



National Institute of
Environmental Health Sciences
Worker Training Program

The National Institute of Environmental Health Sciences
Worker Training Program with the Department of Energy

NUCLEAR WORKER TRAINING PROGRAM

Accomplishments and Highlights

September 1, 2016 – August 31, 2017





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*Cover photo:
Underground Storage
Tank Removal at Idaho
National Laboratory*

NIEHS/DOE Nuclear Worker Training Program Annual Highlights

Training Data

From September 1, 2016 – August 31, 2017, NIEHS/DOE grantees:

- Trained 32,202 workers in 2,066 courses, for 389,786 contact hours
- Nearly 50 types of courses were delivered, with the most workers trained in courses critical for DOE worker and site safety: Site Worker Refresher (14,668 workers), Respiratory Protection (3,289 workers), General Construction Safety (1,969 workers), Basic Superfund Site Worker (1,529 workers), and Emergency Response for Specific Hazards (1,500 workers).
- Courses were delivered at and around 40 sites, with the most workers trained at the Hanford, Oak Ridge, Savannah River, and Los Alamos National Laboratory sites.

Safety Culture

NIEHS and program grantees have continued to focus on curricula development that will enhance safety culture at DOE sites. In the 2016-2107 funding year, both CPWR-The Center for Construction Training and Research and the International Association of Firefighters developed safety culture curricula and tailored it to DOE workers. The curricula is being pilot tested in the 2017-2018 year.

Partnerships and Connections with Fenceline Communities

The year provided clear examples of how some NIEHS/DOE grantees extend their training to communities surrounding DOE sites, which gives community members certifications and skills that increase their eligibility for employment at a DOE site. Additionally, staff from the National Clearinghouse for Worker Safety and Health Training met with the Board of the Energy Communities Alliance, and introduced them to this program.

Trainee Feedback

Here is what some NIEHS/DOE WTP trainees and site personnel are saying about the training:

CPWR – The Center for Construction Research and Training

“The instructors have a good handle on how this class is presented. The lectures, discussions, demonstrations and hands on activities and class exercises really help with this class refresher course. I like how they change the presentation every year, so it's not exactly the same course every year.”

International Association of Firefighters

“All of the hands-on scenarios, especially how to navigate inside the level A suit was beneficial. I learned how difficult it was to touch, feel and see within the suit. I finally feel confident in my job because of this class and in-depth scenarios.”

“Metering and monitoring was interesting and the best part of the class as my department doesn't train on their use and capabilities. “

International Brotherhood of Teamsters

"[O]nce again, I would like to send you a note providing feedback on my experience of the 8 hour hazardous waste training I received on 11/17/2016. The training was given by the Teamsters.... While the core material...was primarily the same as it is every year, the way it was taught and the approach was unique.... there was an excellent balance of teaching the necessary classroom information and providing multiple positive messages on personal accountability, real life experiences and examples, working as a team, and caring for the safety of others regardless of your classification in the workforce or in the public. The material and the mentoring they provided during the class was absolutely outstanding as they were able to keep the entire room engaged allowing all the employees in the room to learn from the different perspectives and experiences. [The trainers] certainly conducted a class of which HAMMER/MSA [Mission Support Alliance] can continue to build a positive model from." – Maintenance Manager, Washington River Protection Solutions (Hanford site)

Partnership for Environmental Training and Education (PETE)/Community College Consortium for Health and Safety Training (CCCHST)

It is with great pleasure and enthusiasm that I am writing to validate the success of the courses taught at Amarillo College (AC) through the grant.... For the last 3 years at the Pantex Plant, I have been a Safety Officer for the Metal Trades Council (MTC) Membership, as well as served as a volunteer Fire Support Team Member with the Pantex Fire Department. The training received through the HAZWOPER course has prepared me to take part in real emergencies and in training drills....

The way the material is presented gives many opportunities to engage in real hands-on ways to take what is learned and implement it in a way that will profit an individual's ability to have the knowledge and confidence essential to operate in a variety of roles and positions. Also taught in course is the practicality of having the hands on preparation through the exercises. Preparing the individual for a real-life scenario. The class gives the "know-how" to respond in case of an emergency event and also how to operate under normal conditions in a position which requires the application of the knowledge only acquired through HAZWOPER training....

– MTC Safety Officer, Pantex Plant

Steelworkers Charitable and Educational Organization Tony Mazzocchi Center (SCEO TMC)

"Attendees have expressed they are realizing their right to know the hazards they're working with and [that] the training gives them a better questioning attitude when they go on the job. They are more inclined to question the concerns and hazards they're facing."

"Workers were lifting heavy bags of grout to pour into a mixer during a D&D operation. There was concern that workers would injure their backs lifting the large bags. After working together and discussing their options, the supervisor ordered a palletized jack that would lift the heavy bags to the mixer level so they could be dumped with little effort. This is an example of system's thinking taught in the HAZWOPER training provided by the TMC worker-trainers."

National Institute of Environmental Health Sciences (NIEHS)/Department of Energy (DOE) Nuclear Worker Training Program

Program Goal

The goal of the NIEHS DOE Nuclear Worker Training Program is to provide high quality training to ensure that DOE site workers are prepared to work safely in hazardous environments, and that workers have sufficient knowledge to identify hazardous situations and to take appropriate actions to protect themselves, fellow workers, and the environment. To accomplish this, the NIEHS funds programs to deliver both site-specific and trade-specific training to address complicated DOE sites, featuring a combination of nuclear, industrial, demolition, and construction activities.

Program Overview

Crane operators, carpenters, welders, laborers, boilermakers, chemical operators, firefighters, construction workers, electricians, environmental technicians, insulators, laboratory technicians, machinists, painters, pipe fitters, truck drivers: these are the people who make up the workforce engaged in environmental restoration activities at DOE nuclear weapons sites. And these are the workers receiving health and safety training under the DOE/National Institute of Environmental Health Sciences (NIEHS) Nuclear Worker Training Program.

Administered since 1993 by the NIEHS Worker Training Program, the program has provided site-specific, quality safety and health training to workers in a timely and cost-effective manner, through a partnership involving government, contractors, and labor organizations. A cornerstone of the program is the use of “worker-trainers,” employees well versed in performing a given task in a hazardous environment who are trained to instruct other workers.

Protecting worker health and safety through the delivery of safety and health training has been a priority of the Secretary of Energy and is a primary goal of the Office of Environmental Management (EM). As the DOE’s mission has shifted from weapons production to environmental restoration, the site worker is exposed to new operations and hazards while conducting restoration activities, many of which are associated with potential exposure to hazardous substances and wastes.

A more detailed background of the program is described later in this report.

A National Asset in Emergency Response

The NIEHS/DOE program represents a large pool of trained, certified workers who respond in case of accidental or deliberate radiological events. While it was never imagined that this program would result in a capacity to respond to such events, this is an actual benefit and a national security asset. NIEHS WTP has developed a mechanism for identifying and mobilizing these workers.



