

1998/99 Annual Compendium of Articles and Research

Associated with

The National Institute of Environmental Health Sciences'

Worker Education and Training Program

Compiled by

The National Clearinghouse for Worker Safety and Health Training
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Introduction

Included in this compendium are articles and reports by those associated with the National Institute of Environmental Health Sciences' (NIEHS) Worker Education and Training Program. The articles discuss issues important to hazardous materials training and the safety and health of workers.

The 1986 Superfund Amendments and Reauthorization Act of 1986 (SARA) authorized a program of grants for health and safety training for workers involved with hazardous materials and waste removal, containment, and emergency response. NIEHS was assigned responsibility for administering the program and making awards to non-profit organizations with demonstrated experience and ability in reaching target populations and operating worker health and safety programs. The Department of Energy also has a cooperative agreement with NIEHS to make training awards. In addition, Congress appropriated additional money for a Minority Worker Training Program. This appropriation established a series of national pilot programs to test a range of strategies for the recruitment and training of young persons who live near hazardous waste sites or in communities at risk of exposure to contaminated properties for work in the environmental field.

Since the NIEHS Worker Education and Training Program began in 1986, more than 100 organizations from across the country have trained workers to better protect themselves, their colleagues, and the communities in which they work from the dangers of hazardous materials. As a result of these programs, trained employees work more effectively at their job sites to promote safer processes and procedures. Twenty awardee groups and consortia, representing labor-management, labor, and academia, have developed model curricula and delivered training to more than half a million workers.

EDITORIAL FOR THE JOURNAL OF THE FRANKLIN INSTITUTE

The Case for Integrating Safety and Health into the Design of Innovative Environmental Remediation Technology

John Moran and Bruce Lippy
International Union of Operating Engineers
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Beckley, West Virginia

INTRODUCTION

Through the Manhattan Project, the U.S. was able to design and build an atomic bomb in less than 4 years at a cost of approximately \$2 billion dollars (OTA 1993). The nuclear weapons complex grew over the years into a complex of more than 120 million ft² (11 Mm²) of buildings and 2.3 million acres (92 000 km²) of land - an area larger than Delaware, Rhode Island, and the District of Columbia combined. The Department of Energy (DOE) is the agency responsible for this enormous complex and for cleaning up the environmental contamination that occurred during our arms race with the Soviets - what the agency refers to as the "Cold War Mortgage." DOE has recently estimated the mortgage costs to be \$230 billion over the next 75 years. This estimate could increase to \$350 billion if the country decides that more pristine standards of cleanup are required (DOE 1995).

This cost is only for the sites controlled by the DOE; the Department of Defense (DOD) has identified 10 000 contaminated sites at over 800 bases nationwide and spends \$2.1 billion annually for environmental restoration. The DOD spends another \$2 billion annually on operations and maintenance related to pollution prevention and \$170 million on environmental research and development each year (SSEB 1997).

THE IMPORTANCE OF INNOVATIVE REMEDIATION TECHNOLOGIES

The Comprehensive Environmental Restoration Compensation and Liability Act (CERCLA), also known as Superfund, set an important precedent by requiring a formal Record of Decision (ROD) for each remediation project, including a systematic evaluation of the technologies available for accomplishing the cleanup and a written explanation of the final choice. U.S. Environmental Protection Agency (EPA) required that innovative technologies be considered as part of this formal evaluation and provided funding through its Superfund Innovative Technology Evaluation (SITE) program to test the efficacy of these technologies at cleaning up soils, ground water, and contaminated equipment. New environmental technologies hold great promise for cleaning up our hazardous wastes sites more quickly, at lower costs, and with less exposure to the workers.

The DOE recently screened more than 100 potential technologies scheduled to be implemented by the year 2000 for applicability to high-cost remediation projects. The

DOE found that the 15 technologies with the greatest impact could result in cost savings from \$9 to \$80 billion, depending on future land use strategies and assuming the technologies could be implemented by 2010 (DOE 1995). New technologies can make a real difference. Unfortunately, their impact will be zero if they aren't deployed. A preliminary evaluation of 39 RODs by the DOE indicated that innovative technologies were incorporated into only 9 (23%), despite a directive to consider innovative and emerging technologies in primary documents (DOE 1994).

