Successful Training Partnerships: Lessons Learned
Report of the Technical Workshop
January 23-24, 1997
George Meany Center for Labor Studies
Silver Spring, Maryland

Sponsored by the
National Institute of Environmental Health Sciences
Worker Education and Training Program

in conjunction with its

National Clearinghouse for Worker Safety and Health Training
for Hazardous Materials, Waste Operations, and Emergency Response
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January 23-24, 1997
George Meany Center for Labor Studies

JANUARY 23, 1997

8:00 Registration/Coffee

8:30 WELCOME
Sue Schurman, Executive Director, George Meany Center for Labor Studies
Denny Dobbin / Chip Hughes, National Institute of Environmental Health Sciences (NIEHS)
Deborah Weinstock, National Clearinghouse for Worker Safety and Health Training

8:45 Results of the NIEHS Program Evaluation RE: Partnerships
Glenn Paulson, External Review Panel, NIEHS Worker Training Program

9:00 Perspective of the Client Agencies: Moderator: Denny Dobbin
Tim Fields, Deputy Assistant Administrator, Environmental Protection Agency
Al Alm, Assistant Secretary for Environmental Management, Department of Energy

9:30 Break

9:45 PLENARY I: Panel on Superfund Cleanup, Moderator: John Moran, International Union of Operating Engineers

Construction Workers in DOE: James Meredith, Training Director, MK Ferguson, and Vern McDougall, United Brotherhood of Carpenters (UBC)

National Training Market: Harold Ganganth, Manager of Labor Relations, Foster Wheeler Corporation and Bill Bergfield, Laborers-AGC

11:00 PLENARY II: Panel on Hazardous Waste TSD and Collateral Duty Emergency Response, Industrial, Moderator: John Morawetz, International Chemical Workers Union (ICWU)

Workers Training Workers: Rob Schroeder, Assistant Human Resources Manager, Libbey, Inc., Robert St. John, Corporate Manager of Environmental Safety and Health, Libbey, Inc., Don Dudley, President, American Flint Glass Workers Union, Local 700, and Bruce Mahan, Field Training Director, ICWU Training Center

UAB/CLEAR Training Program: Margaret Fiestar, American Forest and Paper Association, Gordon Brehm, Assistant to the President International Paper Workers Union, and Barbara Hilyer, University of Alabama at Birmingham

12:15 CHARGE TO BREAKOUT SESSIONS, Chip Hughes, NIEHS

12:30 Lunch
AGENDA
SUCCESSFUL TRAINING PARTNERSHIPS: LESSONS LEARNED
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1:30 BREAKOUT SESSIONS
1. Curriculum and Training Methods: Moderator: Audrey Gotsch; Recorder: Alex Ruttenberg
2. Criteria for Training Programs: Moderator: Mike Merrill; Recorder: Deborah Weinstock
4. Minority Worker Training Issues: Moderator; Bob Bullard; Recorder: Sharon Beard

4:00 REPORT BACK ON BREAK OUT SESSIONS: LESSONS LEARNED, Moderator: Denny Dobbin

5:00 Adjourn for the day / Social Hour

JANUARY 24, 1997

8:00 Coffee

8:30 PLENARY III: Panel on Emergency Response, Municipal, Moderator: Brad Sant, International Association of Fire Fighters

AFSCME Labor-Management Partnerships: Robert Troolin, Loss Control Manager, City of Duluth and Bill Marquardt, American Federation of State, County, and Municipal Employees (AFSCME)

Railway Workers HAZMAT Project: Joe Carmean, Manager of Operating Assets, Conrail, Harold French, Local Chairman, Local #6876, Transportation/Communications International Union, Gary Maslanka, President, Local 2020, Transport Workers Union, and George Meany Center

9:45 Break

10:00 PLENARY IV: Panel on Small Business Partnerships, Moderator: Chip Hughes, NIEHS


A Pre-Apprenticeship Project: Mark Deathridge, President, E. Tennessee Mechanical Contractors Inc., Oak Ridge, TN, Dan Maples, President, Knoxville Building Trades Council, and Vern McDougall, UBC

DePaul Small Business Partnership: Carol Jacklin, Human Resources Manager, Web Tool Company, and Tiipawan Reed, DePaul University

11:30 WRAP UP
Glenn Paulson

12:30 Adjourn
Forward

Workers deserve training that works for them, especially when it comes to protecting their health and safety. The NIEHS Training Partnership Workshop was one means of exploring the ways in which that is happening.

Federally-supported worker training aims to train hazardous waste operations and emergency response (HAZWOPER) workers to be able to do their job, while at the same time protecting themselves and the communities in which they work from harm. Indeed, I firmly believe that all workers are entitled to training that really contributes to preventing work-related harm - that is their training must be effective as far as those of us who are responsible for training programs can make it so.

Those of us who are responsible for training must pay close attention to worker health and safety training quality as one key way to help assure that the training is contributing to lower injury and illness rates and thus, lower costs - both in terms of human suffering and financial expenses. While the definitive measurement of the relative contribution of training toward this goal is methodologically extremely difficult to do, the NIEHS Partnership Workshop demonstrated a variety of means in which companies and training providers have shown that they are meeting the goal of injury and illness prevention we all strive for.

In addition, I believe high quality health and safety training for workers involved with hazardous materials is good public policy and should be a high priority to the country. Such high quality training:

- enhances job skills;
- helps reduce health care costs by preventing work-related injury and illness;
- and contributes to a cleaner and safer environment in both the workplace and in the communities in which the work is being conducted.

The Partnership Workshop takes the specific lessons we learned about how to best implement worker health and safety training programs for HAZWOPER so that they may be applied more generally to all training related to hazardous materials in the workplace. The Partnership Workshop is part of a continuing effort of the NIEHS model training program to better worker health and safety training.

Congress wrote strong provisions for worker protection in SARA. The statute calls for a minimum of 40 hours of initial training for supervisors and workers "engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances..." SARA required the Occupational Safety and Health Administration (OSHA) to promulgate standards for the health and safety protection of employees in this area. OSHA final rule 29 CFR 1910.120 Hazardous Waste and Emergency Response Operations was promulgated on March 6, 1989 with an effective date of March 6, 1990. Similar worker training provisions have since been written into the Asbestos Hazardous Emergency Response Act and recent Lead-based Paint legislation for HUD.

