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NIEHS/DOE Hazmat Worker Training Program
FY 2001 Accomplishments and Highlights:

Submitted by the
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1 Introduction

In an effort to enhance training to the Department of Energy (DOE) employees involved in the hazardous waste cleanup, the Worker Education and Training Program (WETP) has provided site-specific and quality training to workers in a timely and cost-effective manner across the DOE nuclear weapons complex. Of the tens of thousands of workers who are engaged in hazardous waste work, training needs range from basic hazardous waste operations and emergency response (HAZWOPER) courses to asbestos and lead abatement, confined space, hazard communication, respirator, radiation, and general industry safety courses.

The National Defense Authorization Act for fiscal years 1992 and 1993 (42 USC 7274(d)) authorized the Secretary of Energy in section 3131(a)(1)(A)-(B) to make awards: "to provide training and education to persons who are or may be engaged in hazardous substance response or emergency response at DOE nuclear weapons facilities; and to develop response curricula for such training and education." Through Interagency Agreement (IAG) with the DOE, NIEHS administers this training grant assistance program through awarding cooperative agreements.

2 2000-2001 Program Highlights: Progress to Date

2.1 Summary of Training

In completing the eighth year of the NIEHS/DOE Worker Education and Training Program (September 1, 1993 to August 31, 2001), the NIEHS has successfully supported eight primary awardees (see Appendix 1). Across the DOE complex, the NIEHS awardees have trained over 121,000 workers and presented over 8,000 classroom and hands-on training courses, accounting for 1.8 million contact hours of actual training at an average cost of $39.00 per contact hour (see Appendix 2).

Through an Interagency Agreement, NIEHS received $8.5 million from the FY 2000 DOE appropriations, which provided funding to NIEHS awardees during the past year (September 1, 2000 – August 31, 2001). Of the FY 2000 funds, $8.2 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 3).

Between September 1, 2000 to August 31, 2001, the eight primary worker training awardees and more than thirty sub-awardees delivered 1,379 courses, reaching 18,833 workers, which account for 245,436 contact hours of health and safety training at an

average cost of $33.41 per contact hour (see Appendixes 2 and 4). This training ranged from 4-hour refresher programs through more complex train-the-trainer courses lasting up to 120 hours. Fifty-four percent of the training has been focused on delivering basic HAZWOPER cleanup worker training. This comprises 10,623 workers who received 80-hour training, basic 40-hour training, or 4-8 hour refresher courses (see Appendix 5).

While the DOE/NIEHS awardees have provided training at more than 30 DOE sites during the past year, over half of the training provided was at two of the largest DOE sites, Hanford and Oak Ridge. Between the two sites, 798 (58%) courses were delivered, reaching 11,118 (59%) workers, which account for 128,020 (53%) contact hours of training (see Appendix 6).

2.2 Continuation of the Peer-Reviewed DOE Worker Training Awards for FY 2001

After completion of the second 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, 2000. 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, 2000 for each of the programs supported with DOE Environmental Management resources. These awards ran through August 31, 2001.

Highlights of the training activities carried out by the NIEHS/DOE Worker Training awardees include:

2.2.1 Laborers- Associated General Contractors Education and Training Fund (Laborers-AGC)

The DOE Environmental Worker Training and Education Program (EWTEP), the Laborers-AGC and the International Brotherhood of Teamsters (IBT) conducted 459 courses for 4,886 workers. This accounts for 82,684 contact hours of training. A breakout of training by Laborers-AGC and the IBT is provided below.

Under the DOE EWTEP (excluding non-reimbursed courses), Laborers-AGC conducted 309 course presentations with 2,685 participants successfully completing their courses. A total of 153.3 weeks (60,956 training hours) were provided under the program. This total is 19.3 weeks more than the 134 weeks of training that was projected (112% of the goal).

The DOE worker training courses were conducted by Laborers-AGC at seven regional and two mobile training centers.

1. Augusta, GA (Savannah River)
2. Brighton, CO (Rocky Flats)
3. Edgewood, NM (Los Alamos)

4. Idaho Falls, ID (Idaho National Environmental and Engineering Laboratory)
5. Las Vegas, NV (Nevada Test Site)
6. Oak Ridge, TN (Oak Ridge)
7. Pasco, WA (Hanford)
8. Iowa Mobile Unit (assistance at Oak Ridge)
9. West Virginia Mobile Unit (DOE Headquarters)

Training increased at Idaho Falls (Idaho National Engineering and Environmental Laboratory (INEEL)), and Albuquerque (Los Alamos). The INEEL site is now fully functional and training numbers are expected to continue to increase during the upcoming year. Discussions with DOE and the prime environmental remediation contractor at Los Alamos (Johnson Controls) confirmed the need for additional training, especially for Confined Space training.

At Hanford, the demand for trained laborers decreased. This DOE facility does not anticipate a large demand for newly trained workers at present, therefore training numbers and projections are down.

At Brighton, continued staff vacancies limited the amount of training that can be accomplished. Laborers-AGC was able to provide instructor support through other sites or by using master trainers. There was an increase in demand for DOE training from Rocky Flats and Laborers-AGC continued to help meet this need by providing special assistance.

Training at both the Savannah River and Oak Ridge facilities continued to be strong. The anticipated decontamination and decommissioning of another main building at Oak Ridge increased the demand for training at that facility. These jobs require a wide variety of skills and safety training which the Laborers-AGC is able to provide through the grant program. Other courses, if able to be conducted by their staff, are provided at no cost to the program.

Finally, training for DOE Headquarters increased. Laborers-AGC expects to see a much greater need for training at this locality because of recent terrorist events in the Washington, DC area.

Since April 1999, Laborers-AGC utilized a computer scanable Hazardous Waste Refresher Application that helps track who has taken the course, where and what type of work they have done over the past year, and how they have used their hazardous waste worker/refresher training. The latter portion helps demonstrate the effectiveness of the Laborers-AGC DOE EWTEP. Answers to questions about the type of skills used on DOE sites/hazardous waste jobs, problems encountered on jobs, and how the worker responded to them are selected from options provided on the form so that they can be analyzed quantitatively. Open-ended questions about needed skills, the value of the training received, safety incidents on the job, and applying training and knowledge to work and home situations also provide valuable information about the usefulness of

the training and give specific examples of how training has benefited the worker, employer, and community.

Information from the refresher applications was scanned and entered into a refresher database. Open-ended questions were compiled and analyzed separately. The most frequent comments were noted and, if possible, tabulated.

2.2.2 University of Medicine and Dentistry of New Jersey (UMDNJ)

The New Jersey/New York Hazardous Materials Worker Training Center, provided 80 courses for a total of 804 workers trained, corresponding to over 7,850 contact hours of training. Center members involved in this program are the University of Medicine and Dentistry of New Jersey (UMDNJ) and the State University of New York at Buffalo. The UMDNJ School of Public Health provides training, as requested, to Brookhaven National Laboratory and Princeton Plasma Physics Laboratory employees. The University at Buffalo provided training to employees at West Valley Nuclear Services. Each institution provides flexibility in their training programs to accommodate additional training needs that arise each year.

Eighty percent of the number of trainees projected were trained, and over 76% of the contact hours projected were achieved. Changes in training needs from DOE sites were anticipated to the best of the Center's ability, however, not all training objectives were fully achieved, while others were exceeded.

UMDNJ trained 276 workers for 2890 contact hours. At Brookhaven National Laboratory, personnel from the industrial hygiene, environmental remediation, reactor, waste management and other departments were trained. UMDNJ provided the following courses: three 40-hour courses for a total of 20 workers trained; two 8-hour Supervisor courses for a total of 26 workers trained; nine 8-hour Annual Refresher courses for a total of 111 workers trained; two 8-hour Emergency Response Operations Refreshers for a total of 31 workers trained; one 2-hour Asbestos Awareness for a total of 9 workers trained; and one Operations and Maintenance Refresher for a total of 14 workers trained.