Workers perform sub-surface sampling in Santa Susana Field Laboratory Area IV.

Activity Highlight: Community Connections and “Fenceline” Trainings

Several NIEHS/DOE grantees extend their training to communities surrounding DOE sites, which gives community members certifications and skills that increase their eligibility for employment at a DOE site. Some of these examples have made local news stories this year.

Piketon, Ohio and the Portsmouth Gaseous Diffusion Plant Site

Steelworkers Charitable and Educational Organization Tony Mazzocchi Center (TMC)

A Radiological Control Technician (RCT) course was offered by United Steelworkers (USW) Local 1-689 in Piketon, Ohio in reaction to a shortage of RCTs to do cleanup work at the Portsmouth Gaseous Diffusion Plan (PGDP) site. The course will be provided to both current DOE workers wanting to increase their skills and to community members looking for employment at the site. In a [full story by USW](#), Local 1-689 President Herman Potter explained that the shortage often means RCTs move around to different DOE sites based on job demand, losing longevity of employees at a single DOE site. The story quotes Herman, “We thought that if we train our own RCTs and help people in the community, these folks would stay at home and remain at the plant.” This story was also covered in local newspapers the [Chillicothe Gazette](#) and the [Pike County News Watchman](#).

Additionally, USW Local 1-689 provided OSHA 10-Hour courses for a local career training center. A trainer reported, “In September of 2016, the associate director of trade and industry programs of an Ohio Career Training Center contacted USW Local 1-689 TMC training coordinator. They needed [the] TMC’s help in providing hundreds of their students the 10-hour OSHA course... The USW TMC worker-trainers taught four classes in December 2016 and four in January 2017. All of the OSHA classes were filled to capacity with students. These students are now better situated to seek and attain employment at the DOE facility.”



Piketon Mayor Billy Spencer and USW President Herman Potter signed an MOU in February to use the Village of Piketon’s Administration Building to conduct training programs through the Tony Mazzocchi Center for Health, Safety, and Environmental Education.

Photo: [Pike County News Watchman](#)

Yakama Tribe in Washington State and the Hanford Site/HAMMER Federal Training Center

Steelworkers Charitable and Educational Organization Tony Mazzocchi Center (SCEO TMC)

In the spring of 2016, the SCEO TMC worked with the Tribal Employment Rights Office (TERO) of the Yakama Nation to plan a Train-the-Trainer in General Industry (OSHA 511/501 track) for tribal members. An OSHA Standards for General Industry (OSHA 511) class was conducted late winter 2017 in Toppenish, WA, and the Trainer Course for General Industry (OSHA 501) was conducted in May 2017. A total of 9 graduates completed both classes. Yakama and Communication Workers of America (CWA) trainers taught OSHA 10 and Incident Investigation trainings in the summer of 2017, initially mentored by The Labor Institute. The Yakama OSHA General Industry authorized trainers will be conducting OSHA classes through the winter and spring.

Amarillo, Texas and the Pantex Plant

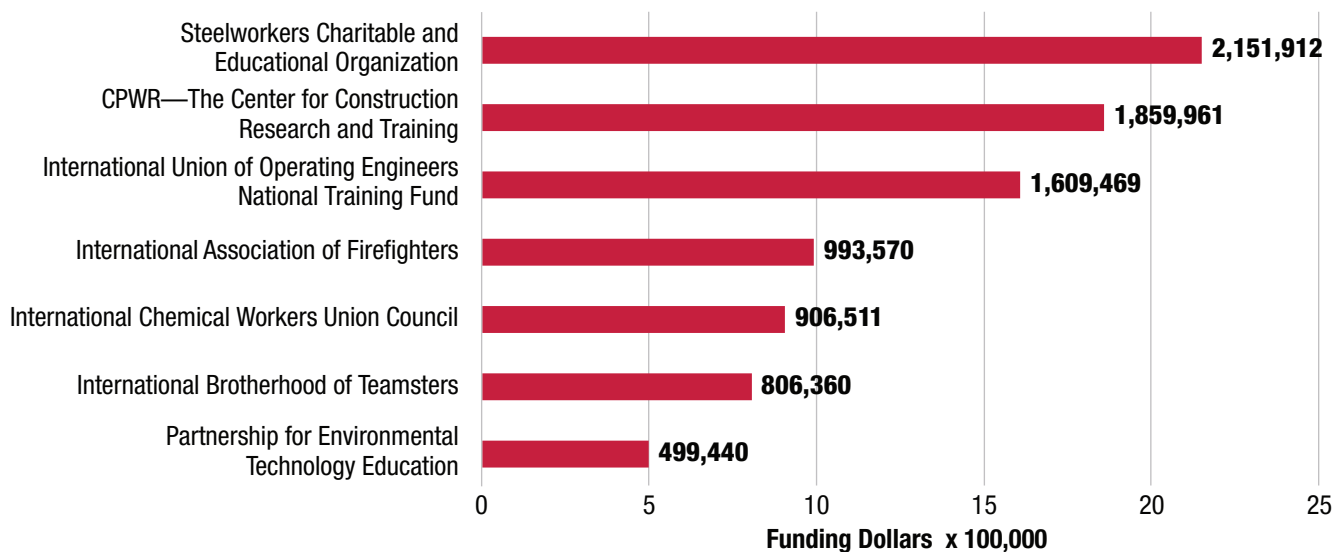
Partnership for Environmental Training and Education (PETE)/The Community College Consortium for Health and Safety Training (CCCHST)

NIEHS grantee PETE trains workers from the Pantex Plant through a subaward to Amarillo College. PETE works in partnership with the CCCHST and the Hazardous Materials Training and Research Institute. Amarillo College and Pantex are now opening their hazardous-materials training traditionally reserved for Department of Energy workers to area industries, beginning in the spring semester 2018. By expanding the training, the workers at local companies can gain specialized safety and environmental skills in asbestos, hazardous materials, and transportation. The story was covered locally by MyHighPlains.Com and KGNC News Radio.