The NIEHS model training programs for hazardous waste workers and emergency responders satisfy minimum requirements as specified in Federal OSHA rules and other related regulations that have been promulgated. Further these training programs also meet the minimum requirements specified in the Minimum Criteria for Worker Health and Safety Training for
Hazardous Waste Operations and Emergency Response, published April 1990 as a result of an NIEHS sponsored technical workshop on training quality. These criteria were developed in the absence of others through a consensus of expert representatives of management, labor, academia and other governmental agencies and have been the lodestone pointing the way to better training since.

More recently, a 1993 NIEHS-sponsored workshop furthered the usefulness of the minimum criteria by developing a document that provided interpretive guidance including detail regarding what the educational goals should be and defined appropriate means to achieve them. Both documents became the basis for Appendix E of 29 CFR 1910.120 (59 FR 43268, August 22, 1994) which now gives official guidance to all those covered by the rule about the constitution of high quality training programs.

NIEHS continues to support activities to make training better. For example NIEHS supported a student intern to organize and summarize the program evaluation data reported by individual awardees to NIEHS. NIEHS awardee evaluation must demonstrate not only effective training program implementation, but also impacts on the health and safety of workers. The findings clearly demonstrate that NIEHS grantees have responded to the challenge for program evaluation and have documented significant changes in health and safety of workers and communities across the U.S.

Then, during March, 1996, NIEHS sponsored the first national conference on Measuring and Evaluating the Outcomes of Hazardous Waste Worker Training to examine the methods, which have been developed by various programs to document the effectiveness of training activities. Drawing on public health experts in the evaluation field, awardee representatives spent two days exploring the methodological issues that underlie the collection of program effectiveness data. Breakout sessions examined issues from trainee comprehension of curricula to outcome results in the workplace after training had taken place. The significant resources that have been allocated for NIEHS training awards require that recipients demonstrate not only effective implementation, but also positive impacts on the health and safety of trained workers. The findings reported at the technical workshop clearly demonstrate that NIEHS grantees have responded to the challenge of program evaluation and have documented notable improvements in the health and safety of workers and communities across the United States.

After the technical workshop, an ongoing effort was established to publish this guidance manual on program evaluation to benefit other organizations that grapple with safety and health training evaluation issues as a means of more effectively measuring training program quality.

Legitimate quality assurance program examines quality issues from bottom to the top. In May 1995, NIEHS management established a special External Panel of outside peer reviewers with a specific charge: 1) to review and evaluate the overall NIEHS Superfund Worker Training Program taking into consideration program quality, output, productivity and impact, and 2) to make any recommendations considered appropriate by the Panel with regard to future directions for the NIEHS program. The Panel met twice at NIEHS, in June and October, 1995. Before, during and between these meetings, the Panel reviewed extensive materials on the worker training program, analyzed the program in depth, and developed its findings, recommendations and conclusions. A final report from the External Review Committee was completed December 1995 and found that the program was meeting its goals and gave new recommendations to help it to continue to improve.
To date, the NIEHS worker training program has successfully trained over half a million workers in how to better protect themselves and the communities in which they work from work-related harm. Lessons we have learned about how to replicate these successes form the basis of this Partnership Workshop Report. Please use it in your own training programs to make them better still for workers everywhere.

Denny Dobbin, Program Administrator
NIEHS Worker Education and Training Program
April 1997
EXECUTIVE SUMMARY

The National Institute of Environmental Health Sciences (NIEHS) workshop on “Successful Training Partnerships: Lessons Learned” brought representatives of industry, small business entrepreneurs, labor, academia, and government together to share the diverse nature of their partnerships and the details of how to make them work. Creative arrangements and traditional partnerships were both revealed, and there were lessons to be learned from all partnerships discussed.

The purpose of the workshop was to gather NIEHS awardees and their clients together to discuss what elements are integral to forming successful training partnerships. Each awardee has its own successes and paths to that success. Congregating the various awardees and wide variety of clients together provided the opportunity for each participant to learn from one another and to share their experiences with forming partnerships.

EPA Assistant Administrator expressed his support of EPA’s role in the Worker Training Program. He felt strong that both the Superfund Worker Training Program and the Minority Worker Training Program would continue to see adequate levels of funding. DOE Assistant Secretary for Environmental Management Al Alm expressed his dedication to safety and health and said that productivity and safety are two sides of the same coin.

One common theme throughout the workshop was that partnerships are often difficult to start, are hard to nurture and grow, and are likely to have some rough stretches, even in the best of circumstances. Trust, honesty, and a commitment to cooperation seem to be the glue that holds partnerships together. Another useful ingredient for a successful, long-term partnership is continuing support from the “people at the top” or upper management. Enlightened self-interest is a critical feature for all partners; only with this can there be a win-win result for all parties, including the trainees.

All the success stories presented seemed to have at their core, embodied in at least one of the partners, an infrastructure already in place that had both facilities and trainers. None of the success stories were built on ad-hoc arrangements. For many, the infrastructure was directly attributable to NIEHS financial support. For others, NIEHS support had allowed a pre-existing infrastructure to expand activities, audiences, etc., in significant ways.

Some unusual alliances have been formed, both by academic-based training institutions and by labor or labor-management training organizations. For example, Webb Tool, Inc. a small business, formed a partnership with DePaul University and with OSHA after being inspected and cited for several violations.

The NIEHS Worker Training Program has provided hazardous materials training to half a million workers. Partnerships between provider and client are one reason this success is possible.
I. Introduction

Purpose of the Workshop

The Worker Education and Training Program of the National Institute of Environmental Health Sciences (NIEHS) sponsored a technical workshop on “Successful Training Partnerships: Lessons Learned” January 23-24, 1997 in Silver Spring, Maryland at the George Meany Center for Labor Studies. Representatives from industry, small businesses, labor, academia, and government agencies participated.

In 1995, NIEHS established a special external panel of eight national experts charged with reviewing and evaluating the overall NIEHS Worker Training Program. One of the panel’s recommendations was that NIEHS should put considerably more emphasis on encouraging participation and active involvement of employers in the grant program.\(^1\) It was this recommendation which prompted NIEHS to convene the Successful Training Partnerships workshop.

The purpose of the workshop was to gather NIEHS awardees and their clients together to discuss what elements are integral to forming successful training partnerships. Each awardee has its own successes and paths to that success. Congregating the various awardees and wide variety of clients together provided the opportunity for each participant to learn from one another and to share their experiences with forming partnerships.