At Princeton Plasma Physics Laboratory, UMDNJ trained personnel from the environmental remediation, emergency services, and industrial hygiene divisions. Over the past year, three employees participated in the 40-hour course, one in the 8-hour Supervisor course, 27 in the 8-hour Annual Refresher, and four in the Asbestos Contractor/Supervisor Refresher. These courses were all provided at UMDNJ in New Brunswick. Additionally, UMDNJ provided three 8-hour Technician Refresher and three 8-hour Confined Space Refresher courses, with a total of 18 trained in each course, at PPPL.

The University at Buffalo Toxicology Research Center was responsible for training workers at West Valley Nuclear Services. They have trained 499 workers for approximately 4800 contact hours, all conducted at the West Valley Demonstration

Project facility. They conducted three 24-hour Hazardous Waste Worker Courses for 15 personnel. Also conducted were 32 8-hour Hazardous Waste Worker Refresher courses for a total of 406 persons from the facility. They also conducted three Emergency Response Operations Level courses for six personnel and designed, developed and conducted nine 16 hour "Bridge" Courses for 72 site personnel to upgrade their 24 hour HAZWOPER status to 40 hours. This was in preparation for the shift to Decontamination and Decommissioning (D&D) operations.

2.2.3 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 the DOE environmental restoration and waste management sites. Current CCCHST-DOE members are located at : Aiken Technical College at the Savannah River Site, SC; Amarillo Community College at the Pantex Plant, TX; Eastern Idaho Technical College and the Plumbers and Pipefitters Local 648 at INEEL, ID; University of Tennessee, Knoxville at the Oak Ridge National Lab, Y-12 and K-25 Plants, TN as well as Paduca, KY, and Portsmouth, OH.

CCCHST-DOE delivered 532 course hours to 351 students for a total 3,169 contact hours of instruction. The 11 web-based courses were delivered by the University of Tennessee (UT). An instructor proctors the final online exam.

In addition to Hazwoper-on-the-Web, HMTRI converted the Waste Site Worker Refresher for web-based delivery. It was completed August 30, 2001 and was made available to consortium members at no cost.

2.2.4 International Chemical Workers Union Council (ICWUC)

The ICWUC Center for Worker Health & Safety Education, in consortium with the International Association of Machinists and Aerospace Workers (IAM) continued to deliver training during this period 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.

The total number of persons trained at all DOE sites was 1,723 persons at 110 sessions (17,690 person hours). This included the six weeks that the Center devoted to developing the DOE trainers in Cincinnati, assisting with hands-on and on site training.

The basic program delivered at each site was the annual refresher mandated for CERCLA, RCRA and emergency responders. All sites revised their programs to incorporate each site's Integrated Safety Management Program.

2.2.5 International Union of Operating Engineers (IUOE)

Personnel currently being trained by the Operating Engineers National HAZMAT Program (OENHP) include employees of Y-12 National Security Complex, Oak Ridge National Laboratory (ORNL); East Tennessee Technology Park (ETTP, Formerly K-25) of Oak Ridge, Tennessee; Idaho National Engineering and Environmental Laboratory (INEEL); and Hanford, Washington. (Managing contractors of the sites, including BWXT (Y-12), UT-Batelle (ORNL), Bechtel Jacobs (ETTP), Bechtel BWXT Idaho (INEEL), Batelle, Bechtel National and Flour-Hanford (Hanford), regularly send personnel through OENHP training classes.) The OENHP also trains students representing hundreds of subcontractors, including BNFL, the largest decontamination and decommissioning contractor in the world.

OENHP plays a key role in supporting and promoting safe work practices by the DOE workforce through an extensive training program and consultation services. The far-reaching training program is developed, conducted, and sustained by the OENHP's diverse group of health and safety professionals and certified instructors prepared by the organizations train-the-trainer program. The worker-peer training method employed by the organization has proven to be a cost effective and successful approach. The OENHP has also been beneficial in easing the difficulty of the transition at may DOE sites from a Management and Operating (M&O) Contractor System to the current Management and Integration (M&I) approach. The changing work mission and workforce provide opportunities for the OENHP to continue to help insure that the emphasis on Integrated Safety Management System (ISMS) ideals are met through education of workers.

An important study[1] of one company's incident trends during 6.5 years of hazardous waste cleanup work showed that over 75 percent of the 1,848 injury/illness incidents recorded during that period resulted from mechanical agents and only 10 percent occurred because of chemical exposure. The study found that the highest rate was among laborers, followed by supervisors, and then heavy machinery operators. This last group is the target population for the training produced by the OENHP. This study buttresses the OENHP focus on construction safety issues in their training programs, rather than the inordinate emphasis on chemicals, which has been a common theme in many HAZWOPER training programs.

This year, the course curricula for the initial Train-the-Trainer program included HAZWOPER, OSHA 500, and OSHA 501, and the course length was reduced from 120 to 117 hours. This Train-the-Trainer was a pilot program incorporating the concept of reducing the redundancy of safety and health training. Training requirements within the three Train-the-Trainers provided by the OENHP, (HAZWOPER, OSHA 500, and OSHA 501) all cover Hazardous Materials, Hazard Communication, Respiratory Protection, and Health and Safety Plans. By consolidating these redundant topics and time

[1] Akbar-Khanzadeh, F. & Rejent, G. M. (1999). "Incident trends for a hazardous waste cleanup company." American Industrial Hygiene J. 60:666-672.

requirements in each course, potential instructors received more in-depth instruction on these topics. This course format also provided to the student an awareness of the integration of these topics within both OSHA regulations. Past OENHP Train-the-Trainer courses were 88 hours of HAZWOPER instruction, with an additional 32 hours of either OSHA 500 or 501 instruction.

2.2.6 Center to Protect Workers' Rights (CPWR)

The Center to Protect Workers Rights (CPWR) and its Construction Consortium for Hazardous Waste Worker Training were 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 & Pipefitters, Carpenters, Sheet Metal Workers, Electrical Workers, Ironworkers, and Roofers.

In 374 classes, 5,193 workers were trained. CPWR's training consortium achieved an overall completion rate of 96% of projected training for this grant year, and accomplished 57,262 contact hours of training.

CPWR provided training for mixed union courses as well as for specific unions. CPWR also conducted training for workers, technicians and management at the HAMMER training facility in Richland, Washington. In addition, CPWR administered sub-contracts with several unions that provided training directly to their members and other workers, technicians and management.

The Lead Worker training was completed, as well as a Confined Space course. One of the two asbestos worker courses was completed, as well as an MSDS course in place of the 4-hr Hazard Awareness training that was projected. An 89% completion rate was achieved for the 8-hr Respiratory Protection course; an 88% completion rate was reported for the Respiratory Protection Refresher. There were 32 OSHA 10 training courses completed

Through a needs-assessment conducted at CPWR's last Instructor Development course in Tacoma, Washington, it was determined that the peer trainers involved in delivering the hazardous waste training throughout the consortium wanted to receive more academic-level instruction in the areas of their training. CPWR determined that an OSHA 521 Industrial Hygiene course would satisfy the objectives of the trainers, and two were conducted. These courses provided in-depth analysis of many areas of concern for the trainers, who for the most part are not university-trained, but are construction workers. The course covered air monitoring theory and practice, noise measurements and effects, ventilation effectiveness, heat stress, and asbestos fiber counting, among other issues. The courses, which were conducted in collaboration with CPWR's OSHA National Resource Center, satisfied requirements for refresher certifications for the consortium instructors teaching lead and asbestos courses.