Facts about the NIEHS/DOE Nuclear Worker Training Program, 2016-2017

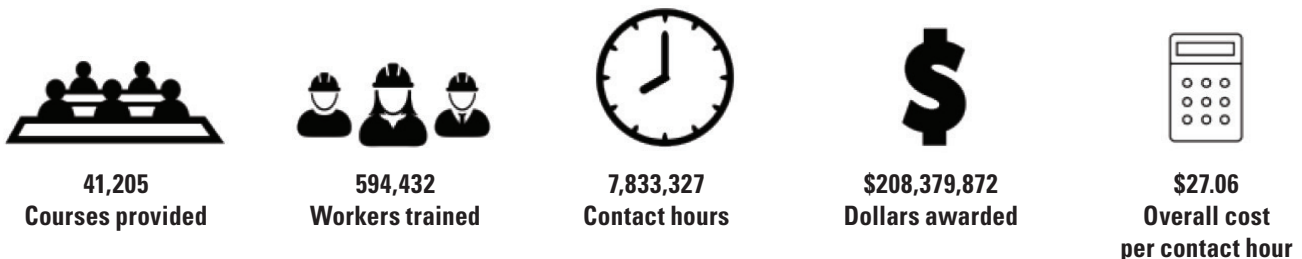
Program Funding and Awardees

Through an Interagency Agreement, NIEHS provided \$8,852,400 in funding to NIEHS awardees during the past year (September 1, 2016- August 31, 2017) with funding from FY 2016 DOE appropriations. In 2016-2017, there were seven funded awardees, plus one awardee in a no-cost extension grant status, implementing trainings. Grantees are described in more detail at the end of this report.



Training Data

Since the beginning of the program in 1994:



As a comparison to the NIEHS/DOE \$27.06 overall cost per contact hour (1994 -2017), another training grant program required less than a \$125 cost per contact hour in their Fiscal Year 2015 application budget.¹

In 2016-2017: 32,202 workers received 389,768 contact hours of training in 2,066 courses at or around 40 DOE sites.

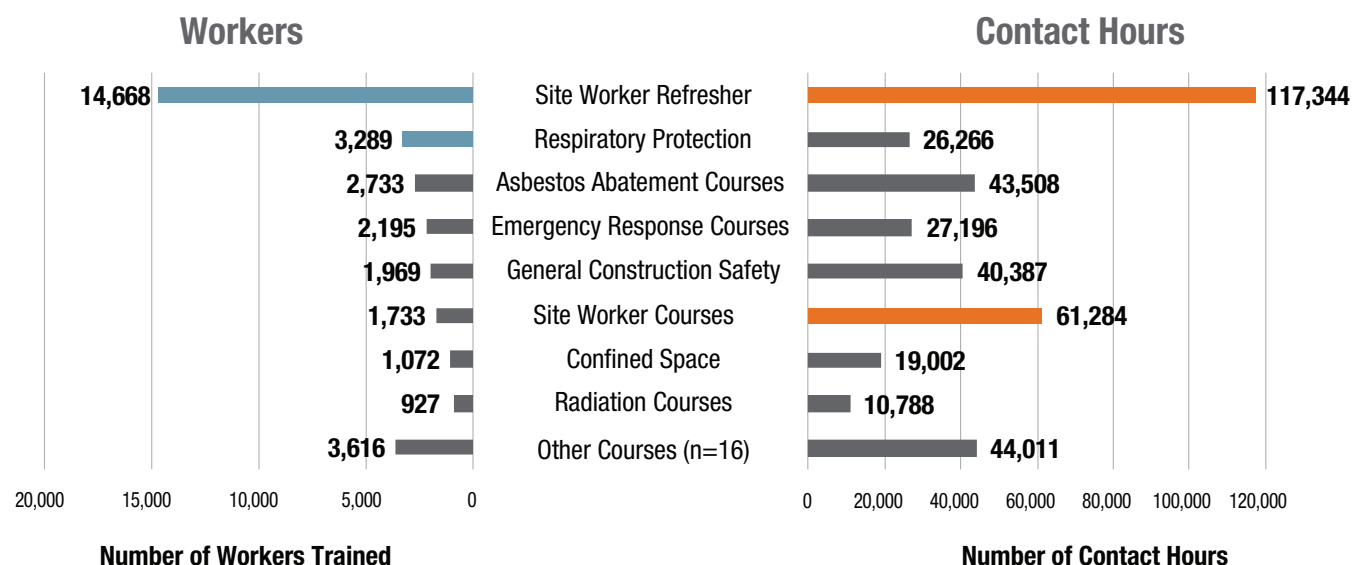
¹ Susan Harwood Training Grant Program FY 2015 Proposal Webinar: Application Budget. Slide 6. Available at <http://slideplayer.com/slide/5295005/>, Accessed January 3, 2018.

Training Course Categories

Of the 32,202 workers trained September 1, 2016 to August 31, 2017, the highest numbers were in Site Worker Refresher and Respiratory Protection courses. Of the 389,786 contact hours, the highest numbers were in Site Worker Refresher and Site Worker courses. These three courses are critical for DOE worker and site safety and ensuring worker readiness for employment. A full list of training courses, organized by categories, is available in the Data Tables section of this report.

Of the 32,202 **workers trained**, the highest numbers were in **Site Worker Refresher** and **Respiratory Protection** courses.

Of the 389,786 **contact hours**, the highest numbers were in **Site Worker Refresher** and **Site Worker** courses.



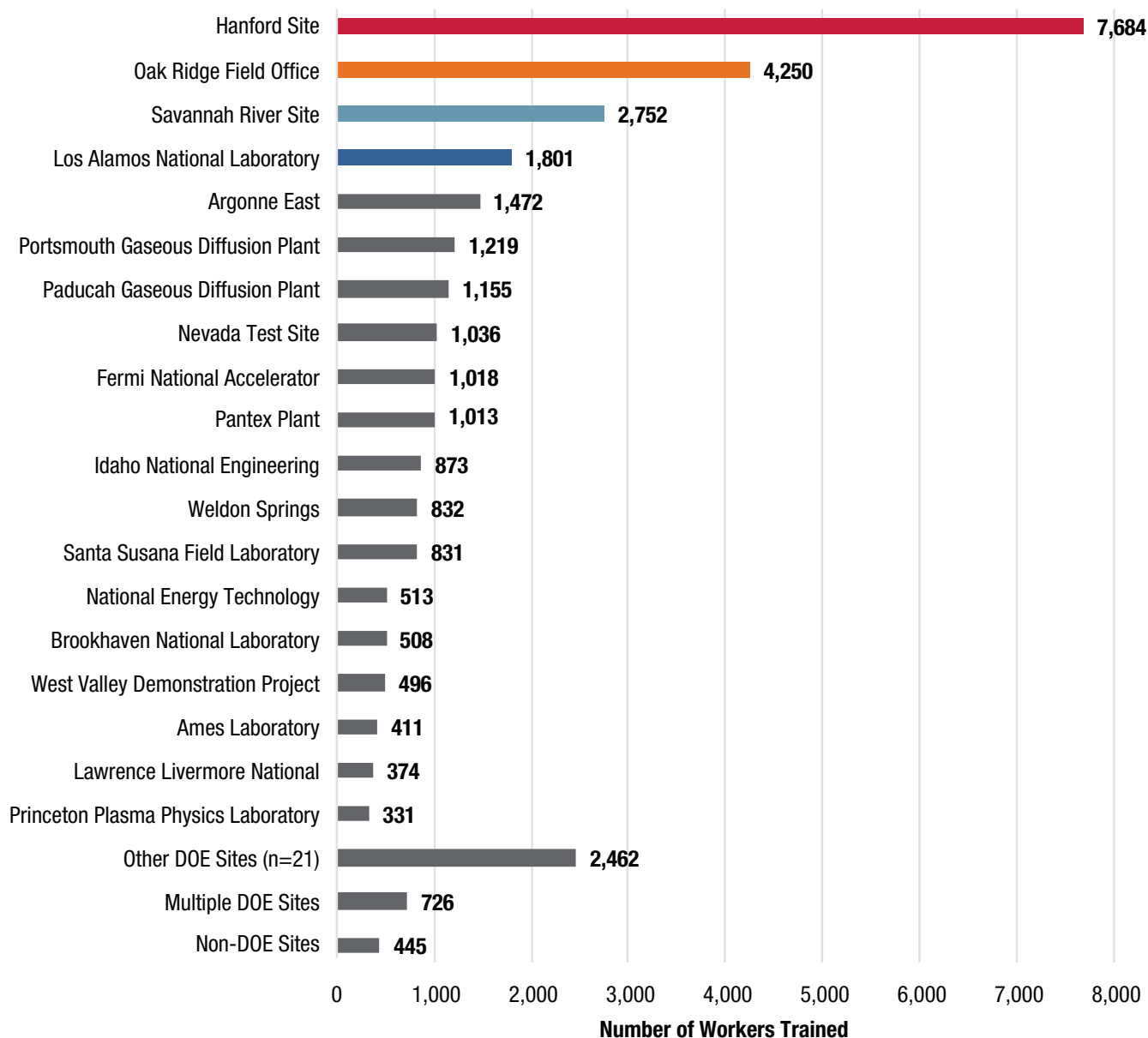
The "Other Courses" shown in the chart above are:

- Adult CPR
- Crane Operators
- Fall Protection
- Fire Watch
- Flagger
- Forklift Operator Training Program
- General Industry Safety
- Lead Abatement Courses
- Load Securement
- Microbial Remediation: Mold and Mildew
- Resource Conservation and Recovery Act/Industrial Courses
- Rigging and Signaling
- Scaffold
- Scissor Lift/Aerial Lift
- Training Methods/Trainer Development
- Trench Protection Principles of Pipe Laying

Training Locations

Training was conducted for 40 different sites from September 1, 2016 to August 31, 2017. The training for so many sites, large and small, demonstrates the national scope of this program. Additionally, the locations with the highest numbers of workers trained reflect the sites with the largest site cleanup operations for the DOE Office of Environmental Management, as discussed in their 2017 Year in Review Report. A full list of DOE sites is available in the Data Tables section of this report.

The highest number of workers trained were at the **Hanford Site**, followed by the **Oak Ridge**, **Savannah River**, and **Los Alamos sites**. Overall, grantees trained at 40 sites this year. (Sept 1, 2016 - Aug 31, 2017)





Hazardous material crash simulation training site at HAMMER Federal Training Center.

Top Courses at Top Sites

The figure below shows the courses with the most workers trained at the sites with the highest number of workers trained in the 2016-2017 program year.

The **Hanford**, **Oak Ridge**, **Savannah River**, and **Los Alamos** sites had the most workers trained overall.

The **Hanford**, **Oak Ridge**, and **Los Alamos** sites had the most workers trained in **Site Worker Refresher**, while the **Savannah River Site** had the most workers trained in **Emergency Response for Specific Hazards**.

Hanford Site

Site Worker Refresher
3,630 workers trained

Respiratory Protection
3,227 workers trained

Basic Superfund Site Worker
443 workers trained

RCRA TSD Site Worker
134 workers trained

Oak Ridge Field Office

Site Worker Refresher
2,284 workers trained

Radiation Worker II Training
601 workers trained

Basic Superfund Site Worker
226 workers trained

Asbestos Abatement Worker Refresher
225 workers trained

Savannah River Site

Emergency Response for Specific Hazards
1,500 workers trained

General Construction Safety
311 workers trained

Fire Watch
220 workers trained

Asbestos Abatement Supervisor Refresher
196 workers trained

Los Alamos National Laboratory

Site Worker Refresher
1,061 workers trained

Basic Superfund Site Worker
127 workers trained

Confined Space
264 workers trained

Fall Protection
118 workers trained

Activity Highlight: External Evaluation Findings of Selected NIEHS/DOE Grantees

Grantees often have external evaluators assess their program performance and outcomes, and provide feedback for program improvement. Below are current examples from two grantees, both evaluations completed by Dr. Ruth Ruttenberg of Ruth Ruttenberg and Associates.

Trainers as the “Go To” Health and Safety Experts in their Work Places: Survey of Trainers from International Chemical Workers Union Council (ICWUC) Consortium*

Peer trainers at U.S. Department of Energy (DOE) facilities not only teach health and safety in the classroom setting, but serve informally as the “go to” people when there is a question. In 2017, Dr. Ruttenberg surveyed 27 trainers from three sites across the U.S. Department of Energy Nuclear Weapons Complex (Hanford, Kansas City, and Oak Ridge) to assess the extent to which peer trainers are also important peer mentors on DOE sites. Trainers were from ICWUC, the International Association of Machinists and Aerospace Workers, and the International Brotherhood of Electrical Workers.

Examples of the peer mentoring by trainers in the year prior to being surveyed were many, including:

- Over 80 percent had been asked by other workers about toxic effects of chemicals. Over half were asked at least once a month.
- Nearly 90 percent had been asked a safety question by other workers – 15 percent on a weekly basis and 65 percent monthly.
- Forty percent of trainers had been asked by other workers about radiation exposure or health effects – 70 percent of them at least once a month.
- Nearly half of the peer trainers had been asked by other workers about using the right respirator – half of them at least once a month.
- Forty-five percent of trainers were asked a health or safety question by a salaried staff person – half of them at least once a month.

Dr. Ruttenberg concludes, “The peer trainers of the ICWUC consortium not only formally teach health and safety in the classroom, but, informally, they teach in the work place as well. They hold valuable expertise, recognized by salaried and hourly workers alike. Their value goes far beyond the classroom contact hours and numbers of formal students that they serve. **Increasingly, over the years, a national network of expertise is spreading across the DOE complex – with workers and their trainers, together providing a baseline of health and safety knowledge that enhances worker protections.**”

** Report issued June 2017*

2016 Evaluation Findings of the CPWR-The Center for Construction Research and Training NIEHS/DOE Worker Training Program[∞]

Dr. Ruttenberg's evaluation findings from the CPWR NIEHS/DOE program in 2016 show that once trained, workers know more and are more likely to take actions to improve their safety and health, and the safety and health of those around them. CPWR provided training for workers associated with at least 20 Department of Energy facilities during 2016. Trainees represented sites across the nation – from Hanford in Washington to the Savannah River Site in South Carolina, from Oak Ridge in Tennessee to the Brookhaven Lab in New York.