Background to the NIEHS Worker Training Program

As the volume of hazardous waste being produced in the U.S. increases, national concern about hazardous waste generation continues to grow. There is also concern for the health and safety of approximately two million workers responsible for cleaning up hazardous waste sites, handling toxic spills, and responding to a wide variety of hazardous waste incidents. Exposure to hazardous material puts workers at great risk for accidents and other injuries that can have tragic outcomes. In order for such workers to perform their duties safely and efficiently, they need to be equipped with knowledge and skills that are specific to the work they do. Better focused training can effectively reduce the number of incidents and costs of workplace injuries to workers, employers, and the nation.

Traditionally, training efforts for workers exposed to hazardous materials have not been very effective because of the following problems:

Inadequate training -- using standard models and videotapes which have little impact on learning and knowledge.

2. Difficult demographics -- most of the workers are relatively young and often disproportionately drawn from special populations.

3. Limited literacy and knowledge of English for many workers.

\(^1\) An Evaluation of the National Institute of Environmental Health Sciences Superfund Worker Training Grant Program, External Panel Report, December 1995.
4. High turnover.

In 1986, Congress mandated a program to provide more effective safety and health training for hazardous waste workers -- one that would develop and implement model programs in order to provide more effective training nationwide. The Superfund Amendments and Reauthorization Act of 1986 (SARA) gave NIEHS the responsibility to develop and administer this program. The program currently funds 20 primary awardees and over 70 sub-awardees.

The NIEHS Worker Education and Training Program supports the development of model worker safety and health training development in the following areas:

- **Superfund Worker Training** - This training assistance program is for the training of workers who are, or may be, engaged in activities related to hazardous waste removal or containment or chemical emergency response.

- **Nuclear Weapons Cleanup Training** - This program is targeted for workers engaged in environmental restoration, waste treatment, and emergency response activities at sites in the Department of Energy’s nuclear weapon complex.

- **Minority Worker Training** - This program is focused on delivering comprehensive training to disadvantaged minority youth in order to prepare them for employment in the environmental restoration and hazardous materials field.

II. **Perspective of the Client Agencies**

**The NIEHS-Environmental Protection Agency (EPA) Partnership**

Administered by NIEHS through an interagency agreement with EPA, this Worker Training Program was initially authorized for five years (FY 87-91). Since then, the EPA-NIEHS program has grown to $21 million for Superfund worker training and $3 million for Minority Worker job training and placement.

The major efforts and achievements in worker training include:

- **C** More than 500,000 workers have been trained in remediation, emergency responder, and treatment storage, and disposal facilities (TSD) health and safety.

- **C** EPA's joint efforts with NIEHS to support Minority Worker Training are preparing inner-city youth for career-path jobs related to environmental cleanup. In the first year of the Minority Worker Training Program, 376 people of color have been trained and placed in jobs. Job placement following a training program is the critical component that deems its success, and is missing from many similar programs.

Speaking at the workshop, Tim Fields, EPA, Acting Assistant Administrator, said there will be an increase from $1.4 billion to $2.1 billion for Superfund in the Presidential budget over the next four years. There are 450,000 contaminated industrial sites across the country which are Brownfields. The budget for their cleanup has increased over the years to $87 million for FY97, and is expected to go up to $300 million over the next four years. The environmental agenda for the future needs to include the Minority Worker Training Program and Brownfields site remediations. Mr. Fields further
said that there is a lack of adequate technology essential to tackling clean-up issues; e.g., the chemical 'dioxin' has been removed from the environment at the cost of millions of dollars but the knowledge and technology to get rid of it does not exist.

In response to a question, Mr. Fields affirmed that it made good sense to train residents of the affected community to clean up the Brownfields site. He further explained that if training could be extended to residents who were on welfare, it would provide the additional benefit of enabling them to join the active workforce.

The NIEHS-Department of Energy (DOE) Partnership

Administered by NIEHS through an interagency agreement with DOE, this Worker Training Program was initially authorized for two years at a level of $10 million. Since then exact funding levels have been in dispute.

The Office of Environmental Management's (EM) policy at DOE is to "Do Work Safely or Don't Do It." The EM mission requires tackling one-of-a-kind hazardous operations across the DOE complex, such as high level radioactive waste management, special nuclear materials stabilization, deactivation, decontamination, decommissioning of contaminated buildings, and restoration of contaminated environments.

While addressing workshop attendees, Alvin Alm, Assistant Secretary for Environmental Management (EM) at DOE, expressed the view that "we are all responsible for safety and training is going to be necessary for all future activities involving remediation, health and safety, and hazardous disposal activities." His safety focus has four priority areas (Alvin Alm, Memorandum, Subject - Safety Management, January 22, 1997):

1. Worker involvement - Workers should be involved in all processes leading to performing work safely, such as Enhanced Work Planning, Work Smart Standards, Job Safety Analysis, etc. They must be involved in interdisciplinary teams to define and solve safety problems. Workers can be the most effective forces to enforce safe conditions if they are given the authority, responsibility, and the right incentives. All workers, including supervisors, need to take personal responsibility in order to prevent harm to themselves, others, and the environment. Appropriate training and information for all staff, contractors and others working with EM needs to be provided.

2. Management audits - Alm endorses the practice of "management audits" that DuPont has been conducting, and he expects all EM managers to engage in such walk throughs. DuPont believes that frequent management audits have contributed greatly to the success of their safety management program and their business. DuPont emphasizes the importance of frequent management walk throughs in addition to formal audits.

3. Establishing goals - EM will set goals to reduce accidents and exposures over a two and five year period with a long term goal of zero tolerance. The components of EM health and safety programs are:

C Excellence in Performance
C Zero tolerance for incidents
C Integrated safety management
4. Establishing metrics - The initial set of four EM safety indices have already been established, which are to be supplemented by others as time and testing prove their usefulness. They are:

- Lost Workday Case Rate (lagging)
- Total Recordable Case Rate (lagging)
- Procedural Violations/Deficiencies (leading)
- Corrective Action Status (behavioral)

Worker participation in identifying work activities, hazards, and potential remedial measures is considered a critical component of EM's health and safety program.

III. Partnership Panel Sessions

Plenary I: Panel on Superfund Cleanup

Moderator: John Moran, International Union of Operating Engineers (IUOE) Construction Workers at DOE, Oak Ridge

According to Vern McDougall of the United Brotherhood of Carpenters (UBC), by using "Best Practices" in terms of safety and health, successful partnerships have been built between companies and DOE. An example of such successful partnerships is DOE's Oak Ridge Reservation, Lockheed Martin, MK Ferguson, and the United Brotherhood of Carpenters. One of the reasons for their success is that they have allowed contractors to find new ways to operate. James Meredith, Training Director for MK Ferguson, felt that a key milestone that jelled the program was the "Partnership for Safety Agreement". The agreement was developed to stress and verify the commitment of MK Ferguson, the subcontractor community, and all site employees to conduct all operations in a safe manner. The "Partnership for Safety Agreement" stresses individual initiative, accountability, and ownership in the dedication to safety and health.