2.2.7 Paper, Allied-Industrial, Chemical and Energy Worker International Union (PACE):

PACE continued to provide HAZWOPER required training at the seven DOE sites where they have members: 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; Brookhaven National Laboratory, Upton, New York. PACE held its annual technical meeting for their worker-trainers, and continued progress on the Self-sufficiency Research Evaluation Project (SREP). Working with the Labor Institute, PACE produced a new workbook for the annual 8-hour Refresher course. PACE continued to work closely with site contractors to maintain emphasis on training to advance the Integrated Safety Management (ISM) initiative. PACE also participated in multi-grantee initiatives in SREP, worker curriculum writing, and Advance Training Technologies (ATT).

All of those trained by PACE under the current training grant were employees at a DOE site. PACE distributed attendance forms in each of the classes to allow for identification of job classification, previous safety and health training, and demographic characteristics of each trainee. The information on this form enabled PACE to compare the perceived training needs as described by union officers and staff with the actual needs as reported by the trainees. The PACE data collection system made it possible for them to track the trainees as to their continuation of employment and relevant job assignments regarding 1910.120 requirements.

PACE conducted 164 classes for 3,001 students for a total of 33,352 contact hours. In addition, 12 new Occupational Safety and Health coordinators were trained.

PACE International Union will continue to work with the site contractors at the seven DOE nuclear weapons sites where they have bargaining unit members and established worker trainers. PACE will continue to provide all required 1910.120 training required at these sites.

2.2.8 International Association of Fire Fighters (IAFF)

Of those DOE sites with the poorest training for emergency responders, five were chosen for IAFF training (Hanford, Savannah River, Oak Ridge, Rocky Flats and Lawrence Livermore). The IAFF expanded the number of targeted sites from five to ten. Targeted sites include the aforementioned, plus Nevada Test Site, Argonne National Labs, West Valley, Yucca Mountain, and Sandia National Laboratories.

IAFF hazardous materials training was divided into two categories: (1) Direct delivery to specific fire departments and (2) Instructor Training for fire service trainers from many different fire departments.

Instructor Training (47%) was the primary course delivered, followed by Direct Training for First Responder Operations (35%), and Confined Space Operations (17%). Nine Instructor Training courses were provided.

The increase in Instructor Training further developed the capability of individual DOE sites to provide their own hazardous material training. It is estimated that 125 students who received Instructor Training will train approximately 50 students per instructor per year. It is estimated that annually, 6,250 students will be instructed in First Responder Operations, based on the Instructor Training provided by the IAFF this year.

A total of 364 students were trained for a total of 8,608 contact hours.

3 DOE/NIEHS ISM Training Initiatives.

The Department of Energy, in DOE P 450.5, has committed itself and its contractors to technically sound, safe, and cost-effective operations supported by solid management systems that ensure protection of the public, the worker, and the environment. To accomplish this DOE places a high value on the Department's line managers and contractors working together to identify and resolve environmental safety and health concerns. As the Department has indicated in its Safety Management System Policy, DOE P 450.4, "Direct involvement of workers during the development and implementation of safety management systems is essential for their success."Worker participation is absolutely critical to achieving this goal, but it is the most difficult element of integrated safety management to achieve. NIEHS awardees are working to contribute to this process.

4 IAFF Integrated Safety Management (ISM)

IAFF training programs forcefully emphasize a systematic approach to risk reduction and injury prevention. As a result, a plan was implemented to update and revise all course objectives relating to personal safety. Students were challenged to work in a team-based learning environment that asked them to formulate safe response strategies based on hazard analysis and control. Through the use of active questioning and embedded testing techniques, course instructors ensured active, student-centered learning. The long-term goal of the IAFF ISM plan is to change the emergency responder's attitude toward protecting personal health and safety. The IAFF's plan to systematically integrate the principles of ISM is based on the following elements:

- Incorporating ISM principles in all IAFF training curricula
- Work with DOE training and safety managers at the aforementioned ten sites so that IAFF courses may be customized, scheduled and delivered in a manner that complements the target site's efforts to effectuate its own ISM plan
- Utilizing IAFF web-based resources to educate our instructor staff and to distribute up-to-date case studies reflecting ISM principles
- Incorporating and delivering custom courses that foster ISM development efforts throughout the DOE complex

- Incorporating specific ISM factors into the existing IAFF evaluation plan and tracking institutional changes as they relate to the DOE Nuclear Weapons Complex, in particular, and the fire service as a whole.

5 IUOE Integrated Safety Management Training

Integrated Safety Management (ISM) is a new model for the DOE that is causing significant positive changes across the complex. The OENHP was awarded supplemental funds to develop a training program to help workers on the complex participate in hazard assessments.

As stipulated in the initial proposal, the OENHP developed a draft questionnaire, in conjunction with its subcontractor PrSM, and pre-tested it with a focus group of DOE workers. After incorporating suggested changes, a cover letter from the OENHP Center Director, the double-sided survey, and a stamped, addressed return envelope were mailed to the 500 representatives of the sampling frame. The participants were also given a web address where they could complete their survey “on-line” if desired. Additional mailings were made to increase participation.

Two-hundred nineteen of the 500 surveys, or 44 percent, were completed and returned within one month of the mailing date, including:

- 77 returned out of 202 from Oak Ridge for 38 percent,
- 69 returned out of 160 from Hanford for 43 percent,
- 70 returned out of 138 from INEEL for 51 percent, and
- 3 returned without a site listed

Ninety percent of the respondents reported that they worked as a subcontractor for DOE while 10 percent stated that they worked directly for DOE. The majority of the respondents, 70 percent, reported that they had worked for DOE for more than 10 years as either a subcontractor or a direct hire. Less than half of the respondents reported that they belonged to a union. Of the returned surveys, 42 percent described their job classification as Craft/Line Workers, 11 percent as Managers, 9 percent as First-line Supervisors, 22 percent as Engineers, and 12 percent as Safety and Health Professionals. Seven percent of respondents did not specify their job classification. The median age, as well as the average age, of the respondents was 46 years. The majority of respondents, or 190, were male, 28 were female. When asked if they had ever had an accident or injury while working on a DOE site, 70 percent reported “No” and 30 percent reported, “Yes.”

The majority of respondents stated that they were familiar with ISM and reported that they were trained in ISM principles. Overall, 96 percent of the respondents stated that they were familiar with the ISM system, 90 percent reported that ISM was being used at their workplace, and 90 percent stated that they had been trained in ISM. Overall, 79 percent stated they had received training in conducting hazard assessments, but only 57 percent reported ever participating on a team conducting hazard assessments. For

the respondents who had received hazard assessment training, Job Hazard Analysis was, by far, the most common hazard assessment approach taught. Overall, 45 percent reported they would benefit from more training in ISM and 57 percent said they would benefit from more training in hazard assessment.

Using the results of this survey, the OENHP designed a comprehensive ISM training program that includes a PowerPoint presentation and several hands-on activities. OENHP instructors are provided with an ISM package that includes all of the above.

6 WETP Small Business Innovative Research Request for Applications (SBIR)

On December 12, 2001, the Worker Education and Training Program announced the release of the Worker Education and Training Program Small Business Innovative Research Proposal entitled “Development of Innovative E-Learning Products for Worker Safety and Training in Hazardous Waste and Chemical Emergency Response.”

The WETP Advanced Training Technologies (ATT) initiative has launched new territory regarding the use of technology and products to support these technologies for online learning. NIEHS intends to build on its program experience in environmental safety and health training by stimulating creative SBIR proposals to create products that will support high quality health and safety training for hazardous waste workers and emergency responders. To further enhance our ability to move toward commercialization of on-line learning technologies relevant to model safety and health training for hazardous waste workers and emergency responders, this initiative focuses on the development of technology driven commercial products using the Small Business Innovative Research (SBIR)/Small Business Technology Transfer Research (STTR) program. This RFA provides a flexible system within the SBIR program to cover the extensive needs and complex development processes needed to develop products to support and integrate technology-supported training for workers at Superfund sites.