CPWR, through evaluation surveys, collected general information on work-site and exposure experiences from trainees. Participants were clearly in need of training. For example,

- Nearly sixty-five percent of those receiving refresher training (4% more than in the previous year) had previously done work requiring hazardous waste certification.
- Fifty percent of the trainees reported that they were about to do work that required Hazmat certification.

Over 90 percent of participants said that training made a difference in their workplace behavior – making them more likely to discontinue work in unsafe conditions, to change tasks due to unsafe conditions, to report unsafe working conditions, to request PPE if needed, to request an SDS, and/or to request monitoring of a confined space.

Based on their anecdotal feedback, trainees who indicated they encountered hazardous waste, soil contamination, or other worksite health hazards in the course of their work reported that the personal protective equipment (PPE) important for job safety was not always provided on the job. For example,

- Nearly 70 percent of those reported using respirators with a filter, with about 35 percent reporting using respirators with tanks or hoses.
- Chemical resistant suits had been provided to only 30 percent of trainees.
- Forty-five percent of trainees reported receiving gloves from their employers.

It should be noted, that while inadequate, the percentage of workers being provided with each type of PPE has been increasing since data were first collected in 2000 -- perhaps, in part, due to increased worker awareness and requests.

[∞] Report issued September 2017

2016 Evaluation Findings *continued*

Feedback on specific courses included:

"This course was great! Helped me to understand the importance of how the scaffold needs to be properly installed for the safety of my workers and why PPE is so important for each person on the scaffold to prevent falls/death." (Scaffold Train-the-Trainer 24 hr.)

"This class helped me improve by understanding confined spaces and the dangers that come with them. By learning and getting skills and knowledge helps me better improving my awareness and safety for myself and others around me." (Confined Space 16 hr.)

And here is one example of a report on training making a difference after-the-fact (captured during a follow-up phone interview).

A twenty-year metal trades employee, who took Hazwaste refresher training at Hammer, in the summer of 2016, told how training was responsible for deescalating what could have been a much more serious chemical exposure. The event occurred at 200 West Pump & Treat, which is part of the Hanford Site. It as a "legacy site" where ground water contamination is being remedied. An incident took place in the spring of 2016 at the water treatment plant where large conveyor belts transport the chemicals. Someone had failed to close the vents on top of some of the tanks. This resulted in chemicals in the tanks generating sulfur dioxide that was released into the air above the tanks, exposing two of the workers to the fumes. Once the workers were exposed, they could not breathe; they backed away from the open vents and were treated at the hospital and returned to work later that day. They did not suffer long-term effects.

The result of this incident was a re-evaluation of the use of the chemicals that injured the two workers and the elimination of those chemicals. Because both workers had been trained, they knew the proper procedure to follow in such an emergency and did so by backing away and leaving the area where they had been exposed. Training educates people, she said, to learn about conditions at the worksite, to avoid problems, to protect themselves, and to respond in an emergency.

NIEHS WTP and Clearinghouse Activities, 2016-2017

Safety Culture Initiatives

Two grantees implemented work under supplemental grants to develop curricula on safety culture, CPWR – The Center for Construction Research and Training and the International Association of Firefighters (IAFF).

- CPWR built on their already developed Foundations for Safety Leadership (FSL) training program to make it DOE-specific. The rationale that underlies this project is the recognized need for improving safety culture and safety climate across the DOE complex, in combination with the recognized understanding that training to empower and provide safety leadership skills to supervisors and workers is critical to improving jobsite safety climate. This project period, they established a Curriculum Development Committee (CDC) to guide the modifications of the FSL curriculum. The CDC held its first meeting at the HAMMER facility in February. During this meeting, committee members determined which DOE regulations, orders, and policies needed to be included and created an outline of the content. The group also brainstormed various workplace scenario ideas to identify DOE-specific work situations for training scenarios to be incorporated into the training program. CPWR staff are working with a multimedia company to develop this information into a DOE specific version of the CPWR Foundations for Safety Leadership training module. This FSL4DOE module will be made available to the Department of Energy National Training Center to include in the Common Core class list. The module will also be incorporated into the Safety Orientation course. CPWR will pilot the trainings in Oak Ridge, TN and Hanford, WA to refine the training content and flow.
- IAFF is expanding and enhancing existing worker training activities on Frontline Safety, revising the program to include DOE-specific case studies and incidents related to safety climate/safety culture. Training deliveries will be geared toward workers from multiple disciplines at various DOE facilities, including Savannah River National Laboratory, Oak Ridge National Laboratory, Los Alamos National Laboratory, and the Waste Isolation Pilot Plant (WIPP). This year they further advanced the curricula by navigating the history of the safety culture challenges within DOE and beginning discussions with staff at the DOE Office of Environmental Management. The IAFF collaborated with CPWR during a curriculum development meeting in February 2017 to begin initial development. Additional outreach and development was conducted in the spring, and in June 2017, the IAFF hosted NIEHS, DOE, and labor at the Denver Fire Department to observe the delivery of the existing Frontline Safety training program. This was followed by a one day development meeting where the initial revised draft instructor guide was reviewed. Comments received by participants were incorporated into the materials and it is now ready for pilot. An initial pilot occurred at WIPP in February 2018.

National Clearinghouse for Worker Safety and Health Training

The National Clearinghouse for Worker Safety and Health Training, operated by MDB, Inc., and directed by Deborah Weinstock, provides strong technical support to the NIEHS awardees that conduct hazardous waste worker training for the DOE weapons complex. The Clearinghouse regularly features articles about chemical and radiological issues around the complex in its electronic newsletter, the [Worker Training Program Weekly e-Newsbrief](#). It is distributed to over 1,500 subscribers. Newsbrief articles cover critical issues such as cleanup completion at sites, include links to recently released DOE reports, and feature DOE health and safety meetings in the Calendar of Events section.

The Clearinghouse website has a library that houses numerous reports on environmental, health, and safety topics specifically related to DOE. The Clearinghouse website contains many resources and a database of safety and health training curricula developed for DOE workers by NIEHS DOE awardees.

Planning for the 2018 National Trainers' Exchange

The National Trainers' exchange will take place May 10-11, 2018 in Phoenix, AZ where WTP grantees across programs will participate. Planning committee calls and a call for abstracts took place during the past year.

Participants will attend diverse workshops that include hands-on training demonstrations, explanations of innovative teaching strategies and skills, and presentations on using new technology to enhance training. Topics will range from respiratory training, Foundations of Safety Leadership, Enhancing Training Transfer and many others. Over two days, more than 70 sessions will be offered to approximately 300 participants. In these workshops and during discussions between sessions, participants will share and exchange best practices, experience, and techniques in health and safety training with their peers.