MK Ferguson employs 600 tradespersons and runs a successful partnership with DOE. The partnership has been in effect for 2 years, in which workers have been empowered to achieve in the areas of:

- Safety and health
- Reduced construction costs
- Improved performance
- Increased production

Two full-time trainers and one part-time trainer per craft, work on job-specific training. The benefit of this type of training is that the trainer can relate to trainees better, while allowing for "taking the training to the field and not the field to the training." MK Ferguson's partnership with the unions allows for the workers to serve on the training subcommittee, to make recommendations for a more cost effective program, and to help develop safety and health causes. The partnership is proud of its 2.5 million safe man-hours and all partners believe that trust, respect, and honesty are the foundation of a successful partnership.
Laborers-AGC’s National Training Market
The Laborers-AGC and Foster Wheeler Environmental Corporation, a major environmental restoration contractor, have had a training partnership in place for approximately four years. This partnership is part of an Environmental Partnering Project Agreement in which Foster Wheeler exclusively hires members of the Laborers-AGC, the International Brotherhood of Teamsters, and the International Union of Operating Engineers. Each union trains their own workers so that they are ready to be hired when Foster-Wheeler needs them. Foster Wheeler employs approximately 5,000 workers annually throughout the United States. Most of that work is a result of Total Environmental Restoration Contracts and Remedial Action Contracts let by the Department of Defense and run by the Army Corps of Engineers.

Without this partnership, Foster Wheeler would have to pay $1,000 per worker for HAZWOPER training alone. They would also have to pay for costs such as drug screening, and additional training courses such as asbestos abatement, lead abatement and radiation worker, totaling approximately $5,000 per person. Additionally, Foster Wheeler saves the cost of keeping workers employed full-time through the peaks and valleys of construction employment because workers can go back to the hiring halls and go to other jobs. They also do not have to incur the cost of retraining workers when they return to work.

The Laborers-AGC has learned the importance of screening candidates for basic HAZWOPER certification. Since beginning the partnership, the Laborers-AGC has learned to track their members’ mobility from job to job. By doing this, they know exactly who is certified in what, and where they are if a job needs to be filled. This benefits both the members and the companies that wish to employ them.

Plenary II: Panel on Hazardous Waste TSD and Collateral Duty Emergency Response, Industrial

Moderator: John Morawetz, International Chemical Workers Union

Workers Training Workers at Libbey Glass Plant

The International Chemical Workers Union Council Training Center (ICWUC-TC) and Libbey, Inc. (Toledo, Ohio plant) have formed a training partnership which provides equal involvement between Libbey and the ICWUC-TC. There are four local unions representing the workers at Libbey Inc.’s Toledo plant. They are the American Flint Glass Workers Union (AFGWU) Locals 700 and 65, the International Association of Machinists and Aerospace Workers (IAM&AW) Lodge 105, and the Glass Molders & Potters (GMP) Local 59.

Located in Toledo, Ohio, Libbey Glass Plant produces glassware, such as vases, glasses and the like. The Toledo plant employs approximately 1,000 employees.

Together, union representatives and company representatives agreed to train union members from the shop floor to conduct health and safety training for all workers at the plant, both hourly and salary. Sixteen workers were selected to be trainers. Both the union and the company agreed upon the criteria for selection. One very important consideration was insuring that all departments were represented so that workers would be training co-workers. This added credibility to the training.
A team of four (Bruce Mahan – Field Training Director, ICWU-TC; Don Dudley – President AFGWU Local 700; Rob Schroeder – Human Resource Manager, Libbey Inc.; and Shawn Zablocky – Industrial Hygienist, Libbey Inc.) met in Cincinnati at the ICWU-TC and laid the groundwork for the “train-the-trainer” class that was to be given to the sixteen members. They agreed on the four modules the trainers would deliver (Hazard Communication, Lockout/Tagout, Fire Extinguishers, and Personal Protective Equipment). They agreed on the objectives for each module and drafted materials and exercises for each.

In August 1996, Bruce Mahan and Don Dudley conducted the two-week “train-the-trainer” at the Libbey plant in Toledo. Throughout the two-week session, Rob Schroeder and Shawn Zablocky interacted with Bruce and Don insuring that it was truly a joint effort. Both the union and the company were in agreement that the objectives were being met. The two-week session was extremely interactive and the sixteen trainers had a great deal to do with the content of the final product.

“This is a unique and exciting project. The commitment and energy that the trainers brought to the sessions was contagious. They went above and beyond the call of duty. We are very proud to be a part of this effort.”*

“The uniqueness of the program is of great benefit to Libbey Glass. The extent to which the training is a joint program with union and management each having input on all aspects helps to break down previous barriers between the parties. What made the program so unique is how it was tailored to the plant’s needs on the topics that were chosen. I am very impressed with how union and management worked together to make the plant safer.”**

“Refresher training for the trainers has been schedule for every three months to insure that materials are kept current and training skills are kept sharp. To date, over a thousand workers have been trained through this program and the feedback has been overwhelmingly positive. The project is in its infancy and revisions are on-going. However, all parties involved feel that the joint training partnership has been a tremendous success.”***

UAB/CLEAR Training Program

The University of Alabama at Birmingham (UAB) is a Center for Labor Education and Research (CLEAR) Training Program which has developed a successful partnership with the American Forest and Paper Association and the United Paperworkers International Union (UPIU). The program goal is to train all the participant union employees to respond to emergencies and chemical spills, and to put into place a network of trainers that can do training in the local unions and workplaces. Train-the-trainer programs are estimated to effect 63,200 workers and include targeted efforts to reach women and minorities.

Over a five year period, UAB has proposed to conduct 145 courses to train workers as member-trainers for First Responder Awareness level training, as well as technical task training. Over the past four years, 10,000 members of the UPIU have been trained through the NIEHS Worker Training Program. Approximately two-thirds of them were trained in union/company partnership training by union member trainers at pulp, paper, and other industrial work places.

