and hands-on training. Students are offered the option of an oral exam if they cannot read or if they are not comfortable with the English language. Instructors are familiar with "The Right to Understand: Linking Literacy to Health and Safety Training" produced by the Labor Occupational Health Program at UC Berkeley and incorporate its principles within their courses. The Center's flexibility to respond to special needs will continue to be a priority of the Center as its member agencies seek to meet the needs of their target populations.

#### **4.8 Paper, Allied-Industrial, Chemical & Energy Workers International Union (PACE)**

Between September 1, 2001 and August 31, 2002, PACE provided training at six targeted DOE sites. This represents instruction to 5,870 students, for 37,170 contact hours in 441 classes. The six sites were Idaho National Environmental & Engineering Laboratories, Idaho Falls, Idaho; Mound Facility, Miamisburg, Ohio; K-25 Facility, Oak Ridge, Tennessee; Paducah Uranium Enrichment Facility, Paducah, Kentucky; Portsmouth Uranium Enrichment Facility, Piketon, Ohio; Hanford Site, Richland, Washington.

Other highlights during the year included:

- An annual technical meeting was held for worker-trainers
- A new workbook was produced for the annual 8-hour refresher course, piloted, revised, and distributed for use at all sites.
- Continued to work closely with site contractors to maintain an emphasis in their classes on a consistent contribution to the advancement of the Integrated Safety Management (ISM) initiative.
- At one site PACE worker-trainers were utilized to share lessons learned from site generated cooperative investigations of near misses and incidents in monthly safety meetings.

PACE uses site-specific Occupational Safety and Health Education Coordinators (OSHECs) to conduct training assessments and to follow up on the results. Their

interaction with site contractors provided a continuous working relationship that helped meet the needs of both workers and contractors. PACE Headquarters staff supports this interaction and gets involved in those situations that have "best practice" application potential across the industries.

Of special note is the PACE participation in a unique 2 year project to evaluate trainee performance and training effectiveness. Called the Solidarity Research and Evaluation Project (SREP), it has worked to ensure that its program assessment activities are carried out in a way that follows the principles of worker participation, empowerment, and organizational capacity building. PACE used the past year to continue the development of its Evaluation Team by promoting workers as trainers, workplace investigators, and program developers. Accordingly, not only has PACE made substantial progress in moving its program evaluation initiatives forward, it achieved this progress while expanding both the size and role of the Evaluation Team.

Participants from four DOE sites serve on the Team. At least one worker trainer representative from each site is involved in the current impact evaluation case study. Through its national team meetings, conference calls and fieldwork, the team works as a multidisciplinary group collectively developing research and evaluation skills and experience that integrates both "professional" and "local" knowledge and skills in all facets of the evaluation process. Worker trainer and staff team members participate in designing and piloting evaluation instruments such as surveys and interview guides, data collection, data analysis, and strategic planning for the dissemination of evaluation findings. The results of this two-year project will be forthcoming.

In the meantime, PACE has released an extensive Near-End of Course Evaluation Report. The evaluation instruments were administered near the end of the 8 hour Refresher Trainings, a tactic utilized to increase both the rate and the quality of the responses. The participants were asked about the overall usefulness of the training, the extent to which the purposes specified for the training were perceived as relevant and the extent to which they were achieved; whether the training raised new issues for participants; the extent to which the values of respect, empowerment, and working collectively that PACE espouses for its training were practiced in the training; and a number of questions about the concepts of systems of safety and their utilization. In brief, this evaluation showed very positive results: for example, over 84% expected to use the information at work; almost all participants found the training useful, with nearly 40% finding it very useful; and over 80% found that the training met its purposes. When asked if the training would help them recognize multiple root causes of accidents and incidents in their own workplaces, over 82% agreed. Throughout this evaluation, similar results were achieved, a strong indication of programmatic success.

Finally, in terms of ongoing curriculum development, PACE, to reinforce the prevention of accidents, incidents, and emergency responses, incorporated new "Systems of Safety" modules into their 8-hour refresher. The new modules were designed to challenge participants to advance their analytical skills. Advance skill application was also made a theme throughout the workbook. Participants were encouraged, through hands-on activities, to apply the prevention concepts embodied in the training modules. Consistent with past practice, actual incidents drawn from DOE Weekly Occurrence Summaries and the experiences of their worker trainers formed the basis of the training exercise.