The NIEHS WETP, in considering the development and application of Advanced Training Technology (ATT) to worker safety and health training, has realized that there is a substantial challenge in translating this new technology to our awardee organizations. This challenge is associated with the fact that each of the WETP awardee organizations is different with regard to its training target audience, the computer literacy and access to such technology among its target audience, the work its training target population performs, and training delivery methods and means, among other factors. In many ways, these challenges reflect the current reality of delivering job-related training content to any adult population in the United States. The "digital divide" in its various manifestations is a reality for anyone who attempts to use ATT approaches to effectively reach target populations with low levels of computer experience and knowledge. This concern for hazardous waste workers and chemical emergency responders has been particularly acute for a high-risk target population, which is characterized by ethnic and cultural diversity, low levels of formal education, and minimal prior computer fluency.

The following four areas describe the type of electronic learning products that will be supported under this SBIR RFA. Examples include but are not limited to:

1) Products to support electronic collaboration in safety and health training: "E-collaboration in safety and health training" involves enabling collaborative development of course materials by personnel widely separated geographically within the same organization and between collaborators working for different organizations. In addition to traditional face-to-face meetings and phone calls, a number of electronic tools and online approaches can be used to facilitate distributed teams in their creating or updating of instructional products. These capabilities include e-mail, mail list groups, bulletin boards, chat rooms, threaded discussion groups, FTP, and Web-enabled database-oriented development tools.

2) Products to support electronic certification in safety and health training: "E-certification in safety and health training" involves preparing and maintaining instructor competence as a critical issue in creating and maintaining the quality of health and safety training delivery and assuring adequate worker protection. This ATT option entails the use of online resources to improve instructor competence. The role of the instructor is highly valued in the WETP. Many grantee programs have systematic approaches to train, certify, and maintain instructor competence in both the content matter and in teaching skills.

3) Products to support electronic teaching in safety and health training: "E-teaching in safety and health training" encompasses live or virtual classroom training as a significant part of effective safety and health training delivery. A key WETP core value relative to ATT is to preserve the role of the trainer/instructor in classroom-like environments in the modeling, teaching, and verification of skills and knowledge. This ATT option for safety and health training delivery looks directly at ways technology can be used appropriately in live instructor-led, face-to-face, and virtual classrooms.

4) Products to support electronic learning in safety and health training: "E-learning in safety and health training" involves technology deployment to provide individualized or small group-based training in learning centers, in a technology-enabled "smart classroom," or to learner's desktop is a core part of the technology-supported learning process. As an ATT option, electronic learning is used to enable individualized learning at the learners' convenience and own pace prior to, as part of, after, or in place of classroom training. Electronic learning capability is now available to learners at their workplace (desktop, shared computer/kiosk, or learning center) and optionally at home or at the union hall. While multimedia computers connected to the Internet are much more widely available each year, care must be taken to ensure that a targeted set of learners will in fact have the needed access to work stations or learning centers.

Projects may be presented for SBIR/STTR support at all stages of learning technology development. Projects will be evaluated on overall innovation and success potential. Future support will be contingent upon NIEHS programmatic evaluation to ensure that

the investigators are accomplishing milestones and time lines presented in the original application.

7 WETP Advanced Training Technology (ATT) Initiative Highlights

Each awardee has developed some type of ATT approach to their training plan. As examples, here are highlights of ATT initiatives from two awardees.

Hazardous Materials Training Research Institute (HMTRI)

HMTRI refined its Hazwoper-on-the-Web for Internet delivery. One- hundred and sixty-nine workers enrolled. Approximately 133 students successfully completed the course. Hazwoper-on-the-Web provided 24 hours of computer based instruction supplemented with 16 hours of hands-on and classroom instruction. Twenty-four CCCHST member institutions utilized the program. Spanish language audio and text were added to the course this year. A new waste site worker refresher course is set for completion. The new refresher will consist of a minimum of six hours of computer-aided instruction supplemented with two hours of hands-on/classroom instruction. Spanish language audio and text will be added to this course also.

Laborers-AGC Computer Assisted Training and Distance Learning

The LaborersLEARN web portal had developed a user library and links to relevant web sites that contain information on worker health and safety and environmental remediation issues. However, L-AGC felt that there was a need to dynamically inform users of important developments within LaborersLEARN and within the environmental remediation/construction craft industry (e.g., new courses, system status, important new regulations, breaking news). During the summer of 2001, a new facility was added to the menu for L-AGC staff whereby information could be posted, articles and news authored outside of L-AGC referenced and relevant documents made available.

Prior to June 2001, the LaborersLEARN library required coding catalogs and abstracts in HTML, then manually moving documents to the proper locations on the development server. This required considerable technical knowledge and presented significant opportunity for error.

During the summer, several software programs were introduced to LaborersLEARN to collect information about the documents, capture the documents and automatically catalog and display catalogs without requiring HTML expertise, knowledge of the LaborersLEARN system, or technical knowledge needed to manually move the documents. Document information is no longer housed in HTML pages. Instead it is in a database that is not directly accessible through a web-browser. The results are a significant reduction in errors, increased integrity, and increased security of library contents.

8 Other WETP Initiatives:

Other initiatives involving WETP this year include working on the ANSI Z490.1-2001 standard, NIEHS/OSHA Best Practices Work, and the WETP Strategic Planning Initiative. Descriptions of each of these activities are below.

8.1 Release of ANSI Z490.1-2001 Accepted Practices in Safety, Health, and Environmental Training

On November 14, 2001, the American Society of Safety Engineers (ASSE) and the American National Standards Institute (ANSI) published the American National Standard, Z490.1 Criteria for Accepted Practices in Safety, Health and Environmental Training, approved by the American National Standards Institute on July 2, 2001. For the past four years, many NIEHS WETP staff, awardees and colleagues have worked on the subcommittee that developed this voluntary standard for training providers for safety, health, and environmental training. The standard provides important guidance to private and public sector organizations regarding the key elements of high quality safety and health training programs.

This Standard establishes criteria for safety, health, and environmental training programs, including development, delivery, evaluation and program management. This Standard is recommended for voluntary application by training providers of safety, health, and environmental training, and it is intended to apply to a broad range of training programs.

8.2 OSHA/NIEHS Best Practices Workshop

The first joint gathering of the OSHA-OTE and NIEHS Training Grants staff and their training awardees was held on April 17-19, 2001 in Chicago. IL. The meeting was in the format of a workshop focused upon the “best practices” in worker training that have been developed and evaluated over the life of the respective training grant programs. The foundation for the workshop was a recent NIEHS “best practices” document, as the NIEHS program has been more narrowly focused on a specific workplace category, HAZWOPER, unlike the diverse training provided by the OSHA awardees.

Four NIEHS best practices categories were identified:

“Core Concerns”
“Partnerships”
“Skills Enhancement”
“Advanced Training Technologies.”

Individual concurrent “Mini-Symposia” addressed each of the four categories. In each Mini-Symposia, five best practices topics specific to each of the categories were presented, explored, and discussed. The “best practices” were refined, expanded, and extended based upon the input from the participants in each session. These additional

dimensions were presented to all of the workshop participants for information, comment, and discussion in a closing plenary session facilitated by presentations by the Mini-Symposia co-chair persons.

A concluding session explored the potential interest in and opportunities for future collaboration, coordination, mentoring, and the like between the OSHA and NIEHS awardees. Major interest centered on the sharing of information and decisions with specific regard to advanced training technology applications. It was further agreed that a second joint meeting among the OSHA and NIEHS awardees in two years had merit as a means to continue and extend the dialogue developed during this first joint workshop.