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2 Bruce Mahan.
3 Don Dudley.
The companies involved in the partnership have had a positive reaction to the partnerships. One of the main reasons attributed to the program’s success is the union-management relationship. Management is often invited to participate in the training by union members. The experience has improved labor relations and resulted in improved worker morale. Additional results of the training partnerships include: companies saving money by utilizing peer training; more workers receiving more extensive training of better quality; emergency incidents being resolved quickly and safely following UPIU member training; and emergency plans being written and upgraded by union members following training.

Historically, UPIU has been UAB’s key training partner. However, the program has expanded into a coalition involving the International Union of Electronic, Electrical, Technical, Salaried and Machine Workers (IUE); the Glass, Molders, Pottery, Plastics and Allied Workers International Union (GMP); and Johnson C. Smith University, a historic black university, in Charlotte, NC. Other organizations that participate in the partnerships include the UAB School of Public Health and the International Occupational Health Foundation.

To date, fifty-three managers, invited by UPIU members in their plants, have attended classes taught by UAB instructors. One hundred thirty companies have been represented by members and managers, and nine OSHA compliance officers have been invited to, and attended training classes. The peer training aspect of the partnership training program has saved companies approximately $1,000 per participant or $6,600,000 for the 6,600 employees trained by UPIU members.

The UPIU has seen a number of promotions of individual workers as a direct result of training. In some facilities, the safety record improvement can be credited, at least in part, to the joint training effort. Trained workers are writing emergency plans. Joint safety committees are tackling complex problems with clear goals and structured steps to achieve them. Labor and management are working together better than ever before in the paper industry, an improvement that is enhanced by joint training programs.
Plenary III: Panel on Emergency Response, Municipal

Moderator: Brad Sant, International Association of Fire Fighters

AFSCME and the City of Duluth Labor-Management Partnership

The city of Duluth, Minnesota and the American Federation of State, County, and Municipal Employees (AFSCME) have forged an effective emergency response partnership -- based on training, coordination, and trust.

Over the last several years, municipal employees of the departments responsible for water, sewers, roads, and public works have come to be regarded as an important part of emergency response planning and implementation. They are, in fact, collateral duty emergency responders and need to be trained as such. When there is a spill of a hazardous material that goes into the sewers, it is AFSCME members that face exposures to hazardous materials as they put in a sewer plug. When there is a hazardous material spill on a highway, it is AFSCME members that hose the highways and bring in sand and spreaders.

City of Duluth Loss Control Manager Robert Troolin provided many examples of the need for coordinated action. Mr. Troolin described an oil spill on a major road into town that occurred just before rush hour. The highway was domed, and so oil was not only all over the road, but was draining into the land on both sides of the highway. It was necessary to rapidly sand the road, so that cars would not slip and slide and drivers and vehicles would not be endangered. There was also a need to protect the environment from the run-off. Good training, good coordination, and a trusted partnership brought the situation under control.

An early example, which helped forge the partnership involved a benzene spill. Members of the Duluth Fire Department were one-third of the way through a hazardous materials training course, when a major benzene spill occurred. The city was sealed off and evacuated. One of the trainers, from the Midwest Center for Occupational Health and Safety, took charge as the on-site supervisor, while the Duluth Fire Department, with air monitoring training equipment from the training program, became the emergency response team. The training equipment was used to monitor the spill, and the partially-trained Duluth Fire Department was the emergency response team. As a result of this incident, officials of the city of Duluth decided to use the HAZMAT training program with employee units of the city's Department of Water and Gas.

According to AFSCME representative Bill Marquardt, municipal officials like those in Duluth appreciate the NIEHS-supported HAZMAT program, and that training might be impossible without government financial support. The introduction of these HAZMAT programs also provides various public and private sector officials with an introduction to the need for such other training programs as hazard communications.

Railway Workers Hazardous Materials Training Program

Plans for the first labor-management partnership in rail transportation began in 1994. The partners are the Transport Workers Union of America (TWU), the Transportation Communications International Union (TCU), Consolidated Rail Corporation (Conrail), and the George Meany Center for Labor Studies. The goal of the partnership is to use peer instructors to train rail workers who inspect and repair rail cars. The training addresses 1) OSHA rules for workers who must
recognize a hazardous materials release and begin the emergency response process and 2) the U.S. Department of Transportation rules for hazardous materials transportation.

Participants in this workshop plenary were Gary Maslanka, President, Local 2020, TWU; Harold French, Local Chairman, Local 6876, TCU; and Joe Carmean, Manager of Operating Assets, Conrail.

The partnership peer training program has a two-fold mission statement: 1) to provide employees with appropriate and effective training in hazardous materials transportation and emergency response as required by the Hazardous Materials Transportation Act and Occupational Safety and Health Act and 2) to provide employees with essential knowledge in the critical area of hazardous materials, and respect for the potential dangers, in a continuing effort to achieve the highest level of employee and public safety, and environmental protection. This second part of the mission is the one that distinguishes it from the majority of hazardous materials training programs, especially in the rail industry. Ten goals were also established for the training program. These goals benefit Conrail, as well as workers and the public.

Before training could begin, there were some workplace environment issues which needed to be resolved. These included: 1) work force staffing limitations; 2) pressures to increase production as a result of competition with other railroads and other transportation modes; 3) introduction of employee involvement as peer instructors (because it was a relatively new concept to railroad mechanical workers); and 4) considerations in peer instructor selection.

Work Force Staffing Limitations. The concern was how to keep the trains moving when workers are teaching classes or attending a training session. To alleviate this concern, the following steps were taken: 1) proper planning, with sufficient advance notice and communication with local and division management; 2) appropriate scheduling designed to avoid operational disruptions including a) scheduling classes during all three shifts, b) making training available to workers off shift, and rest days; and c) limiting participants, when necessary, and rescheduling on different dates.

Pressures to increase production due to competition with other railroads and other modes of transportation. The primary concern was that the need for increased productivity and on-time train performance would be overlooked as cars with safety issues appeared. To ensure that productivity and scheduling were not sacrificed, the train-the-trainer session emphasized being professional, responsible, and using sound judgment, as well as the point that training should result in increased productivity and on-time train performance. Workers who are properly trained understand how to handle such situations that result in briefer if any delays and cost avoidance.

Introduction of Worker Involvement, peer instructors - a concept relatively new to railroad workers. The initial response to the "call" for peer trainers was "Why is the union involved in this training? It is management's responsibility." To change workers' attitudes it was emphasized that the union's involvement was designed to: 1) ensure effective training; 2) consider worker concerns; 3) use worker expertise and experience; 4) ensure workers' awareness of hazards and potential dangers; and 5) ensure workers' knowledge in applicable rules and regulations.