## **5.0 WETP Small Business Innovative Research Initiative (SBIR)**

The NIEHS WETP has a number of other programs and initiatives that may impact upon the NIEHS/DOE effort covered by this report. One of these is the WETP Small Business Research initiative, which is part of the WETP Advanced Training Technology (ATT) program.

During FY 2001, funding for the NIEHS WETP Hazardous Waste Worker Training Program began to be directly appropriated to the NIEHS; therefore allowing the NIEHS to take a percentage of the funding to establish a Small Business Innovative Research (SBIR)/ Small Business Technology Transfer Research (STTR) initiative.

Based on its program experience, the WETP identified a need to create new products that would support high quality health and safety training for hazardous waste workers and emergency responders. On-line or "e-learning" technologies have the potential to provide such support in a manner that is economical and effective in terms of adult learning. Given the WETP core values for hands-on learning, instructor-to-learner, and learner-to-learner interactions, these new technologies needed to be developed with a careful understanding of the relationship between individual skill-based components and hands-on, instructor and worker-oriented training. Using the Small Business Innovative Research (SBIR)/ Small Business Technology Transfer Research (STTR) program, the WETP sought to assist in the development of technology driven commercial products that can support and be integrated into current training activities. The NIEHS thus issued an RFA entitled "Development of Innovative E-Learning Products for Worker Safety and Health Training In Hazardous Waste and Chemical Emergency Response" (RFA-ES-02-002).

The NIEHS encouraged applicants to this SBIR RFA to pursue partnerships and collaboration with awardees of the WETP program and to design new e-learning products that can extend the existing NIEHS curricula and training programs into the digital world. The WETP entertained well-justified Phase I applications for an SBIR/STTR award with a project period up to two years and a budget not to exceed a total cost of \$200,000 per year.

The Request for Applications (RFA-ES-02-002) was released on December 12, 2001 with a receipt date of April 17, 2002. The NIEHS received 19 letters of intent and 15 applications. Of these, eight were SBIR Phase 1, three were STTR Phase 1, and four were deemed non-responsive to the RFA. Dr. Sally Eckert-Tilotta, Scientific Review Branch, organized the technical merit review that was held June 24 in Research Triangle Park, NC. Concurrence with the review process by the National Advisory Environmental Health Sciences Council took place on September 10, 2002.

In September, 2002, the WETP made four Small Business Innovative Research (SBIR) Phase One awards totaling \$756,347 for the development of innovative "e-learning" products for worker safety and health training in hazardous waste and chemical emergency response. These awards will result in new products that will help provide high-quality health and safety training for hazardous waste workers and emergency responders. Effective and economical, these particular on-line or electronic learning technologies are aimed at specific training needs identified by the small business applicants in partnership with other WETP awardees. During 2003, the WETP hopes to issue a new RFA that will expand upon the lessons learned from the current awards and include a component that utilizes e-learning to assist skilled support personnel, such as crane operators, in preparing to address WMD events. A brief description of each current awardee and their project is provided below:

#### **FOF Communications (FOF)**

FOF is an informational design company with more than 20 years of experience in research, print, video, CD, and web-based programs for government, non-profit, labor, and corporate clients. Mr. Rod Wolford and Ms. Marilyn Larson have been the partners since the Washington, DC-based firm's founding in 1979. FOF products include the award-winning new employee orientation video for the U.S. Internal Revenue Service, the Medicare Fraud video for Booz Allen Hamilton, The Handbook of Skin Protection for The Aberdeen Group, and dozens of nationally used CDs, books, DVDs, and videos. In the research arena, the partners are recipients of the prestigious Kammer Merit in Authorship Award from the American College of Occupational Medicine.

The company's NIEHS SBIR project involves the development and evaluation of e-HazTools™ an interactive, commercially viable software product to teach or learn the fundamentals of practical chemistry for hazardous materials. E-HazTools,™ will hook into public chemical databases to drive e-outcomes in questioning-method scenarios and problem-solving exercises. FOF is partnering with the NPRFC. Consortium members will provide subject matter consultation and the Alice Hamilton Occupational Health Center, an NPRFC member, will provide field-test opportunities. The IBT and the Sheet Metal Occupational Health Institute also will provide expertise and field-test options.