There are serious impediments to the use of innovative technologies. State environmental regulators continue to rely on conventional solutions for many reasons including governmental inertia toward change and because their technical training budgets are always underfunded, limiting comfort with new technologies. They fear the liability, too, of innovative technologies that don't do the job. Remediators have been slow to propose innovative technologies because of the costly and onerous demonstration projects each state requires, regardless of the successes in other states (Unger 1998).

Although Superfund has required consideration of innovative technologies, it has also been one of the impediments because of the rigidity of its requirements. Too often the ROD for a cleanup project reflects the choice of one of the standard technologies, generally requiring active engineering solutions, often with questionable results. This is changing, however. As William Reilly, Former EPA Administrator, said in October 1996, "Going into the year 2000, a great many Records of Decision will be renegotiated due to advances in technology, new understandings about site and contaminant risk and legislative changes. This will involve billions of dollars" (Paterson 1998). Another important consideration - the theme of the EPA's Brownfields Conference in September 1996 - is that the greatest impact from accelerating site remediation is not just the cost savings, but more so the economic gain from placing a property or facility back into productive use.

DYNAMIC CHANGES IN THE TECHNOLOGY APPROVAL PROCESS

The last decade of site investigations and remediation has afforded a much clearer understanding of the mechanics of cleanup. More realistic models are available to predict the extent of contamination and the most effective cleanup methods (Unger 1998). Coupled with this improved technical understanding are major political shifts in the approach to regulating the use of new remediation technologies. One of the most important causes is an increased acceptability of the EPA proposed Risk-Based Corrective Actions (RBCA). Using risk rather than a legal prescription to determine the scope of the response has been advocated by many groups previously, including the Institute for Regulatory Science and the National Research Council. The American Society for Testing and Materials (ASTM) has developed a procedure for setting cleanup requirements based on reducing risk rather than meeting a generic standard (ASTM 1994).

Of even greater significance is the trend towards multi-state alliances. More than half of the states have joined in various working groups to establish minimum technical

requirements, demonstration protocols, permit protocols, and technology-specific resource documents to streamline the technology acceptance process. Six states, that include nearly a third of the environmental market, are attempting to establish reciprocity for environmental permits, using twelve technologies to pilot their studies (Unger 1998). They have divided the conventional permitting process into four key segments: 1) technology demonstration; 2) technology acceptance; 3) developing permit operating conditions; and 4) administrative procedures for making a decision.

A critical finding of this group was that the first two categories require approximately 90% of the time for the entire permitting process. When the regulators are comfortable with the technology, defining the local operating conditions for the permit is a relatively simple task. Consequently, the multi-state efforts are particularly critical.

Regulators from 27 states have been voluntarily cooperating since 1995 in the Interstate Technology and Regulatory Committee, which has been working to share information and streamline the technology approval process. Similarly, the Southern States Energy Board has created the Permitting Leadership in the United States (PLUS) initiative as a means to overcome regulatory barriers to expedite technology deployment on a state and regional basis. On September 1996, the Southern States Energy Board unanimously approved a policy position on the "Expedited Multi-Site Deployment of Environmental Technologies", which serves as a template for states to assess change to legislative policy and regulatory programs (Nemeth 1998).

THE MISSING ELEMENT: WORKER PROTECTION

Amidst the change, one thing has remained constant: insufficient consideration has been given to the safety of the workers who must operate and maintain these new technologies. This is a trend with a long historical precedent. Superfund was promulgated in 1980 but Occupational Safety and Health Administration (OSHA 1989) did not create a standard for the protection of the workers who were handling the toxic wastes until 1989 (Herr 1998). This is not coincidence but reflects the setting of national priorities. The EPA's annual budget has averaged over 22 times OSHA's annual budget. For the present fiscal year, OSHA's budget is for \$336 million while the EPA budget is for \$7.36 billion (Herr 1998).