Peer Instructor Selection Process. For this process, it was important to avoid complete management control and to avoid personality conflicts. In order to do this they developed a process that considers worker background, abilities, interest, and peer instructor requirements.
Second, the process was supported with a requirement for local union and management consensus in the selection. Other qualifications examined included: HAZMAT background (fire fighter), safety training background, desire to participate, and communication skills.

During 1994 and 1995, thirty-three railway workers, through two separate training sessions, became peer trainers. These thirty-three trainers, in turn, in eighteen months, formally provided over 800 railway workers in 17 cities, in eight states, with hazardous materials awareness training. Management either participated in or observed instructor training and worker training. Informally, in that most of these trainers work daily in rail yards and shops, many other workers who are not fortunate enough to go through the formal training get exposure to the knowledge of their peers.

After the first instructor training class in December 1994, a program development sub-team, comprised of six carmen, was established. The group spent three months developing materials and procedures for Department of Transportation-required training. The sub-team trained with the new materials for two days before the first worker training course, in order to introduce the materials to the other peer trainers as well as to review materials for accuracy and effectiveness. Before worker training begins in a new location, sub-team and Center representatives provide further training for peer instructors. The sub-team, with some assistance from the Meany Center staff, developed the Trainer Support Manual, Hazardous Materials Training for Mechanical Department Employees: Trainer Manual and HAZMAT Training for Mechanical Department: Student Manual, as well as visual aids. Each class, is taught by at least two of the 33 peer trainers. Typically, one of the trainers is an on-site worker and one is brought in from another location.

Joe Carmean, Manager of Operating Assets, Conrail, said at the workshop that “the peer trainers really own the training - they put it together and that's a real plus.” According to Carmean, the peer trainers really made believers of the people at Conrail.

The Railway Hazardous Materials Partnership plans to continue and expand training, institutionalize the program, and sell the program to Conrail’s proposed merger partner.
Plenary IV: Panel on Small Business Partnerships

Moderator: Chip Hughes, NIEHS

Small Business in the Department of Defense (DOD)

Ash Sudhakar, President, Sudhakar Company Inc., operates an 8-A environmental construction company and felt that the most important component of the bid is the labor. It is essential to have a competent and qualified workforce, with trained and competent workers. His priorities are to do the job competitively, safely, and on time. He is presently working with the Laborers-AGC to develop a training program and considers trust, honesty, and respect essential for successful partnerships.

A Pre-Apprenticeship Project

This panel on successful partnerships involving small business consisted of Mark Deathridge, President, East Tennessee Mechanical Contractors, Inc.; Dan Maples, President, Knoxville Building Trades Council; and Vern McDougall, United Brotherhood of Carpenters (UBC) Health and Safety Fund.

The Pre-Apprenticeship Carpentry Program which was developed in east Tennessee was the result of years of discussion with Dan Maples on the need to have more qualified minorities and females represented in the Knoxville labor force. In June 1996, a meeting was held with a representative of the United Brotherhood of Carpenters Health and Safety Fund for Environmental Justice (Kizetta Vaughn); two representatives of the Knoxville United Brotherhood of Carpenters; and several representatives of the East Tennessee Mechanical Contractors staff. At this meeting, the parties decided to conduct an eight-week pilot program in Pre-Apprenticeship Carpentry for 15 students.

In just the first week after agreeing to implement this program, the partners: delineated responsibilities; prepared a training proposal; prepared and distributed marketing and recruitment information; identified a staff including instructors for carpentry, remedial and related education, first aid, and CPR; prepared the space; and identify materials to be used. During week two recruiting continued and applicants were screened. Several realistic questions and training/job expectations were used as a “measuring stick” for potential performance.

During the third planning week sixty-eight applicants were interviewed. Orientation and related education were scheduled to begin on July 8, 1996. By July 11, 1996, fifteen trainees had committed to participate in the program.

East Tennessee Mechanical Contractors, Inc. committed to recruiting and screening low-income, minority trainees for the pre-apprenticeship program in Knoxville. They determined math and reading levels of trainees and provided needed remedial training, GED training, Life Skills training, job counseling, and other support services. They also provided hazardous waste employment for trainees at Oak Ridge upon completion of the training. In addition, they provided materials for the program and $100 per week stipends for the trainees.

During orientation and related education (weeks one and two of actual training) such issues as child care, transportation, physical fitness, food, shelter, family roles, and basic math skills were discussed. Week three consisted of hazardous waste worker training. Weeks four through eight,
included principles of the carpentry trade and safety on the job.

The results of the training are as follows:

Eleven males and 4 females were recruited for the pre-apprenticeship carpentry training. Of these, 2 people were homeless, only 5 had cars available to them, and there were 15 dependent children among them.

Eleven trainees were certified in First Aid and CPR, 9 were certified in Hazardous Waste Worker Training.

Ten of the original fifteen completed the program, 7 males and three females.

All ten joined Carpenter Local 50.

Five apprentices have worked on union jobs ranging from 1 day to 6 weeks, and four apprentices are currently working in non-union jobs.

**DePaul University-Webb Tools Small Business Partnership**

Webb Tools, Inc., a company that builds computer cases, had just been inspected by OSHA and cited for 35 violations totaling $41,400. The company had no human resources (HR) department, let alone an HR manager. No safety programs or training programs had ever been implemented for its 200 employees, seventy percent of whom spoke only Polish or Spanish.

OSHA directed the company to train all employees in Hazard Communication in eight weeks. Webb Tools quickly hired Carol Jacklin, an HR Manager, who had previous experience working with DePaul University as a training provider. DePaul was able to work with Webb Tools to get the Hazard Communication training done, and more. The OSHA inspection, and subsequent training jump-started systemic cultural changes. A safety committee was established; there was increased awareness of safety; other training programs were instituted; workers took ownership of the PPE program and Webb Tools' in-house training capacity was improved through a train-the-trainer program offered by DePaul.

The partnership was not just between Webb Tools and DePaul, but also with OSHA. When OSHA saw the quality of the training program, the tone of its relationship with Webb Tools changed. After seeing everything that Webb Tools had done to remedy its violations, OSHA reduced the penalties from $41,400 to $19,500.

Webb Tools felt that the training partnership with DePaul worked because DePaul was able to customize curricula in English as a Second Language, basic math, and SPC, with team skills and cognitive enrichment. The training provided by DePaul is learner and client centered. Also important, especially considering the time frame within which they had to work, was that DePaul was fast, focused, friendly, and flexible.