"Instructional solutions for CD and the web require more than just text, graphics, animation, video, and audio components," says Rod. "It is the well-planned design, integration, and testing that create effective instructional products."

### **Advanced Technologies and Laboratories International, Inc. (ATL)**

ATL is a young, dynamic consulting company specializing in health and safety, environmental protection and information systems. Since 1995, ATL has built a solid reputation for technical excellence, attention to customer service, and value. Among ATL's customers are the Occupational Safety and Health Administration (OSHA), the Department of Energy (DOE), the Nuclear Regulatory Commission (NRC), the National Institute for Occupational Safety and Health (NIOSH), the National Center for Environmental Health, the Department of Housing and Urban Development, the Center to Protect Workers' Rights, the IUOE, and the United Mine Workers.

ATL is a woman-owned, 8(a) certified small business based in Germantown, Maryland, with field offices in Oak Ridge, Tennessee, Richland, Washington, and Albuquerque, New Mexico.

For its SBIR project, ATL is partnering with the IUOE National Hazmat Program (IUOENHP). The IUOENHP has distinguished itself as an outstanding provider of Hazwoper and related training, and a leader in adapting new training technologies. ATL and the IUOENHP have worked together successfully on other projects for over two years.

ATL's primary aim under the SBIR grant is to develop and test a Web-Based Training Center that integrates a set of web-based functions into a coherent technology-assisted learning tool. This unique product will enable training techniques such as virtual "small group activities" that draw upon the work experiences and skills of the training participants in collaborative, "team" settings. It will retain the focus on "peer" worker-trainers that is at the heart of most WETP-sponsored training.

### **Y-Stress Inc.**

Y-Stress is a small business located in Tobyhanna, Pennsylvania, in the heart of the Pocono Mountains. Their Training Technologies Division's goal is to make online learning both accessible and enjoyable. Y-Stress Inc.'s SBIR project, entitled "Scenario-Based Virtual Hazardous Awareness Training," entails working with the George Meany Center for Labor Studies - National Labor College (GMC - NLC) to turn their current Railway Workers Online Eight-Hour Awareness Course into a more interactive, virtual hands-on SCORM-compliant version. This will be done using the latest in technologies that will allow streaming of rich multimedia content over low bandwidth connections.

The goal is to increase online completion rates as well as retention by making the course more interactive and engaging so that as learning and mastery increase,

the safety and health of the workers also increase. GMC-NLC is providing their online course, related data, subject expertise, and pilot testing sites. Once it is concluded that these applied technologies increase learning, it will then be applied to other safety courses that will become part of a safety portal based on an open source philosophy. The new version of the Railway Workers Online Eight-Hour Awareness course and portal will be hosted on [www.safetywired.com](http://www.safetywired.com). Anyone interested in reviewing and giving feedback on the course during its development and implementation phases can e-mail [review@safetywired.com](mailto:review@safetywired.com).

### **New Leaf Interactive Media**

For the past seven years, New Leaf Interactive Media has specialized in creating interactive media content for education and business. Their primary goal in creating CD-ROMs, websites, and kiosks for businesses, museums, and faculty has been to combine excellence in design with transparent functionality. They recognize that, while users will endure a learning curve for application software, in presentation software the learning curve must be low to nil.

In partnership with Kirkwood Community College's HMTRI program, and its director, Doug Feil, New Leaf Interactive Media plans to create an immersive experience – using digital video, actors, and sets – that will place hazardous waste worker trainees at the scene of an accident, encouraging them to observe the various clues and formulate a plan of action. Each choice on the part of the trainee results in immediate feedback. A choice that results in negative consequences gives feedback about that consequence then returns the user to the menu screen to make a choice that works better. A series of correct choices leads the worker to finish the exercise in about twenty minutes, with video footage of procedures to reinforce correct methods. Incorrect choices might lead the user to spend over an hour with the training disc.

DVD-video is an inexpensive medium, requiring only a set-top player and remote control device. Since DVD-Video can also be played on personal computers, we plan to add some content in the ROM portion of the disc which will take the user to a website for testing. However, in respect of the digital divide in our culture, all testing materials will also be made available on paper, so that a personal computer is not required to use the lessons.