A recent study of occupational injury and illness looked carefully at 1992 data and estimated that there were 6529 workplace fatalities, over 6 million disabling injuries, and 862 000 new cases of occupational disease. The direct and indirect costs of the injuries and fatalities totaled \$145.4 billion, while the estimated costs of the occupational diseases came to \$25.5 billion. The researchers indicated this is undoubtedly an underestimation and concluded that the medical costs of occupational injuries and illnesses were much larger than the costs for AIDS or for Alzheimer's disease and are of the same magnitude as the costs for cancer or all circulatory diseases (Leigh et al. 1997). While this carnage continues in our workplaces year after year, only one person has been jailed for violating the Occupational Safety and Health Act since its creation in 1970 and the sentence was for six months. In contrast, hundreds of people have been jailed for violating EPA standards –

seven people have received 1-year jail sentences for harassing a wild burro on federal land (Herr 1998).

The choice of cleanup technologies has always been driven by efficacy considerations. The choice of technologies directly affects risk to workers, however. The National Safety Council found the total estimated death rate for occupations involved in the “excavation and landfill” remediation method could be 19 % higher than for the “capping” method (Hoskins et al. 1994). New technologies have claimed the life of at least one worker. The individual died of severe burns after a drum exploded in the feed chamber of a plasma hearth furnace. There have been several other accidents, as well.

There have been well over 150 different technologies evaluated through the EPA SITE program and many more are listed in the Remediation Technologies Screening Matrix and Reference Guide published through a collaboration between the EPA and Air Force. Databases including the Hazardous Waste Superfund Database, the Vendor Information System for Innovative Treatment Technologies (VISITT), and the Risk Reduction Engineering Laboratory (RREL) treatability database are available to help decision makers choose the appropriate technology. None of the aforementioned databases contain substantive information about the health and safety risks of the technologies.

Even an organization as prestigious as the National Research Council (NRC, 1997) has recommended to the DOE's Office of Science and Technology that worker health and safety should not be considered as part of a formal peer review of remediation technologies:

"OST's general list of review criteria includes broad issues such as cost effectiveness, reduced risk, regulatory acceptability and public acceptance, which include many nontechnical considerations... The committee therefore recommends that OST revise these general nontechnical criteria to focus on technical aspect of these issues, or to remove them from the list of review criteria."

Ironically, the OSHA Hazardous Waste standard has been a source of problems with new technologies. Section (o) *New technology programs* requires the employer “to develop and implement procedures for the introduction of effective new technologies and equipment developed for the improved protection of employees working with hazardous waste clean-up operations.” This is undoubtedly the most ignored section of this highly publicized standard. OSHA has never cited any employer for not introducing new technologies. Rather than fostering proactive approaches, the standard has resulted in safety being considered at the very end of the development continuum. The safety and health officer required to be onsite at a hazardous waste site by OSHA has become the de facto source of safety considerations for new technologies. Developers and government agencies, when pressed about the safety precautions taken with new technologies, have repeatedly stressed that there is a site safety professional who will oversee the operation and train the workers when the technology arrives at the site.

The OSHA standard puts such strong emphasis on the writing of a Health and Safety Plan that this effort has eclipsed the far more appropriate action of performing a system safety analysis of new technologies, a keystone to the Process Safety Management standard. Consequently, by the time the technologies reach the field, serious design flaws that should have been caught early are passed on to the site safety officer who must do the best he or she can to keep the flaw from hurting or killing workers. Often, this requires encumbering workers with additional personal protective equipment such as hearing protectors or respirators.

New technologies can benefit from old approaches. Developers should be using time-proven tools of system safety analysis, such as Hazard and Operability studies (HAZOP) and Failure Mode and Effects Analysis (FMEA) to identify and correct the safety problems with their technologies - as early as possible in the development timeline. It saves lives but it also saves money. One study showed that every dollar spent on design review saved \$20 (Ferry 1990).

EFFORTS OF THE INTERNATIONAL ENVIRONMENTAL TECHNOLOGY AND TRAINING CENTER

The Operating Engineers National Hazmat Program, through a cooperative agreement with the DOE's Federal Technology Center, has created a center to fill in this missing information on innovative environmental remediation technologies. The Center is located beside the National Mine Health and Safety Academy in Beckley, WV.