**IV. Discussion/Recommendations from Breakout Groups**

**Breakout Session 1: Curriculum and Training Methods**
Moderators: Audrey Gotsch and Mitch Rosen, New York/New Jersey Consortium

Issues addressed in the session:

1) How to modify curricula for site specific training;
2) How to adopt requirements to meet the needs of the target population;
3) What modules are being used for 8-hour refresher training;
4) What is required in the 24-hour course for the occasional worker at a hazardous waste site;
5) What modules could be used to meet the requirements of several training courses;
6) What are the obstacles to overcome in developing partnerships in training; and
7) What leads to the development of successful training partnerships.

The discussion focused heavily on participants’ experiences in training at the Hanford DOE site. The ability to integrate site specific training into the basic course at the DOE complex started off the discussion. This was an issue for not only the 40-hour course, but also for the refresher. [The consensus was that site specific training is not happening per the regulations and that it would be impossible to fully incorporate because of the range and mix of hazards which workers must deal with on a site by site basis.] Various ways of dealing with this issue were presented. One awardee uses group interactive methods and hands-on activities in its training, recognizing the need to be creative in addressing the issue. Another awardee uses a system of modularized curricula, calling and interviewing site personnel to get some idea of the nature of the site specific hazards.

People at HAMMER (Hanford’s training facility) recommended involving trainees in job safety analysis, as opposed to having them involved in the development of a site safety plan. HAMMER staff recommended using site specific MSDSs in class.

Various cases were identified in which partnerships helped with site specific issues. In one case, an awardee’s partner went out on its site and videotaped work in progress. The tapes were then given to the trainer and used as a trigger for questions and discussion. This method evoked positive feedback from students. Some suggested having site health and safety personnel come in and discuss lessons learned. At Hanford, health and safety professionals are involved throughout the training process.

There was a suggestion made, and most agreed, of the need for a workshop dedicated solely to 8-hour course issues. The refresher must be: participatory and problem solving; vary from year to year to maintain student interest and involvement; bring out trainee experiences; and have workers present materials and participate in team building.

Obstacles to developing partnerships have included: lack of trust between labor and management; curricula development; finding the right forum for communication and exchange; convincing management that training is cost effective; finding a setting for the actual training facilities; and not involving the stakeholders in course development and delivery.

The group felt that what leads to the development of successful partnerships is: 1) motivated instructors and fresh course materials, 2) giveaways (tee-shirts, caps etc.) that motivate the participants, 3) respect of partners for stakeholders, 4) commitment and support of management,
5) expertise with target population, 6) participatory problem solving, 7) exchange of training materials, and 8) emphasis on win-win nature.

Breakout Session 2: Criteria for Training Programs

Moderator: Mike Merrill, Rutgers University and OCAW

Participants focused on two questions: What are the criteria for successful training programs? and What are the criteria for successful training partnerships? The group spent its time generating a list in response to each of these questions.

Each criteria was then deemed either an outcome or an element of the training program. An (o) or an (e) following the criteria depicts this.

Criteria for Successful Training Programs

Criteria for Successful Training Programs

1. Management commitment [e]
2. Cost effective delivery (operational) [e]
3. Documented program that clearly meets requirements (what you do, how you do it) [e]
4. Program that exceeds requirements [e]
5. Meet diverse needs [e]
6. Needs assessment is integral [e]
7. Client driven program [e]
8. Continuity with other programs [e]
9. Self assessment process of instruction, clients, students (How are you going to improve) [e]
10. Provision for follow-up after training [e]
11. Hands-on components [e]
12. Mixed training methods [e]
13. Easy to Upgrade [e]
14. Skilled, competent instructors [e]
15. Reputation - how well do others view the program [e]
16. Worker involvement [e]
17. Worker empowerment [e and o]
18. Interesting and immediately useful [e and o]
19. Measures of effectiveness [e and o]
20. Reduces injuries and illnesses [o]
21. Improved hazard recognition skills [o]
22. Strategies for getting problems fixed [o]
23. Continued management support [o]

The following words were chosen to sum up criteria for a successful training program: inexpensive, effective, and measurable.

Criteria for Successful Partnerships

Criteria for Successful Partnerships

1. A good training program
2. Each partner gets what it wants
3. Agreement up front (objectives, roles, responsibilities)
4. Full partner participation
5. Mutual respect, honesty, trust (and a little leverage)
6. Process to resolve differences (conflict resolution)
7. Not too many partners
8. Customization (good training assessment)
9. Partner compatibility
10. Necessity, driving force, leverage
11. The key decision-makers must be in it
12. Good lines of communication
13. Clearly assigned responsibilities (ownership)
14. Don't promise what you can't deliver
15. Priorities have to be in line - at least some overlap

Again, the group chose a few words to sum up the list: resources, commitment, and a clear understanding (communication).

During the introductions, Jim Meredith, a major user of the NIEHS training program through MK Ferguson's partnership with the United Brotherhood of Carpenters, expressed his appreciation for the NIEHS program: “Sure hope you guys keep getting those grants because we could sure use them.”

Erik Erichsen said of Hanford: “HAMMER’s success is partnerships.”

Breakout Group 3: New Technologies

Moderator: John Moran, International Union of Operating Engineers

The session proceeded with review of some highlights of the past two 1995 workshops on the new technology issue. The first workshop framed the issues and the second one further developed those issues. There are two primary issues for new technologies to address:

* Technology safety data sheets (TSDSs)
* Emergency response preparedness

A 1995 Office of Technology Assessment (OTA) report indicated that 12 major federal agencies, in 1994, had invested $3.5 billion for the development of new technologies, including the Department of Energy (DOE), Department of Defense (DOD), and the Environmental Protection Agency (EPA). Out of this, $1.5 billion has been assigned for remediation technology. DOE wants to accept, certify or credit new technologies before they get deployed -- but no clear criteria exist for the purpose of certification. EPA and the State of California have developed a pilot program for certifying remediation technologies at the state level. This type of certification is based only on “efficacy”, without any assessment of safety and health or emergency response issues associated with the use of the technology, i.e. human health and safety factors have not been considered.

New technologies in hazardous waste remediation processes can be classified as:

Type I Technology – New equipment and processes. For example, the biggest breakthrough in respiratory protection since 1975 involves the use of:
a. Liquid air for respiration  
b. A fully encapsulated suit without a headpiece  
c. Generation of liquid air out in the field

DOD developed the liquid air respirator in Massachusetts. In Houston, Oceaneering Space Systems (ILC Dober) developed a liquid air respirator and added long johns with cooling waterhoses to the suit. Devices and equipment like these represent a new generation of personal protective equipment.