Over two years, New Leaf Interactive Media plans to produce a series of three DVD-video discs: "Mystery Drum" – a chemical spill and various possible outcomes; "Lock-out Tag-out in a Confined Space" – problems related to making a safe entrance through lock-out procedures; and "Brownfields Hazardous Assessment Exercise" – redeveloping a 4-block site containing contaminants. This plan will include extensive testing of the discs, prior to commercial release, with target groups. The discs are intended for use both in the classroom, as a teaching aid, and for individual use outside of class, including for certification training. In the course of the project, New Leaf Interactive Media will develop a new website related to the development, sale, and use of the grant products, and

will publicize the address. (This should be in place in the late summer/early fall of 2003.)

## **6.0 WETP Clearinghouse Update**

Through an ongoing contract with OD Systems Inc., the National Clearinghouse for Worker Safety and Health Training continued to act as a centralized distribution and information point through which members of the worker education and training community can access technical documents, safety and health update information, technical workshop reports, and curricula produced by the WETP awardees. The National Clearinghouse continued to operate as the information dissemination arm of the WETP, disseminating program information between and among the grantees, to other government agencies, and to the worker safety community.

Clearinghouse staff visited Ground Zero in New York shortly after the terrorist attack, to get a first hand assessment of the situation and of the WETP's evolving role in protecting those workers involved in the rescue and recovery effort. The WETP communication channels, such as the weekly Newsbrief and WETP web site, were dedicated during the months after September 11th to keeping worker safety professionals updated on conditions at Ground Zero and to keeping them abreast of new information provided by the CDC, NIOSH, OSHA, EPA and other organizations. A worker safety study was commissioned immediately after September 11th and was the first professional assessment of the safety and health issues associated with the WTC work site, one which gave a true and honest review of the dangers faced by workers and the minimal protections afforded to them.

The National Clearinghouse facilitated two workshops during the 2002 fiscal year. The NIEHS Strategic Planning Meeting was held on November 1-2, 2001 in Chapel Hill, North Carolina and was the culmination of a planning process begun in April, 2001; and the Learning From Disasters, WMD Preparedness Through Worker Training Workshop, which was held on April 25 - 26, 2002 in Nashville, Tennessee. The Learning From Disasters workshop was planned and developed by National Clearinghouse staff members. The final WETP Strategic Plan and the final report for the Learning From Disasters workshops are both currently available on the WETP web site.

The WETP weekly digital newsbrief underwent some dramatic changes during the year to increase the usability of the newsbrief and to provide subscribers the maximum number of worker safety-related stories appropriate for an online newsbrief format. Subscribers now have a password to their accounts and can modify their email address without having to contact National Clearinghouse staff. MDB also created administrative screens, which allow the automated distribution of the newsbrief to WETP readership. The subscribers now number

more than 300 and are continually increasing. The Newsbrief is also completely accessible from the webpage where it is utilized by thousands of readers.

The National Clearinghouse was also tasked to focus on the feasibility of building a National Registry of HAZMAT Trained Workers for federal disaster response and for providing an outline of how to create a pilot version of this registry. On August 15, 2002, a meeting was held at the NIEHS to discuss future safety and health training program initiatives regarding WMD incident response with a particular focus on what training is appropriate for skilled support personnel and the feasibility of establishing a national registry of trained personnel to respond to future terrorist actions. Bruce Lippy of the MDB staff is leading this effort. Participants included members from the WETP awardee community that had received supplemental funding to support their WMD-specific initiatives. The draft report is now available at [www.wept.org](http://www.wept.org). The Feasibility Study is scheduled for completion in fiscal year 2003.

## **7.0 World Trade Center (WTC) Response Update**

Since September 11, 2001, our nation has been forced to take a closer look at how all our agencies respond to federal disasters, how to protect the health and safety of the workers and volunteers who do respond to these emergencies, and how to better prepare our nation in the event of future disasters. For the NIEHS Worker Education and Training Program (WETP) and its cooperative agreement awardees, the aftermath of this disaster has presented an opportunity to provide environmental training resources and expertise on the front lines of the country's disaster response.

Subsequent to September 11<sup>th</sup>, supplemental awards were made by the NIEHS to support education and training activities related to the WTC cleanup, the anthrax contamination response, and the development of WMD training. Through its extramural awardees, NIEHS was able to quickly mobilize sustained resources to provide information, equipment and training resources to high-risk worker populations engaged in WMD response. Training courses and curricula developed by NIEHS awardees include classroom, hands-on and on-line health and safety training for workers, supervisors and professionals focused on hazardous waste operations and emergency response.