This is the fourth time that the WTP Trainers' Exchange will include DOE focused sessions, with trainers from across the NIEHS/DOE program attending. Additionally, many DOE staff and contractors were invited to submit abstracts and attend the event. In the past, in conjunction with the National Training Center and HAMMER, NIEHS conducted a Trainers' Exchange specifically for health and safety trainers within the DOE complex. The first was in Knoxville, TN in 2012, the second was in Richland, WA in 2015, and the third was in Albuquerque, NM in 2016.

Integrated Safety Management System and Safety Culture Initiatives

For the safety culture initiatives described above, Deborah Weinstock participated in CPWR's curricula development committee meeting in February and in the observation and development meeting for the IAFF Frontline Safety course.

Economic Impact of DOE Training

The Clearinghouse began work on an economic impact study of the NIEHS/DOE Nuclear Worker Training Program in order to better understand 1) the impact of the NIEHS training on workers' earnings and safety and health; 2) community impacts regarding land, health, and economic growth; and 3) the efficiency of the NIEHS training. This economic impact study aims to build on the work done by economists at Holy Cross who evaluated the economic impact of another WTP program. It will also

build on the work done by the Building and Construction Trades (BCT) at HAMMER/Hanford. The BCT Construction Worker Safety Training Program goals are to enhance construction workers' safety training while providing a more efficient process for getting workers hired, trained, and ready to complete tasks they were hired to do. By developing standardization of training between contractors and an equivalency process, the federal government has saved more than \$1,231,556 (combination of tuition costs avoided and labor costs avoided in 2009 and 2010).

The study of training effectiveness will begin with the assumption that the DOE cleanup work cannot be done without workers who have had extensive training for employment in the nuclear weapons plants.



Mobile Unit for transporting training equipment from the Teamsters Local Union 509, West Columbia, South Carolina.

Resources include: Project labor agreements; Collective bargaining agreements; Economic Impact Analyses from the Department of Energy sites; Data from Economic Development Councils near the DOE sites; NIEHS training data; DOE Training Institute Cost Avoidance paper; and Site-specific injury and illness data via the Computerized Accident/Incident Reporting System (CAIRS).

To date, the economists worked on the wage benefits of the training using wage data from Hanford. Next, data will be collected from Idaho Falls and Oak Ridge to do a similar analysis at those sites. There are detailed wage profiles for these locations, and one of the study goals is to compare these against similar occupations and industries in the area.

DOE Industrial Hygiene Contractors Meeting Presentation

In June 2017 at the American Industrial Hygiene Conference and Exposition in Seattle, WA, Mrs. Sharon D. Beard, from the NIEHS WTP, presented on the NIEHS DOE Nuclear Weapons Complex Training at the DOE Industrial Hygiene Contractors Meeting. During this presentation, she provided an update on NIEHS WTP DOE Training, provided insight into the specific Safety Culture Training and Collaborations, and gave a summary of the NIEHS DOE Trainers Exchange that occurred in June 2016.

DOE Training Needs Assessment of Legacy Management Sites

The Clearinghouse produced a draft DOE Training Needs Assessment of the Legacy Management (LM) sites, which looked at a number of areas including: the organization of DOE LM training programs, LM policy on personnel training, LM's safety and health program, LM job training programs, and others. The report provides suggested improvements to the LM worker training programs. Unfortunately, the Clearinghouse was unable to obtain specific data on courses and training numbers.

Meeting with Energy Communities Alliance (ECA) Board

In September 2017, Deborah Weinstock met with the ECA board to solicit input into the economic impact study and also to introduce them to the NIEHS WTP. We look forward to working with the ECA in the future on issues of shared interest, such as emergency planning and response in communities surrounding DOE sites.



Inspections of hoisting and rigging equipment at Oak Ridge.

Data Tables

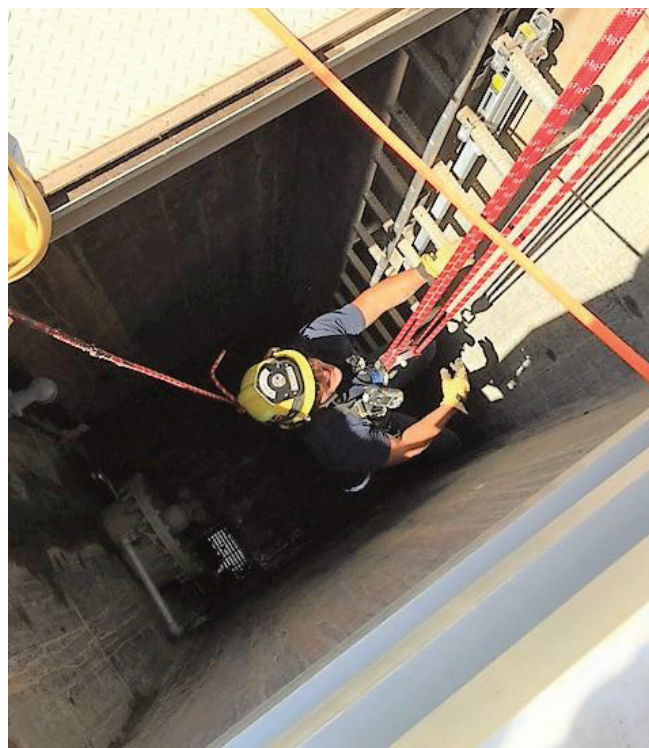
Total Training by NIEHS Awardee, September 1, 2016- August 31, 2017

Awardee	Courses Completed	Workers Trained	Contact Hours
CPWR - The Center for Construction Research and Training	398	6,327	89,738
International Association of Fire Fighters	29	645	30,408
International Brotherhood of Teamsters	190	2,882	27,638
International Chemical Workers Union Council	219	3,137	28,439
International Union of Operating Engineers	493	9,124	99,204
Laborers' International Union of North America (LIUNA) [♦]	296	3,170	54,013
Partnership for Environmental Technology Education	182	3,030	17,908
The Steelworkers Charitable and Educational Organization	259	3,887	42,438
Totals:	2,066	32,202	389,786

[♦] LIUNA participated in the program this year through a no-cost extension.



Respirator Training Area at HAMMER Federal Training Center



International Association of Firefighters training participants construct a mechanical advantage rescue/retrieval system so that they can package and remove a victim from a vertical confined space.

Courses Provided through the DOE Program by NIEHS Awardees, September 1, 2016- August 31, 2017

NOTE: Courses are presented by course category as shown in the figure on page 8. In 2018, WTP will refine these course categories.