The Center's main mission is to conduct formal safety and health evaluations of technologies chosen by DOE as sufficiently effective and robust to provide real service to DOE and, potentially, the commercial market. These formal evaluations are conducted working with the developer using a team of experts chosen specifically for the technology. Industrial hygiene and ergonomic measurements are routinely made. The Center classifies technologies into three types to better frame the evaluations:

1. Type I technologies are innovations in worker protection such like a liquid-air breathing apparatus that provides cooling as well as breathing air.
2. Type II are the environmental remediation technologies, ranging from floor blasting devices to entire plants built to vitrify radioactive wastes.
3. Type III are robotic technologies, such as the robot that crawls down a pipe removing asbestos. Robotic units pose unique hazards. Most have computer software that replaces mechanical interlocks found in standard industrial equipment.

A comprehensive protocol has been created by the Center for evaluating each type of technology. The Type II protocol, for instance, contains 20 checklists for use on a broad range of environmental remediation technologies (IETTC 1997a). To date 27 technologies have been evaluated. Some of the findings are:

1. The innovative liquid air breathing apparatus was significantly better than a conventional self-contained breathing apparatus for lower back stress, as determined with digitized videotape used in a computer model called Watbak.
2. The noise levels were extremely high for nearly all of the technologies that remove the upper surface of contaminated floors and painted metal structures, with an average level of 182% of OSHA's allowable dose for an 8-h day for a sampling period of less than half of a workday. The results of measurements taken outdoors varied widely, with a coefficient of variation of 152.5% for 37 readings. When the technologies were used to remove surfaces from metal, the values were usually in excess of 10 fold of OSHA's allowable dose, again measured outdoors.
3. From 37 nuisance dust samples collected during concrete surface removal tests of 12 technologies, the average result was 375 mg/m³, compared against the OSHA standard of 15 mg/m³ (OSHA 1997). The results varied widely depending on the technology producing a coefficient of variation of 206 %. These tests were conducted on surfaces that were not contaminated but the technologies are designed to cleanup concrete contaminated with toxic chemicals and radioactive materials.

Recognizing the need to provide guidance for operators of robots, in cooperation with the National Institute of Standards and Technology and the Association for Robotics in Hazardous Environments, a workshop was held to draft guidelines for minimum personnel qualifications for operating robotic systems in hazardous environments. The guidance document, (IETTC 1997b) provides information on appropriate qualifications and training for operators of robots.

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SOUTHWEST WORKPLACE TOXICS TRAINING PROJECT

A partnership between

the Southwest Network for Environmental and Economic Justice

and The Labor Occupational Health Program at UC Berkeley

EVALUATION REPORT

July 1997

EXECUTIVE SUMMARY

Project Description

In 1996, the Southwest Network for Environmental and Economic Justice (the Network) and the Labor Occupational Health Program (LOHP) at UC Berkeley received a Community-University Partnership (CUP) grant from the Environmental Protection Agency. The Network and LOHP partnered in the development of a training program, with the goal of enabling environmental justice activists in the Southwest to train their communities on issues of occupational and environmental health and safety. By doing training and outreach on health and safety, these activists were able to expand their efforts to address local environmental and occupational health concerns. LOHP and the Network had begun this joint work in 1995, when they developed a workplace health and safety training which was funded by the National Institute for Environmental Health Sciences (NIEHS). In 1996, LOHP and the Network developed two more “train the trainer” (TOT) workshops and provided ongoing technical assistance and support to the participating organizations.

Twelve organizations affiliated with the Network and that are from California, Arizona, New Mexico, Texas and Mexico participated in the three TOTs conducted by LOHP. The TOTs were given in four languages: English, Spanish, Korean and Chinese. In between the TOTs, LOHP and the Network worked with the organizations to set up a community-based health and safety program through the volunteer trainers. Each team of trainers from each organization was responsible for carrying out two shorter “informal” trainings and one longer “formal” training. As a result of this CUP grant, 45 multi-lingual, culturally diverse participants were trained on workplace health and safety. They in turn trained 631 people in their workplaces and/or communities. Through this process, the Network and LOHP developed a model for a successful community-university partnership, based on mutual respect, joint decision-making, open lines of communication and shared resources.