A site-specific worker training program developed by the NIEHS grantees, which includes a three-hour WTC site safety and health orientation and a train-the-trainer program, has been used by 55 unions, employers, and governmental representatives to train approximately 1,300 construction workers at Ground Zero, including most of the building and construction trade workers who have worked from mid-September through June, 2002. This NIEHS-sponsored training has been coordinated by the CPWR and the IUOE.

Also, the IAFF has worked vigorously over the past eight months to reestablish the hazardous materials management capability of the New York City Fire Department. FDNY response on 9/11 resulted in the loss of 343 fire personnel. Most of the Department's hazardous materials response personnel were among the victims, including the command structure. All of the Hazmat Specialists were lost. Over the past year, the IAFF has retrained almost the entire cadre of skilled hazmat technicians for FDNY with NIEHS support.

L-AGC, with the NIEHS support, has conducted anthrax remediation training for environmental laborers in New York City and New Jersey. The L-AGC is translating the anthrax worker course into Spanish and Polish, and is developing two new course modules on other WMD to begin the process of creating a comprehensive Chemical/Biological Agent Remediation Worker course. Short modules were immediately created to provide training for the L-AGC who were actively involved in the anthrax remediation at the U.S. Postal facilities in Washington, DC and New Jersey as well as the NBC building in NYC.

L-AGC also provided special Hazardous Waste/Anthrax response training to several law enforcement agencies using NIEHS support. In December 2001, L-AGC provided two 50-hour HW Operations/Anthrax Awareness courses to the DC Metropolitan Police SWAT teams. In January 2002, a similar course was provided to a group of U.S. Marshals who are tasked with protecting various judicial buildings/personnel throughout the United States. The U.S. Marshals have had approximately 150 more marshals take this specialized HW Worker course. Requests for training are also in process from the Capitol Police, the Park Police (US National Park Service), and the FBI.

As the work continues and recovery turns into rebuilding, more skilled support personnel have been needed to clean up the lower Manhattan area and the contaminated buildings adjacent to the WTC complex. From the operating engineers, who manned one of the first Hazmat mobile units on the WTC site and provided respiratory equipment and testing, to the IAFF, NY Carpenters, L-AGC Education and Training Fund, CPWR, and all of the other health and safety support at the WTC site, workers have received this critically needed training.

Based on its experience at the WTC site and in supporting anthrax remediation efforts, WETP is exploring a coordinated federal disaster response training program that focuses on health and safety and environmental course curricula which should include at a minimum emergency response protocols, hazard communication, personal protection equipment and respiratory protection. As a first step toward creating a trained cadre of WMD remediation workers, NIEHS has begun the development of training modules on various biological/chemical agents that can be incorporated into Hazardous Waste Refresher courses or can stand alone as part of a larger WMD training program. Chemical/biological agents that are being considered for inclusion in a training program include the

following: smallpox, botulism, plague, tularemia, mustard gas, phosgene, choking agents, and the nerve gas B sarin.

NIEHS has also begun a feasibility study to explore the development of a national registry of trained and pre-certified skilled construction support personnel in relevant crafts for immediate response to national disasters or possible catastrophic terrorist attacks under this special program. This capacity building activity will allow rapid contact and deployment of skilled support personnel anywhere in the country, wherever and whenever terrorists strike again.

The example of the NIEHS response to the 9/11 tragedies has provided a great opportunity for bringing scientific expertise and environmental health resources to bear on disaster situations that are fraught with potential environmental peril. Minimization of injuries and further loss of life through public health prevention is a critical tool to assure that our nation does not experience secondary disasters and other potential collateral damage.

## **8.0 WETP Supplemental Awards**

As part of the federal response to the September 11, 2001 terrorist attacks, the National Institute of Environmental Health Sciences (NIEHS) received \$6,000,000 to support World Trade Center (WTC) training response actions, including education and training of new Hazmat teams for the New York City Fire Department, training environmental remediation workers, health and safety training for site cleanup workers, training and certification in the use of personal protection equipment in the cleanup effort, and weapons of mass destruction training for the Hazmat workforce. After a review by representatives of relevant federal agencies, six supplemental awards were made on April 3, 2002 to current cooperative agreement recipients of the NIEHS Worker Education and Training Program (WETP). The purpose of these administrative supplements was to develop an integrated education and training approach that will address immediate and long-term worker health protection concerns arising from the September 11th terrorist attack on the World Trade Center (WTC). A summary of the supplemental funding is below.