Course Category	Course Name	Courses Completed	Workers Trained	Contact Hours
Site Worker	Basic Superfund Site Worker	111	1,529	58,904
	Site Worker Train-the-Trainer	1	11	440
	Site Supervisor Refresher	4	20	160
	Superfund Bridge Training	11	56	1,312
	Hazard Communication	7	95	380
	GHS-Hazard Communication	1	22	88
	Site Worker Totals	135	1,733	61,284
Site Worker Refresher	Site Worker Refresher	786	14,668	11,7344
	Site Worker Refresher Totals	786	14,668	11,7344
Resource Conservation and Recovery Act (RCRA) /Industrial	RCRA Treatment, Storage, and Disposal Site Worker	21	196	4,488
	Process Safety Management	5	77	616
	RCRA/Industrial Totals	26	273	5,104
Emergency Response	Emergency Response/HazMat Technician	15	316	19,680
	Emergency Response Train-the-Trainer	5	78	656
	Emergency Response HazMat Specialist	1	19	76
	Emergency Response for Specific Hazards	62	1,500	4,500
	Hospital Emergency Room Operations	2	35	280
	Awareness of Radiation Hazards for Emergency Response	1	19	76
	Computer-Aided Management of Emergency Operations (CAMEO)	1	1	40
	HazMat Transporter/Basic	15	227	1,888
	Emergency Response Totals	102	2,195	27,196
Radiation	Radiation Protection Worker/Basic	1	9	288
	Radiation Worker II Training	67	795	9,516
	Radiation Worker Refresher	13	123	984
	Radiation Totals	81	927	10,788

Course Category	Course Name	Courses Completed	Workers Trained	Contact Hours
Lead Abatement	Lead Abatement Worker Basic	1	10	240
	Lead Awareness	1	7	56
	Lead Abatement Worker Refresher	3	31	248
	Lead Abatement Supervisor Refresher	1	6	48
	Lead Abatement Totals	6	54	592
Asbestos Abatement	Asbestos Abatement Worker Basic	29	427	16,088
	Asbestos Abatement Worker Refresher	71	864	6,912
	Asbestos Abatement Supervisor	16	265	10,600
	Asbestos Abatement Supervisor Refresher	94	1,086	8,688
	Asbestos Operations & Maintenance Refresher	2	16	128
	Asbestos Inspector Certification	3	25	100
	Asbestos Management Planner	3	24	576
	Cutting & Burning	3	26	416
	Asbestos Abatement Totals	221	2,733	43,508
Other Courses	Adult CPR	81	521	3,376
	Confined Space	85	1,072	19,002
	Crane Operators	5	115	920
	Fall Protection	20	278	3,308
	Fire Watch	26	360	1,836
	Flagger	2	18	100
	Forklift Operator Training Program	2	38	432
	General Industry Safety	31	485	6,787
	General Construction Safety	147	1,969	40,387
	Load Securement	16	129	832
	Microbial Remediation: Mold and Mildew	2	34	272
	Respiratory Protection	177	3,289	26,266
	Rigging and Signaling	78	817	11,432
	Scaffold	8	77	1,084
	Scissor Lift/Aerial Lift	2	17	136
	Training Methods/Trainer Development	14	194	5,816
	Trench Protection Principles of Pipe Laying	13	206	1,984
	Other Courses Totals	709	9,619	12,3970
OVERALL TOTALS		2,066	32,202	389,786

Total NIEHS Training by DOE Site, September 1, 2016- August 31, 2017

Site Name	Courses Completed	Course Percentage	Workers Trained	Workers Percentage	Contact Hours	Contact Hours Percentage
Amchitka Island Test	10	0%	137	0%	4,684	1%
Ames Laboratory	21	1%	411	1%	4,382	1%
Argonne East	73	4%	1,472	5%	24,424	6%
Ashtabula	10	0%	154	0%	2,942	1%
Barker Brothers	23	1%	278	1%	4,700	1%
Bettis Plant	21	1%	298	1%	3,318	1%
Brookhaven National Laboratory	31	2%	508	2%	11,286	3%
Department of Energy - Headquarters	8	0%	163	1%	3,082	1%
Department of Energy - SF	2	0%	45	0%	1,800	0%
Elk River Reactor	2	0%	48	0%	1,536	0%
Fermi National Accelerator Laboratory	22	1%	1,018	3%	9,200	2%
Fernald Integrated Demonstration Site	1	0%	18	0%	720	0%
Formerly Utilized Sites Remedial Action Program	21	1%	200	1%	2,618	1%
Grand Junction	1	0%	15	0%	150	0%
Hanford Waste Vitrification Plant	425	21%	7,684	24%	78,894	20%
Idaho National Engineering Laboratory	88	4%	873	3%	11,136	3%
Kansas City Plant	45	2%	266	1%	2,192	1%
Lawrence Berkeley	6	0%	80	0%	900	0%
Lawrence Livermore National Laboratory	27	1%	374	1%	4,912	1%
Los Alamos National Laboratory	113	5%	1,801	6%	14,945	4%
Moab UMTRA Project	5	0%	64	0%	1,024	0%
Mound Plant	1	0%	7	0%	56	0%
Multiple DOE sites	47	2%	726	2%	16,214	4%
National Energy Technology Laboratory	29	1%	513	2%	7,312	2%
Nevada Test Site	78	4%	1,036	3%	12,116	3%
Non-DOE Sites	35	2%	445	1%	5,968	2%
Oak Ridge Field Office	308	15%	4,250	13%	55,095	14%
Paducah Gaseous Diffusion Plant	84	4%	1,155	4%	14,276	4%
Pantex Plant	72	3%	1,013	3%	8,984	2%
Pinellas Plant	1	0%	17	0%	680	0%
Portsmouth Gaseous Diffusion Plant	86	4%	1,219	4%	14,112	4%
Princeton Plasma Physics Laboratory	13	1%	331	1%	5,240	1%
Rocky Flats Office	2	0%	33	0%	2,640	1%
Santa Susana Field Laboratory	69	3%	831	3%	9,126	2%
Savannah River Site	167	8%	2,752	9%	23,394	6%

Table continued on next page.