For NIEHS WETP awardees, it was an opportunity to review the Best Practice approach with its core group of awardees and to obtain a fresh approach by testing the Best Practices on awardees of different safety and health training grant activities, not exclusively HAZWOPER. For OSHA OTE it was an opportunity to provide the OSHA Educational Centers and Harwood Awardees with the experiences of the NIEHS awardees.

The Workshop Report includes perspectives on each of the best practices mini-symposia categories, perspectives on each of the five best practices presented in each mini-symposia, and summaries of each presentation. In addition, summaries of the closing plenary sessions that provided reports from the mini-symposia co-chairs and discussions of the next steps in advancing collaboration and dialogue among the awardees are included. Further, a serious effort was made to include presentation materials, key documents and reports, which serve as the basis for the best practices and the workshop, and links to related resource materials and sources. These are included in the extensive appendix that accompanies the Report.

8.3 WETP Strategic Planning Process

Development of the NIEHS WETP Strategic Plan began in April 2001 with the design of a strategic planning process that was based on three key principles: (1) Stakeholder Inclusion—the idea that inputs from all stakeholder groups involved with and impacting the program (Awardees, Other Federal Agencies, Champions of the Program) should be strongly represented in the formulation of the plan; (2) Realistic Goals— the plan should be realistic and address a significant number of operational items that impact the month to month running of the program, and; (3) Peer Review Process— the plan needs to contain a review process that keeps the plan current and that helps WETP "realize that we are moving forward" and staying on track with the latest developments in the field of worker training.

The current working strategic plan is comprised of five areas considered essential to the continuing growth and sustainability of WETP:

1. Partnerships Between WETP and Other Organizations
   -This includes the need, ability and mechanisms for building partnerships.

2. Organizational Alignment of WETP Within a Larger Sphere of Influence
   -Understanding how WETP's goals and mission statement align with those of NIEHS, Awardees, Workers and other participants in the worker safety area of influence.

3. Leadership and Training, Maintaining the Human Capital
   -How to support and increase trainers in the field of worker safety.

4. Sharing Information
   -Ability to share information among stakeholder groups.

5. Operational Components of WETP
   - Improving, updating, and streamlining those operational features already part of WETP.

Threaded among these five strategic areas are four considerations that apply to the overall plan:

1. Technology Development – the importance of technology to WETP and to the worker training community.

2. Resources – how to leverage and continue existing sources, create new sources.

3. Program Integration – the integration of WETP with other existing federal education & training programs.

4. Compliance and Accountability – how to make "compliance" with programmatic deadlines a more standardized and easy process.

A final version of the WETP Strategic Plan was presented.

9 WETP Clearinghouse Update

The National Clearinghouse continued to operate as the information dissemination arm of the WETP, disseminating program information between and among the awardees, to other government agencies, and to the worker safety community. The September 11 attack on the U.S. underscores the added importance in coming years of WETP's expanded role in the education and training of workers involved in "emergency response situations", and in its expanded responsibility to keep the worker safety community informed of new safety and health precautions as the war on terrorism unfolds.

The National Clearinghouse for Worker Safety and Health Training acts 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. In addition to the day-to-day education and training responsibilities of WETP, there is the additional responsibility of leadership that comes from the NIEHS WETP being viewed as the federal government's primary worker education training program. Accordingly, part of the WETP mission is seen as the exploration of new training technologies and methods for the evaluation of training effectiveness.

The role of the National Clearinghouse is to support WETP's exploration of new ideas, to help maintain WETP's leadership role, and to advance the knowledge of worker education and training. They carry out this role by being proactive in introducing new Internet-based communication technologies by planning and managing technical workshops each fiscal year, and by assimilating quantitative program evaluation methodologies and results into the National Clearinghouse.

The four primary task areas of the contract for 2001/2002 are as follows:

- Task One: Establish, manage and operate an information clearinghouse for the distribution of technical information produced by the WETP of the NIEHS.

- Task Two: Arrange and manage two technical workshops annually related to scientific, administrative, and regulatory issues associated with training for hazardous waste workers and emergency responders.

- Task Three: Facilitate the transmission of technical information related to the development of safety and health training programs for hazardous waste workers and emergency responders.

- Task Four: Develop, analyze and compile program research products to support new training initiatives and the continuation of program efficacy measures.

10 World Trade Center (WTC) Response Update

Several thousand workers were involved in the demolition and cleanup work at Ground Zero. Besides the routine dangers involved in cutting and removing construction debris, workers may also be exposed to a host of toxicological hazards. Specialized training is required to safely work under these conditions.

Hundreds of these workers, including members of the International Union of Operating Engineers, the International Association of Fire Fighters, the International Association of Heat and Frost Insulators and Asbestos Workers, the International Association of Bridge, Structural, Ornamental, and Reinforcing Iron Workers, the Laborers International Union of North America, and the International Brotherhood of Teamsters, have received training through the NIEHS WETP.

However, Bechtel Corporation, who was hired by New York City to develop a health and safety plan for the World Trade Center site, estimated that all of the workers who were engaged in demolition and cleanup over the long haul needed additional training in areas such as handling of hazardous waste, lead, and asbestos, and working in confined spaces.

A specific training priority was to reestablish training capacity for the New York City Fire Department hazardous materials (HazMat) teams--many trainers were killed in the building collapse. Other priorities include health and safety training for site cleanup workers, health care and personnel training to support ongoing cleanup and remediation, training and certification in the use of personal protective equipment (such as respirators and suits) in the cleanup effort, weapons of mass destruction training for the HazMat workforce, and cross-training in craft skills, safety, and health for demolition and remediation workers.

Because of the WTC disaster, the NIEHS-supported HazMat operations of IAFF and the Fire Department of New York (FDNY) suffered a staggering loss of key personnel. Through their loss, our nation's hazardous materials training community has also been dealt a tremendous blow. One of our country's most veteran Hazmat Master Trainers - Chief Jack Fanning was killed. Chief Fanning was the Chief of HazMat Operations for FDNY for the past decade and a vital resource to NIEHS and IAFF Training efforts. NIEHS is fully committed to assisting IAFF and FDNY in rebuilding their HazMat response capacity.

Chemical/Biological Training Initiative

Emergency responders and industrial workers, whether they are first responders (the local police and fire departments), skilled emergency responders, or post emergency workers, typically have not received training in biological or chemical weapon response procedures. Training these professionals is a pressing national need. NIEHS has provided supplemental funds for HAZMAT training for biological weapons response through a number of existing training programs, and is ideally positioned to respond to this burgeoning training need. The program is now actively scaling up training programs in this area with the intent of providing the nation’s emergency response workers with health and safety training in this field.

11 Partnership with DOE INEEL on Advanced Training Technology Development

Over the past year, the INEEL has supported the National Institute of Environmental Health Sciences (NIEHS) in taking lessons learned from the DOE regarding the appropriate use of Advanced Training Technologies (ATT) and applying them to their Worker Education and Training Program (WETP). (The WETP funds classes all over the country to train workers at Superfund and DOE sites. Approximately one million classroom-student hours are provided each year through this program.) One of the first lessons learned at DOE was that before computer and web-based training can be widely utilized, existing training resources (electronically delivered and classroom

delivered) need to be thoroughly inventoried. Then as revisions are made or new courses are considered for development, decisions regarding those to be created for computer or web-based delivery (individualized or group/synchronously) can be made. Several factors need to be considered in these decisions. The INEEL has participated closely with a team consisting of the Director and staff of WETP and the WETP Clearinghouse.