### **International Association of Firefighters (IAFF) --- \$3,205,597**

The IAFF received support for direct delivery of hazardous materials technician and chemical protective clothing/decontamination training classes for the Fire Department of the City of New York (FDNY). Support was also requested to cover replacement personnel while critical FDNY staff members attend required OSHA HAZMAT training. The training proposal was designed to meet the needs of rebuilding the FDNY infrastructure with a good mix of classroom and hands-on training.

**International Union of Operating Engineers (IUOE) -- \$1,451,047**

The supplemental proposal from IUOE received support under four separate Response Activities. Support was provided as follows: 1) development of modules to prepare skilled support personnel for quick response at weapons of mass destruction sites and a registry of trained individuals; 2) evaluation of the appropriateness of the WTC awareness training and the development of guidance for the preparation of skilled construction support personnel at future mass destruction sites; 3) creation of a summary report concerning the distribution and fit testing of respiratory protection equipment at the WTC site and the development of a training module that covers the lessons learned from this process; and 4) development of two distinct training programs for mine safety inspectors and stationary engineers which focus on the use of weaponized microbials and other biochemical agents to assure appropriate emergency response and remediation actions.

**The National Puerto Rican Forum, Inc (NPRF) ---- \$480,000**

The NPRF and their consortium members at the Alice Hamilton Occupational Health Center, Office of Applied Innovations and the Maine Labor Group on Health received support for weapons of mass destruction training for the Hazmat workforce. The NPRF consortium provided direct instructor and worker training for hazmat workers in three principal target populations including the International Association of Heat and Frost Insulators & Asbestos Workers (AWI), the American Federation of Government Employees (AFGE) and emergency response personnel in Kentucky, Maine and Washington, DC. The training consisted of add-on training modules for emergency response (ER) awareness (some specific to biological contamination such as anthrax), the ER operations level, the hazardous waste worker initial and refresher training to include modules on preparing and responding to bio-terrorism related incidents such as anthrax contamination.

**University of Medicine & Dentistry of New Jersey (UMDNJ) --- \$398,711**

The UMDNJ consortium received support for training activities which included: support for NYCOSH (New York Committee for Occupational Safety and Health) to provide training for 200 Transit Union Workers in lower Manhattan with 24-hour hazardous materials technician training; support for the New York District Council of Carpenters Labor Technical College for training their members in health and safety training for WTC site cleanup; and support for the New Jersey State Police (NJSP) receive to train approximately 2,875 Hazmat workers in the police and hospital setting with knowledge and skills to effectively respond to emergency situations regarding weapons of mass destruction.

**Laborers-AGC Education and Training Fund (L-AGC) --- \$314,645**

The supplemental proposal from L-AGC received support for training workers currently employed on the WTC cleanup and the WTC subway reconstruction project and for training non-English speaking workers in New York City and New

Jersey who are involved in anthrax remediation sites. The proposal is an important initiative with a high priority target population.

**Center to Protect Workers Rights (CPWR)--- \$100,000**

It was recommended that the CPWR consortium receive support to continue the 3-hour health and safety training targeting workers at the World Trade Center. In addition, the CPWR focused on the following: developing a disaster response training; conducting a series of focus groups to assist in determining the content of a worker training program, and hosting a series of train-the-trainer programs to bring their network of over 3,500 OSHA-certified instructors “up to speed” in the delivery of the training. The training included the following topics: educate members about how best to support first responders in a disaster situation, e.g., command structure and communication channels of firefighters and emergency medical personnel; provide essential information about the types of hazards that could be confronted under various disaster scenarios, e.g., physical hazards, chemical hazards, biological hazards; and provide more targeted training on personal protective equipment, particularly respiratory protection, decontamination, etc.

**9.0 Conclusion**

The past year of the NIEHS/DOE program represents another highly successful effort in protecting workers employed throughout the DOE complex. It shows that cooperation between federal agencies, non-profit awardees, contractors, and the workers themselves can result in a program that has a positive effect on workplace health and safety.