Site Name	Courses Completed	Course Percentage	Workers Trained	Workers Percentage	Contact Hours	Contact Hours Percentage
Separations Process Research Unit at Knolls Lab	18	1%	281	1%	2,528	1%
St. Louis Airport Site	17	1%	237	1%	5,468	1%
Stanford Linear Accelerator Center	3	0%	46	0%	1,200	0%
Thomas Jefferson National Accelerator Facility	5	0%	37	0%	552	0%
Umtra Project Office	2	0%	38	0%	352	0%
Weldon Springs	41	2%	832	3%	10,644	3%
West Valley Demonstration Project	33	2%	496	2%	4,984	1%
Totals	2,066	100%	32,202	100%	389,786	100%

10 Year Training Summary: NIEHS/DOE Worker Training Program 2008-2017

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Number of Awardees	8	8	8	8	8	8	8	8	7	7
Courses Completed	2,225	2,265	2,188	1,987	1,963	1,797	1,900	1,830	1,927	2,066
Workers Trained	33,702	36,266	35,329	31,238	29,842	27,755	28,334	26,396	28,162	32,202
Contact Hours	414,746	530,271	523,287	405,556	365,083	310,369	311,412	323,316	368,680	389,786
Dollars Awarded	\$9,358,264	\$9,510,125	\$9,670,474	\$9,577,000	\$9,599,741	\$8,760,715	\$8,760,685	\$9,543,426	\$8,827,223	\$8,852,400
Cost Per Contact Hour	\$22.56	\$17.93	\$18.48	\$23.61	\$26.29	\$28.26	\$28.13	\$29.52	\$23.94	\$22.71



Protective Suit Display at HAMMER Federal Training Center

Summary of NIEHS Training at DOE Sites, 1994-2017

Training Year	Total Courses	Total Workers	Total Contact Hours
1994	486	7,107	184,604
1995	1,091	13,566	249,704
1996	1,199	18,642	290,938
1997	1,277	18,394	244,212
1998	983	15,048	217,666
1999	922	14,049	202,997
2000	1,152	15,860	218,087
2001	1,379	18,833	245,436
2002	1,954	25,399	302,723
2003	1,959	23,187	303,633
2004	2,367	29,240	374,957
2005	1,961	25,442	329,840
2006	2,044	26,365	325,533
2007	2,283	34,074	400,491
2008	2,225	33,702	414,746
2009	2,265	36,266	530,271
2010	2,188	35,329	523,287
2011	1,987	31,238	405,556
2012	1,963	29,842	365,083
2013	1,797	27,755	310,369
2014	1,900	28,334	311,412
2015	1,830	26,396	323,316
2016	1,927	28,162	368,680
2017	2,066	32,202	389,786
Totals:	41,205	594,432	7,833,327

Background of the NIEHS/DOE Program Partnership

Worker Training Program Authorization

The Superfund Amendments and Reauthorization Act of 1986 (SARA), Section 126(g), authorizes an assistance program for training and education of workers engaged in activities related to hazardous waste generation, removal, containment or emergency response and hazardous materials transportation and emergency response. The Congress assigned responsibility for administering this program to the National Institute of Environmental Health Sciences (NIEHS), an Institute of the National Institutes of Health (NIH) within the Public Health Service (PHS) of the US Department of Health and Human Services (DHHS).

Defense Authorization

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 at Department of Energy (DOE) nuclear weapons facilities; and to develop response curricula for such training and education.” The Secretary was further authorized in Section 3131(a)(2)(A)-(B) to make the training awards to non-profit organizations demonstrating capabilities in: “implementing and conducting effective training and education programs relating to the general health and safety of workers; and identifying, and involving in training, groups of workers whose duties include hazardous substance response or emergency response.”

NIEHS/DOE Agreement

To implement this, DOE entered into an agreement with NIEHS to award and administer the grants and to adapt its existing program to meet the needs of the DOE nuclear weapons complex.

Occupational Safety and Health Administration (OSHA) Regulations

To provide protection to workers' health and safety, all workers at DOE sites engaged or potentially engaged in environmental restoration activities, including hazardous substance response or emergency response, are required by the Comprehensive Environmental Response, Compensation, and Liability Act and respective DOE Orders to meet the requirements of the OSHA regulations 20 CFR 1910.120 and the Environmental Protection Agency Hazardous Waste Operations and Emergency Response (HAZWOPER) training requirements (40 CFR 300.150).

NIEHS/DOE Awardees

CPWR—The Center for Construction Research and Training

CPWR - The Center for Construction Research and Training is sponsored by North America's Building and Construction Trades Unions (BCTD), which represents 14 international/national building trades unions and over 3 million workers. Their training consortium includes the following international and national construction unions: Insulators & Asbestos Workers, Iron Workers, Boilermakers, Painters, Bricklayers, Plasterers & Cement Masons, Carpenters, Plumbers & Pipe Fitters, Electrical Workers, Sheet Metal Workers. These unions represent over 3,000,000 workers.

International Association of Firefighters (IAFF)

IAFF has more than 3,100 affiliates, representing over 300,000 fire fighters and paramedics in more than 3,500 communities in the U.S. and Canada.

International Brotherhood of Teamsters (IBT)

Through partnerships with major trucking and rail unions, The International Brotherhood of Teamsters – National Labor College Consortium works with: 1) remediation site workers and supervisors at DOE facilities; 2) construction workers and supervisors involved in the remediation of DOE facilities, including drivers of specialized off-road and waste hauling vehicles; 3) truck transportation workers and supervisors who are involved in the transportation of radioactive waste and chemical waste from DOE facilities; and 4) railroad workers and supervisors involved in the transportation of radioactive waste and chemical hazardous waste from DOE facilities.

International Chemical Workers Union Council (ICWUC) Center for Worker Health and Safety Education

The ICWUC Center for Worker Health & Safety Education provides training on the dangers of hazardous materials and waste at nuclear facilities, and includes the following consortium partners for the DOE program: International Association of Machinists and Aerospace Workers (IAM) and the University of Cincinnati.

International Union of Operating Engineers (IUOE) National Training Fund

The IUOE represents approximately 329,000 workers including operating engineers (heavy equipment operators, mechanics, and surveyors), stationary engineers who maintain buildings and industrial complexes, nurses and other health workers, and a variety of public employees.

LIUNA Training and Education Fund[‡]

Laborers' International Union of North America (LIUNA) services the training needs of hundreds of LIUNA local unions and thousands of construction-related contractors by providing relevant and necessary training to LIUNA members and apprentices. Each year thousands of LIUNA members and apprentices receive training at one of the state-of-the-art training facilities that comprise the Laborers' training network.

[‡]LIUNA participated in the program this year through a no-cost extension.

Partnership for Environmental Training and Education (PETE)

The Community College Consortium for Health and Safety Training (CCCHST) is administered by PETE. There are over 120 partners represented in CCCHST, including colleges and universities, community-based organizations, governmental units, independent training providers, and a union. These groups offer hazardous waste training in most states in the nation.

The Steelworkers Charitable and Educational Organization (SCEO)

The SCEO represents approximately 875,000 members who form 3,500 local unions located in every state, with more than 3,800 members in seven states, through six union locals, at six DOE sites. USW has established health and safety training programs and fields more than 200 national and site worker-trainers who recruit and train workers. Approximately 336,000 USW members are concentrated in the paper, petroleum, chemical, rubber, plastics and primary metals industry groups, all of which contain large quantities of hazardous waste, and experience large quantities of toxic releases.

For more information, visit https://www.niehs.nih.gov/careers/hazmat/about_wetp/doe/index.cfm.



National Institute of
Environmental Health Sciences
Worker Training Program

March 2018