In addition to providing strategic consultation, and as part of the fundamental inventorying efforts needed to create the baseline for future planning and decisions regarding ATT, the INEEL has contributed extensively to the creation of a Curricula Catalog of all hazardous worker courses currently being created and maintained by the 18 WETP Grantee organizations. The WETP has benefited extensively from the INEEL's ability to reuse concepts and code developed for the DOE Universal Catalog which the INEEL also built. The WETP curricula catalog is ready to be merged into a major update of the WETP Information Portal which is being maintained by the WETP Clearinghouse. The curricula catalog is also one component of the WETP Database Management System. The catalog and all the course materials collected electronically from the awardees as part of this first stage of ATT implementation will be searchable and available for use and to some extent modification and adaptation by other awardees. The course data and resources will be centerpiece to this Portal and the other resources to be provided will be cross-referenced and tied to the courses as much as possible. Some of these other resources include the regulatory documents driving the training, links to other existing agencies and organizations promoting worker education and training, etc. While the responsibility for the Information Portal has been assigned to the Clearinghouse, the INEEL's help is needed in ensuring that the INEEL-built catalog is effectively integrated into this portal.

In addition to the existing Information Portal, a new Learning Portal has been proposed by WETP and assigned to the Clearinghouse to design and prototype soon. Again, the INEEL's experience with supporting DOE in its creation and implementation of Technology-Supported Learning and the Online Learning Center as well implementing Computer and Web-based training at the INEEL is very relevant and would be of great value to the Clearinghouse. The goal of the Learning Portal is to take those courses (now in the catalog) that are ready or could be made ready for at least partial delivery via the web and make them accessible to workers. The vision is to provide a blended delivery. As appropriate, the more cognitive content for a course is delivered via the web in an individualized (and on demand) or group-based (prescheduled) fashion. The remainder of the content, particularly the hands-on aspects involving actual experience with personal protective equipment and hazardous materials and sites, would be conducted face to face at scheduled facilities. So as much as possible the online content would be packaged as Scalable Content Objects (SCOs) as per the government Advanced Distributed Learning project's specification. The INEEL has researched this specification and understands the Learning Management Systems (LMS) aspects associated with learning portals in general.

12 Conclusion

NIEHS awardees now have almost nine full years of training experience at the DOE complex. More than 100,000 workers have been trained in a wide range of Hazwoper and related courses. In many of the sites, this training is institutionalized as a routine part of the workforce training program. As sites continue to expand their attention to environmental remediation, and as more and more sites move from the planning and characterization stages to the actual cleanup activities, the need for worker training remains constant.

The evaluations of this training program have been uniformly high, and worker acceptance and confidence in this training also remains high. Some of the challenges for the next few years include the need to accommodate the changing structure of the contract relationships [and the changing contractors] between DOE and the prime contractors as well as between the prime contractors and the many new tiers of sub-contractor activity. Addressing the increased attention to advanced training technologies and their impact on this very focused hands on training activity is also a challenge to be met.

The administration of this program through the NIEHS presents some difficulties that require attention. The program does not have a permanent home in EM and, accordingly, with each DOE or EM reorganization the responsibility shifts to new people. This causes a break in the continuity and requires continued attention to reorienting the staff to the program and its value to the DOE mission. Having a stable location within the EM operation would substantially reduce the need to continually validate the existence of the program, not because of any substantive concerns, but rather as a by-product of the EM frequent reconstruction.

Conclusions to be drawn from this information:

The DOE continues to devote huge sums for environmental remediation and construction requiring hazwoper trained workers.

The dramatic restructuring of DOE's prime contractors has had a significant impact on the way workers are trained and hired as hiring moves to the third and fourth tier subcontractor level.

Training resources are no longer being managed at the prime contractor level. Instead the training resources are moving to the subcontracts at reduced levels.

NIEHS Awardees have excellent opportunities to promote the Hazwoper and related training across the DOE Complex. It will require extensive outreach to the new contractors and subcontractors in order to develop training relationships within the changed contractor operations.

During the upcoming budget year (FY 2001), NIEHS WETP will continue to support these eight primary awardees. There will be $8,076,971 (see Appendix 7) 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.

APPENDIX 1: DESCRIPTION OF THE NIEHS/DOE NUCLEAR WEAPONS COMPLEX AWARDEES

Laborers-AGC Education and Training Fund

Laborers-AGC Education and Training Fund is applying for the Hazardous Materials Worker Health and Safety Training Program for the Department of Energy (DOE) Nuclear Weapons Complex, to conduct a DOE worker training program. In partnership with the International Brotherhood of Teamsters (IBT), Laborers-AGC's DOE Worker Education and Training Program (WETP) will train workers who are or have the potential to be employed on demolition, decommission, and decontamination projects at DOE sites. The DOE WETP will provide workers with the skills and knowledge to work safely in the hazardous environments found on DOE sites and will instill a continual awareness of health and safety in all job aspects. In addition, the program will promote continuous learning, integration of safety programs, and involvement of the worker in health and safety decisions. Training includes hazardous waste worker training (exceeding Occupational Safety and Health Administration [OSHA] and DOE requirements); DOE-approved radiological worker training; and other health and safety, job skills, and environmental remediation training needed to address required and requested job-specific tasks. Training will incorporate hands-on simulated exercises, classroom instruction, and advanced training technologies.

Laborers-AGC will use eight regional training sites and two mobile units to provide training for approximately 12,500 trainees (300,000 contact hours) over five years. IBT will use four training sites to provide training for approximately 11,433 trainees (210,970 contact hours). Continuation of existing DOE training programs at both organizations will ensure immediate program initiation and will reduce training costs. This nationwide program targets laborers, teamsters, and other construction craft workers, as well as DOE personnel and DOE contractor employees.

The Hazardous Materials Training and Research Institute (HMTRI)

The Hazardous Materials Training and Research Institute (HMTRI), submits this application for funding on behalf of the Community and College Consortium for Health and Safety Training serving Department of Energy (DOE) environmental restoration and waste management sites across the United States. The intent of CCCHST-DOE is to provide convenient, consistent, and cost-effective, NIEHS approved worker training to DOE facilities, contractors, subcontractors, visiting scientists and public officials serving these facilities who are not otherwise prepared by organized labor. The primary mode of delivery will be through local Environmental Safety and Health Advanced Technology (AT) Learning Laboratories to be established at colleges and universities located near DOE sites. The AT Learning Laboratories will be supported by HMTRI curriculum and technical assistance. HMTRI, a current NIEHS awardee, will convert existing hazardous materials curriculum to an open-entry, open-exit format to be licensed by Learning Labs

and electronically delivered to students. The Learning Labs will complement curriculum with required hands-on training and instructor support. The goal is to train 10,000 workers, technicians, and supervisors annually 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 through Occupational Safety and Health Administration (OSHA) 29CFR 1910.20 and related training. CCCHST-DOE Learning Laboratories will be located at the following educational institutions, Aiken Technical College at the Savanna River Site, SC; Amarillo College at the Pantex Plant, TX; Community College of Southern Nevada at the Nevada Test Site, NV; Metropolitan Community Colleges at the Kansas City Plant, MO; and the University of Tennessee at the Oak Ridge National Laboratories, Y-12 and K-25 Plants, TN.

Over a five-year period, CCCHST-DOE will collectively enroll 30,000 students in 240,000 contact hours of hazardous materials training, providing over 30,000 8-hour units of study.

The Center to Protect Workers' Rights (CPWR)

The long-term objective of the construction consortium is to ensure that crafts workers who are called upon to work at DOE nuclear sites have the skills, knowledge and confidence they need to protect their health and safety, and that of their co-workers, their families, their communities, and the environment. Construction consortium members perform a vast array of maintenance, construction, and decommissioning tasks throughout the nuclear complex.