The ability of the NIEHS/DOE awardees, as demonstrated in this report, to respond to DOE initiatives such as Integrated Safety Management; to provide flexible training services for the DOE and its contractors; and to recognize and adapt to the training needs of a changing workforce is the foundation upon which this success is based.

During the upcoming budget year (FY 2002), NIEHS WETP will continue to support these eight primary awardees. There will be \$8,201,000 (see Appendix 6) in education and training awards distributed. The result of this investment will be the continued emphasis on worker health and safety across the entire DOE complex.

The NIEHS WETP is proud to join the DOE in its commitment to excellence in safety and health preparedness and to the continuous improvement in developing effective worker training programs.

## 10.0 Appendices

### APPENDIX 1: TRAINING PARAMETERS

FINAL NINE YEAR SUMMARY: DOE/NIH/S WORKER EDUCATION AND TRAINING PROGRAM										
TRAINING PARAMETERS <sup>1</sup>	1994	1995	1996	1997	1998	1999	2000	2001	2002	TOTAL
Number of Awardees	8	8	8	7	7	7	7	8	8	
Courses Completed	476	1,086	1,193	1,270	979	922	1,150	1,379	1,954	8,455
Workers Trained	7,107	13,566	18,642	18,394	15,048	14,049	15,813	18,833	25,399	146,851
Contact Hours	184,604	249,704	290,939	244,212	217,666	202,997	217,039	245,436	302,640	2,155,237
Dollars Awarded	\$11,887,000	\$9,891,526	\$9,719,474	\$8,935,000	\$7,996,000	\$8,436,000	\$7,423,500	\$8,200,000	\$8,076,971	\$80,565,471
Cost Per Contact Hours	\$64.39	\$39.61	\$33.41	\$36.59	\$36.74	\$41.56	\$34.20	\$33.41	\$26.69	\$37.38

<sup>1</sup>Data based on program years of training, which begin on September 1, 1993 through August 31, 1994; and continues this pattern for the next years.

**APPENDIX 2: FY 2001 FUNDING**

<b>DOE/NIEHS WORKER EDUCATION AND TRAINING AWARDS FOR BUDGET PERIOD 09/01/2001-08/31/2002</b>	
<b>AWARDEE</b>	<b>DOE 9/2001 AWARD</b>
International Chemical Workers Union Council	\$114,464
International Association of Fire Fighters	\$617,625
Laborers-AGC Education and Training	\$2,822,760
Paper, Allied-Industrial, Chemical and Energy Worker International Union	\$1,102,936
University of Medicine & Dentistry of New Jersey	\$507,253
International Union of Operating Engineers	\$1,320,933
Center to Protect Workers' Rights	\$1,387,147
HMTRI Kirkwood Community College	\$203,853
<b>TOTAL</b>	<b>\$8,076,971</b>

**APPENDIX 3: TOTAL TRAINING BY NIEHS AWARDEE**

<b>EPA/NIEHS WORKER EDUCATION AND TRAINING TOTAL TRAINING FOR BUDGET PERIOD 09/01/2001-08/31/2002</b>			
<b>AWARDEE</b>	<b>COURSES COMPLETED</b>	<b>WORKERS TRAINED</b>	<b>CONTACT HOURS</b>
Center to Protect Workers' Rights	411	6,054	60,010
HMTRI Kirkwood Community College	100	954	16,164
International Association of Fire Fighters	30	705	13,416
International Chemical Workers Union Council	192	2,297	20,647
International Union of Operating Engineers	104	2,345	24,872
Laborers-AGC Education and Training	576	6,372	121,733
University of Medicine & Dentistry of New Jersey	100	802	8,628
Paper, Allied-Industrial, Chemical and Energy Worker International Union	441	5,870	37,170
<b>TOTAL</b>	<b>1,954</b>	<b>25,399</b>	<b>302,640</b>