Type II Technology - Established technologies used in environmental remediation.

Type III Technology - Robotics and other cutting-edge technologies designed for narrow and specific windows of application.

What is essential at the moment is to find an appropriate way to integrate new technology training methods into training programs. Technology-specific training modules will have to be developed. Also, differences between sites, even those that use the same technology for remediation, create the need for site specific application of technology. In addition to technology-specific training, site-specific training should prove to be a valuable tool.

According to Fritz Kin of OHM Remediation, a major environmental remediation firm, the chief safety hazards are encountered by workers during set-up or tear-down of the new technology equipment. The 40-hour core health and safety training serves only as the foundation for the hazardous waste operations training. Forty hours does not represent an adequate amount of time to incorporate new technology training methods as well. An additional 40-hour site-specific training that covers technology and equipment (e.g. hoses, filters etc.) should also be provided, beyond the basic 40-hour training.

For new technology, it is important to do a "task analysis" or a Safety Analysis Review (SAR). State regulations and Standard Industrial Codes (SIC) and their relationship to Hazardous Waste Operations (HAZWOPER) work should also be reviewed.

Another issue in the discussion was whether training would be more effective if the developer of the technology provided the training to workers instead of the contractor. It was agreed that the developer might not be suitable or better equipped to provide training and that it should be the responsibility of the contractor to train workers. At the contract stage, proper funding for the training should be provided, since the contractor will not train workers unless the training is paid for.

Another alternative is for agencies, trade associations, or joint labor-management lobbying to push for the use of model contract language, which will require the contractor to provide the training. A community that is educated and aware of safety issues can also demand that the contractor provide training. Additionally, if Workers’ Compensation is aware of the situation, they can put pressure on the contractors to train their workers. A benefit to the contractor would be lower insurance rates since the workers will be receiving adequate training.

The basic challenge lies in dealing with training issues associated with new technology. There was a general consensus among the breakout participants on the following issues:

* New technology training cannot be covered in the basic 40 hour training and requires an additional 40 hours to achieve its goal.
* The trainees need to be acquainted with the basic technologies before they can go on to train for the new ones.

* Technology specific training needs to be developed. The technology also needs to be site specific in order to be applied to different sites.

* Site specific safety and health plans will have to be developed.

* Training needs to emphasize maintenance, set up, tear down, and operations.

* Anticipated hazard should be integrated into the TSDS. A TSDS and SAR should be required in the earlier stages of the development of technology, and in addition, the TSDS should be modified at each stage of the development.

* The developer of the new technology needs to keep in mind the health and safety hazards associated with the technology, during the process of its development, in order to eliminate or reduce the hazards.

* The criteria for review of the health and safety implications of the technology should be defined before development of the technology is begun. The technology should fulfill the safety criteria before any money can be awarded to the developer. However, in most cases, anticipation of all possible hazards before implementation of new technology is not feasible.

* The ideal person to provide the training would be the contractor and not the developer of technology.
In conclusion, the participants suggested that new technology issues can be helped along further by collaboration between organizations like EPA, OSHA, DOD, and DOE. The contractors need to be made aware of the important information surrounding new technology and training. The National Safety Council has formed a new technology network in order to disseminate information concerning new technologies and organizations of a similar nature like the AIHA, NIDA, and ASSE etc. should work similarly.
Dr. Robert Bullard, of Clark Atlanta University, opened the Minority Worker Training Issues breakout session by setting the scene for participants to share ideas and experiences after one full year of conducting the seven Minority Worker Training Programs. Each participant gave a brief presentation of their program that included major successes, obstacles, solutions, and future plans.

Several common themes ran across the programs:

1. Hands-on attention to recruits mentoring. (Counseling of participants)
2. The need for careful recruitment and student screening. Use of the Test of Adult Basic Education (TABES).
3. The need for stipends.
4. The need for a strong academic/life skills component.
5. Establishing relationships with contractors and union locals.
6. Dismissal of students and discipline enforcement (rules of conduct).
7. College campus training in which trainees benefit from relationships with college students.
8. Participant mix is important. Include friends, relatives, and associates (team).
9. Pay attention to the culture of the construction industry (cultural diversity).

Also discussed were various obstacles and the way in which they can be overcome, based on the experience of participants.
OBSTACLE

HOW TO OVERCOME THE OBSTACLE

*Retention*
Method, better screening, counseling, stipends, mentoring, Communication

Relationship with Union Locals
Early communication with union locals
Include local union reps on advisory committee

Increase communication among stakeholders

*Placement*
Hire Job Developer/Coordinator
Having contractors on advisory committee

Work with local owners/awarding bodies to create incentives for contractors to hire students
Sign project agreements.
Time training cycles with construction work cycles.
Market graduates in the program

*Transportation*
Items to work on
Buy/lease/rent a van

Classes on buying a car
Team building using the buddy system - car pooling
Providing economic incentives
Encourage use of public transportation - fields trips
Tracking of Students

*Team Building*
Require participants to report hours
Pay students for attending post training meetings
Conduct worksite evaluations
Continue job placement assistance
Use voice message system

*Selling Funding Agencies on the High Cost of Training*
Explain the difference on DOL system of figuring cost for JTPA vs. WTP

Leveraging funds and staff from other programs
Educate Mass Media to promote the MWTP (use of local radio stations)
Put out flyers on program successes
Link MWTP to Brownfields

V. Workshop Summary
Glenn Paulson, one of the members of the NIEHS External Review Panel and President of Paulson and Cooper, Inc. made the following suggestions at the end of the workshop.

The work the NIEHS worker training program is important and beneficial and it should be made known to a wide audience.

NIEHS should create a map that depicts each of the case studies in their location.

The story presented by Mark Deathridge of the East Tennessee Mechanical Contractors and the Carpenters should be presented across the DOE complex. Likewise, the UAB/Paperworkers should also be presented in various locations.

More success stories should be put on the Internet and in the Clearinghouse Newsbrief.

There should be studies of the economic effectiveness of the NIEHS training program.

Participants were eager to both spread the word on what had worked for them, as well as learn from others about new partners, and new, more effective ways of forming partnerships. Many more similarities than expected were found between the various partnerships. Mr. Paulson suggested that NIEHS periodically convene additional workshops or small conferences with this same partnership theme.