The Center to Protect Workers' Rights (CPWR) leads and coordinates the construction consortium, which has recently grown to include eleven international/national union members with the addition of the Electrical Workers, Plumbers and Pipefitters, and Bricklayers. The consortium has been providing training at DOE sites for six years. In the first year of this grant, the consortium will deliver 159 hazardous waste classes to 2,907 students and 196 hazardous waste refresher classes to 3,113 students. Respiratory protection, Occupational Safety and Health Administration (OSHA) 10, scaffold user, confined space, lead worker, asbestos worker, and other classes will also be offered to meet worker and contractor needs. Although contractor training facilities, such as the world-class HAMMER training center, are the consortium's primary training sites, a nationwide network of over 1,700 spacious and well equipped training centers is available. With highly skilled national and local peer-trainers; containerized, craft-specific and up-to-date training equipment; and a centralized training support organization; the consortium can respond rapidly and effectively to requests for training from anywhere within the DOE nuclear complex.

Consortium training is highly participatory, peer-led, and trade specific. Safety and health information is presented within a real-world context that readily transfers to the trainees' workplace environment. Problem solving exercises will help trainees master

the skills they need to facilitate health-related changes in their workplace. Master trainers and program managers will work with training and evaluation experts to develop and improve training exercises, as well as classroom and web-based presentations. Training development is coordinated with DOE and contractor training and safety staffs, and is responsive to their needs and those of the consortium's members. Extensive trainer, and master trainer, preparation and enhancement programs, coordinated by CPWR, will prepare a cadre of certified master trainers who can ensure the quality of their organizations' training well beyond the completion of this grant.

The New Jersey/New York Hazardous Materials Worker Training Center

The New Jersey/New York Hazardous Materials Worker Training Center, a NIEHS awardee since 1987, is requesting funds for the DOE program area. The major objective of the Center is to prevent and reduce disability, morbidity and mortality due to potential risk during hazardous waste operations and emergency response via effective health and safety training. Additionally, this Center aims to improve the systematic collection, analysis and dissemination of data to increase the understanding of health status among various populations, especially minorities, in Federal Region II.

Center members involved in this program are the University of Medicine and Dentistry of New Jersey and the University at Buffalo. Each training provider has long established relationships with the target audience which are specific to DOE sites in Federal Region II. Training at DOE sites, initiated in 1992, has included cross training in asbestos and lead, as well as hazardous waste courses. Both Center members are accredited by the New York State and City Departments of Health and the New Jersey Department of Health and Senior Services for asbestos and lead training. The sites to be targeted are Princeton Plasma Physics Laboratory, Princeton, NJ; Brookhaven National Laboratories, Upton, NY; and West Valley Demonstration Project, West Valley, NY. Training planned for Year 01 covers 115 health and safety courses reaching approximately 1127 workers at these DOE sites.

The International Chemical Workers Union (ICWU)

The International Chemical Workers Union (ICWU) is applying for a Hazardous Materials Worker Health and Safety Training for the DOE Nuclear Weapons Complex Cooperative Agreement. The long-term organizational goal of the ICWU Consortium is to institutionalize its model program within the member unions, Councils and through the support from the targeted Department of Energy (DOE) site management. The immediate educational goal of the program is to continue to deliver hazardous materials and chemical emergency response training (Occupational Safety and Health Administration final rule CFR 1910.120, paragraph e, p and q) to thousands of DOE workers who are daily exposed to a wide variety of hazardous substances. The long-term educational goal of the Consortium is to provide all students with the confidence, relevant tools and problem solving skills to identify inadequacies in their facilities'

hazardous materials programs. The intent is to continue to examine and document successes in making these programmatic and institutional improvements.

The current ICWU Consortium members on this grant are the ICWU, the Greater Cincinnati Occupational Health Center, the International Association of Machinists and Aerospace Workers, and the University of Cincinnati.

It is the aim of this proposal to continue and expand the efforts of a multi-union consortium in training workers at six nuclear facilities in the dangers of hazardous materials and launch a Multi-Grantee Project with other existing NIEHS DOE awardees. The six facilities are: Hanford, Washington; Oak Ridge, Tennessee; Kansas City, Missouri; Amarillo, Texas; Fernald, Ohio; and Albuquerque, New Mexico. Through the use of site-based worker-trainers, with the support of the ICWU CWHSE staff, over 23,000 students will be trained in the five-year period at the six sites, as well as developing trainers in the Cincinnati Center. Workers at these sites are exposed to a variety of hazards, including radiation, heavy metals, solvents, acid gases, through their normal work, as well as due to releases and other incidents in these aging plants.

The International Association of Fire Fighters (IAFF)

The International Association of Fire Fighters (IAFF) is requesting support for a DOE Nuclear Weapons Complex Cooperative Agreement. Emergency personnel responding to incidents related to the DOE complex face health and safety challenges involving radioactive and other hazardous materials. Since 1994, an average of 2,200 responders has been injured at hazardous materials incidents annually. Many more suffer serious health effects from toxic exposure associated with fire fighting and emergency response system (EMS) response. The effective remedy to combat these health effects is a flexible training program that emphasizes occupational safety and health and Occupational Safety and Health Administration (OSHA) defined responder training as a key to effective emergency response. The IAFF proposes to continue to implement such a proven training plan. This effort relies heavily on an efficient Train-the-Trainer approach. It offers three new course formats which can be customized to the specific hazards faced by a given target audience; uses a combination of the Internet, advanced training technologies and regional programs; and emphasizes Integrated Safety Management (ISM). The estimated 425 annual attendees leave the course with the knowledge and the tools needed to implement this program in local fire/rescue departments in and around ten specified DOE sites, as well as other regions upon request. The IAFF is the only national organization serving professional fire fighters and enjoys longstanding training partnerships and access with fire/rescue departments across the U.S. The training curricula are current, focused, and ready to be delivered. In addition, there is a 100-member professional fire fighter/paramedic instructor team trained in using facilitation techniques and problem-based learning to reinforce responder safety and health. It is a state-of-the-art program with a focused safety and health message provided by experienced, committed instructors.

The Operating Engineers National Hazmat Program (OENHP)

For the next five years, the Operating Engineers National Hazmat Program shall train approximately 13,635 students over the five-year cooperative agreement; annually refresh 24 master instructors and train five new instructors to maintain a viable cadre of peer instructors nationwide; annually refresh approximately 9,375 operating engineers and train 650 new students in the full Site Worker course to work at DOE hazardous waste sites; develop modules on the latest issues in safety and health, particularly deactivation and decommissioning issues for inclusion into refresher training; use refresher training as the primary vehicle for alerting target audiences working on DOE hazardous waste sites to the most recent developments; expand the use of advanced training technologies to instructors and students; develop strong, collaborative initiatives with Florida International University to recruit and train Hispanic workers near DOE sites; collaborate with the University of Kentucky to produce an effective evaluation program; integrate the lessons learned from the OENHP's unique Technology Assessment Program into the Hazardous Waste Operations and Emergency Response (HAZWOPER) training programs.

The Paper Allied-Industrial, Chemical, and Energy Workers International Union (PACE)

The Paper Allied-Industrial, Chemical, and Energy Workers International Union (PACE) is applying for the Worker Health and Safety Training for the DOE Nuclear Weapons Complex Cooperative Agreement to conduct a worker training program that will protect workers and community residents from exposure to hazardous materials, waste operations and incidents at facilities in the jurisdiction of the U.S. Department of Energy. By the end of the funded five-year period, more than 22,800 workers will receive 257,000 hours of training (Occupational Safety and Health Administration [OSHA] Standard, 29 CFR 1910.120, sections a and q) that will enable them to protect themselves during emergencies and to implement strategies to prevent potentially deadly accidents. PACE is the new union formed when the Oil, Chemical and Atomic Workers Union (OCAW) and the United Paperworkers International Union (UPIU) merged in 1999. Together, the two unions represent over 330,000 workers at some of the most dangerous industrial facilities in America. Nearly 6,000 work at DOE sites. To do this, PACE proposes the following goals:

Extensive and Intensive Training: During the first year of the proposed project, PACE intends to deliver 219 classes, reaching 3,958 workers with 46,480 contact hours of training. PACE will meet or exceed these training numbers in each of the succeeding four project years. The classes will consist of 40-hour general site worker training classes for hazardous waste site workers; 24-hour awareness classes for treatment storage and disposal (TSD) site workers and; the annual eight-hour refresher training required for all site workers to maintain their certification. Each year, worker-trainers will receive 40-hours of technical training.