**APPENDIX 4: TARGET POPULATIONS**

DOE/NIEHS TARGET POPULATIONS 09/01/2001 – 08/31/2002						
TARGET POPULATIONS	COURSES COMPLETED	% COURSES COMPLETED	# WORKERS TRAINED	% WORKERS TRAINED	# CONTACT HOURS	% CONTACT HOURS
CERCLA Cleanup <sup>1</sup>	689	35%	11,373	45%	160,180	53%
RCRA/Industrial	112	6%	1,322	5%	15,296	5%
Emergency Response	35	2%	609	2%	10,560	3%
Radiation	66	3%	518	2%	12,570	4%
Lead Abatement	15	1%	240	1%	2,258	1%
Asbestos Abatement	197	10%	2,498	10%	46,906	15%
Hazardous Material	7	0%	133	1%	1,369	0%
Other	833	43%	8,706	34%	53,501	18%
<b>TOTALS</b>	<b>1,954</b>	<b>100%</b>	<b>25,399</b>	<b>100%</b>	<b>302,640</b>	<b>100%</b>

<sup>1</sup> The overall majority of training remains in the CERCLA Cleanup training.

**APPENDIX 5: PERCENT AND TOTAL OF NIEHS COURSES COMPLETED,  
WORKERS TRAINED, AND CONTACT HOURS, BY SITE**

**DOE/NIEHS WORKER EDUCATION AND TRAINING PROGRAM PERCENT AND  
TOTAL OF NIEHS COURSES COMPLETED, WORKERS TRAINED, AND  
CONTACT HOURS,  
BY SITE FOR BUDGET PERIOD 09/01/2001-08/31/2002**

SITE	COURSES COMPLETED		WORKERS TRAINED		CONTACT HOURS	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Argonne National Laboratory	13	1%	326	1%	7,768	3%
Brookhaven National Laboratory	27	1%	359	1%	4,140	1%
Fernald Integrated Demonstration Site	10	1%	62	0%	283	0%
Grand Junction	2	0%	21	0%	680	0%
Hanford	636	33%	8,505	33%	70,364	23%
Idaho National Engineering Laboratory	105	5%	1,473	6%	16,812	6%
Kansas City Plant	4	0%	86	0%	736	0%
Lawrence Livermore National Laboratory	3	0%	40	0%	872	0%
Los Alamos National Laboratory	53	3%	840	3%	7,914	3%
Mound Plant	14	1%	195	1%	2,720	1%
Nevada Test Site	53	3%	728	3%	15,006	5%
Oak Ridge Field Office	372	19%	4,823	19%	71,621	24%
Paducah Gaseous Diffusion Plant	45	2%	635	3%	9,998	3%
Pantex Plant	45	2%	723	3%	13,322	4%
Portsmouth Gaseous Diffusion Plant	290	15%	3,066	12%	6,822	2%
Princeton Plasma Physics Laboratory	19	1%	44	0%	864	0%
Rocky Flats Office	44	2%	385	2%	14,784	5%
Savannah River Site	64	3%	740	3%	14,844	5%
Santa Susanna Field Laboratory	1	0%	15	0%	600	0%
Sandia Albuquerque	5	0%	191	1%	4,104	1%
Stanford Linear Accelerator Center	1	0%	12	0%	480	0%
Umtra Project Office	6	0%	96	0%	3,200	1%
West Valley Demonstration Project	62	3%	514	2%	5,536	2%
Amchitka Island Test	4	0%	46	0%	276	0%
Ashtabula	2	0%	33	0%	840	0%
St. Louis Airport Site	12	1%	256	1%	4,962	2%
Other1	62	3%	1,185	5%	23,092	8%
<b>TOTAL</b>	<b>1,954</b>	<b>100%</b>	<b>25,399</b>	<b>100%</b>	<b>302,640</b>	<b>100%</b>

<sup>1</sup> Includes: Department of Energy – Headquarters and others

**APPENDIX 6: FY 2002 FUNDING**

<b>DOE/NIEHS WORKER EDUCATION AND TRAINING AWARDS FOR BUDGET PERIOD 09/01/2002-08/31/2003</b>	
<b>AWARDEE</b>	<b>DOE 9/2002 AWARD</b>
International Chemical Workers Union Council	\$466,941
International Association of Fire Fighters	\$661,568
Laborers-AGC Education and Training	\$2,692,089
Paper, Allied-Industrial, Chemical and Energy Worker International Union	\$1,136,022
University of Medicine & Dentistry of New Jersey	\$522,470
International Union of Operating Engineers	\$1,083,662
Center to Protect Workers' Rights	\$1,427,975
HMTRI Kirkwood Community College	\$210,273
<b>TOTAL</b>	<b>\$8,201,000</b>