New Initiatives: PACE proposes four new initiatives:1) following the DOE call for Integrated Safety Management System (ISMS) programs, three ISMS programs will be established over the next five years, and three new ISMS training modules will created for all courses; 2) the Self-sufficiency Research and Evaluation Project (SREP) initiative will be built. It uses worker-led, team-based processes to design and carry out evaluation plans; 3) 15 community/labor workshops will be conducted over five years; 4) there will be full participation in the Multi-Grantee Trainer, Curriculum and Evaluation Initiative that brings together four awardees - PACE, the ICWUC Consortium, the Operating Engineers, and the Center to Protect Worker Rights.

The program will work with a national network of support that includes: the Labor Institute for support to develop trainers, produce materials and provide guidance for the new initiatives, the University of Massachusetts at Lowell for technical assistance, the New Perspectives Consulting Group for evaluation support; and an advisory board with both management and scientific subcommittees.

APPENDIX 2: TRAINING PARAMETERS

FINAL EIGHT YEAR SUMMARY: DOE\NIEHS WORKER EDUCATION AND TRAINING PROGRAM									
TRAINING PARAMETERS[1]	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**TOTAL**
Number of Awardees	8	8	8	7	7	7	7	8	
Courses Completed	476	1,086	1,193	1,270	979	922	1,150	1,379	8,455
Workers Trained	7,107	13,566	18,642	18,394	15,048	14,049	15,813	18,833	121,452
Contact Hours	184,604	249,704	290,939	244,212	217,666	202,997	217,039	245,436	1,852,597
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	$72,488,500
Cost Per Contact Hours	$64.39	$39.61	$33.41	$36.59	$36.74	$41.56	$34.20	$33.41	$39.13

12.1.1.1 [1]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 3: FY 2000 FUNDING

DOE/NIEHS WORKER EDUCATION AND TRAINING AWARDS FOR BUDGET PERIOD 09/01/2000-08/31/2001	
AWARDEE	**DOE 9/2000 AWARD**
International Chemical Workers Union Council	$450,000
International Association of Fire Fighters	$600,000
Laborers-AGC Education and Training	$2,850,000
Paper, Allied-Industrial, Chemical and Energy Worker International Union	$1,100,000
University of Medicine & Dentistry of New Jersey	$500,000
International Union of Operating Engineers	$1,150,000
Center to Protect Workers' Rights	$1,350,000
HMTRI Kirkwood Community College	$200,000
TOTAL	**$8,200,000**

APPENDIX 4: TOTAL TRAINING BY NIEHS AWARDEE

EPA/NIEHS WORKER EDUCATION AND TRAINING TOTAL TRAINING FOR BUDGET PERIOD 09/01/2000-08/31/2001			
AWARDEE	**COURSES COMPLETED**	**WORKERS TRAINED**	**CONTACT HOURS**
International Chemical Workers Union Council	110	1,723	17,690
International Association of Fire Fighters	17	364	8,608
Laborers-AGC Education and Training	459	4,886	82,684
Paper, Allied-Industrial, Chemical and Energy Worker International Union	164	3,001	33,352
University of Medicine & Dentistry of New Jersey	80	804	7,850
International Union of Operating Engineers	119	2,497	32,872
Center to Protect Workers' Rights	374	5,193	57,262
HMTRI Kirkwood Community College	56	365	5,118
TOTAL	**1,379**	**18,833**	**245,436**

APPENDIX 5: TARGET POPULATIONS

DOE/NIEHS
TARGET POPULATIONS
09/01/2000 – 08/31/2001

TARGET POPULATIONS	COURSES COMPLETED	% COURSES COMPLETED	# WORKERS TRAINED	% WORKERS TRAINED	# CONTACT HOURS	% CONTACT HOURS
CERCLA Cleanup[1]	624	45%	10,623	56%	132,938	54%
RCRA/Industrial	155	11%	2,019	11%	27,388	11%
Emergency Response	26	2%	378	2%	8,016	3%
Radiation	51	4%	500	3%	14,000	6%
Lead Abatement	17	1%	106	1%	2,112	1%
Asbestos Abatement	158	11%	1,939	10%	39,566	16%
Hazardous Material	2	0%	27	0%	108	0%
Other	346	25%	3,241	17%	21,308	9%
TOTALS	**1,379**	**100%**	**18,833**	**100%**	**245,436**	**100%**

[1] The overall majority of training remains in the CERCLA Cleanup training.

APPENDIX 6: 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 09/01/2000-08/31/2001

SITE	COURSES COMPLETED		WORKERS TRAINED		CONTACT HOURS	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
Argonne National Laboratory	19	1%	473	3%	8,880	4%
Brookhaven National Laboratory	25	2%	396	2%	4,786	2%
Fernald Environmental Management Project	16	1%	157	1%	1,798	1%
Grand Junction	1	0%	11	0%	88	0%
Hanford	508	37%	7,167	38%	60,162	25%
Idaho National Engineering Laboratory	130	9%	1,760	9%	17,994	7%
Kansas City Plant	4	1%	70	0%	576	0%
Lawrence Berkeley National Laboratory	1	0%	19	0%	152	0%
Lawrence Livermore National Laboratory	11	1%	257	1%	5,760	2%
Los Alamos National Laboratory	27	2%	377	2%	7,840	3%
Mound Plant	15	1%	206	1%	2,336	1%
Nevada Test Site	52	4%	496	3%	9,270	4%
Oak Ridge Field Office	290	21%	3,951	21%	67,858	28%
Paducah Gaseous Diffusion Plant	25	3%	416	2%	6,374	3%
Pantex Plant	12	1%	107	0%	978	0%
Pinellas Plant	2	0%	19	0%	320	0%
Portmouth Gaseous Diffusion Plant	21	2%	310	2%	5,608	2%
Princeton Plasma Physics Laboratory	17	2%	65	0%	616	0%
Rocky Flats Office	20	1%	135	1%	3,880	2%
Sandia Albuquerqe	1	0%	7	0%	280	0%
Savannah River Site	66	5%	717	4%	13,540	6%
St. Louis Airport Site	8	1%	141	1%	2,696	1%
Weldon Spring Site Remedial Action Project	8	1%	197	1%	3,878	2%
Waste Isolation Pilot Plant	1	0%	21	0%	168	0%
West Valley Demonstration Project	49	4%	518	3%	4,974	2%
Amchitka Island Test	5	0%	74	0%	2,002	0%
Ashtabula	2	0%	38	0%	912	0%
Barker Brothers	3	0%	80	0%	702	0%
Bettis Plant	7	1%	140	1%	1,368	1%
Umtra Project Office	2	0%	53	0%	424	0%
Other1	31	2%	455	2%	9,216	4%
TOTAL	**1,379**	**100%**	**18,833**	**100%**	**245,436**	**100%**

[1] Includes: Department of Energy – Headquarters and others

APPENDIX 7: FY 2001 FUNDING

DOE/NIEHS WORKER EDUCATION AND TRAINING AWARDS FOR BUDGET PERIOD 09/01/2001-08/31/2002	
AWARDEE	**DOE 9/2001 AWARD**
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
TOTAL	**$8,076,971**