Evaluation Design

This evaluation report will look at three areas that were addressed in the project:

1. Individual change in the participants who attended the LOHP/Network sponsored TOTs with respect to their knowledge of health and safety and their ability to conduct trainings.
2. Organizational change in the Network-affiliated organizations who sent members to the TOTs.
3. Organizational change in the two project partners, LOHP and the Network, and a description of the factors that contributed to the success of this partnership.

An evaluation consultant was hired to develop evaluation instruments and to work with staff in developing and implementing an evaluation plan. Several methods were used to evaluate the objectives of the project, including:

1. TOT participants completed pre-test and post-test questionnaires to assess the knowledge and skill objectives.
2. TOT participants from each organization participated in a telephone interview, in which each team was interviewed for approximately one hour, to assess individual and organizational objectives.
3. Staff from LOHP and the Network completed individual questionnaires, were involved in telephone interviews and participated in an evaluation retreat.

Key Findings/Recommendations

The key findings of this report, as well as the recommendations that were developed as a result of this project, are arranged according to each area addressed by the evaluation.

I. Participants in the Three Training of Trainers

Key Findings:

A. Participants planned and carried out a total of 40 hazard awareness trainings, in which they trained 631 people from their workplaces and/or communities on a range of occupational and environmental health concerns.

B. Participants significantly increased their awareness and knowledge of workplace health and safety, how to access information, and how to use workers' rights.

C. Participants reported feeling confident in their training skills, including doing a needs assessment, and designing, implementing and evaluating trainings using participatory activities and an interactive approach. They described how they learned activities in the TOTs that they in turn used effectively in their own trainings to encourage participation and interactive learning. They also describe how they developed new participatory activities specifically designed for their own trainings. These types of activities were described as fun, good at getting people involved and good at helping people remember what was learned. Participants were able to identify the links between environmental and occupational health issues in their communities, and to develop trainings that addressed these issues locally.

D. Participants increased their ability to use resources and develop solutions for community and workplace health and safety issues. Most participants emphasized the relationship between increased knowledge and support gained in the TOTs and increased ability to use education as a tool to address problems in the community and workplace related to health and safety hazards. The resources that have been used by most participants since the training include the Pocket Guide to Chemical Hazards (by the National Institute for Occupational Safety and Health), Material Safety Data Sheets (MSDSs), fact sheets, and the TOT training manual. These resources were considered extremely practical and important aids to their work as organizers and trainers. As one participant stated, "the Pocket Guide to Chemical Hazards of NIOSH and MSDSs have become part of our lives and we can't survive without them!" Many described the positive supportive contact with their trainers (LOHP and Network staff) as being important for the development of their increased confidence in seeking technical assistance.

E. Making new relationships with people and organizations, strengthening relationships and contacts, creating networks for help, support and advice, and contact with different ethnic and cultural groups and youth were emphasized as the most significant personal benefits of participating in the trainings. Participants felt that they created good relationships with other participating organizations and with LOHP.

F. Several participants reported an increased understanding of the links between workers' issues and community issues, as well as wanting to integrate both approaches in their organizing efforts. One stated, "I now realize that occupational health and safety is not an isolated effort or project when doing grassroots organizing, but an integral part, and interdependent with organizing efforts and interconnected to other issues in the community."

Recommendations:

1. Plan to develop a training program that involves a series of trainings, instead of a one-shot training session.

The opportunity to bring participants together at several TOTs made it possible for them to take the newly learned information back to their communities, practice using it, and have a clearer idea of what type of follow-up or additional assistance they needed when they returned to the next TOT. Participant trainers stated that the opportunity to practice, to use and review information and teaching techniques in each of the TOTs, was crucial to feeling that the information and skills were part of their repertory as trainers. Having time to use the information and skills in between the TOTs and attending more than one TOT were also mentioned as being important.

2. Be flexible about meeting multi-lingual needs and talk to participants about how they want multiple languages handled in a training.

All the information was translated into the appropriate languages, and the trainings were carried out in English, Spanish, Korean and Chinese with simultaneous translation. The initial plan had been to separate people and train each group in their primary language. However, participants did not want to be separated, and this led to the multi-lingual approach. While this was more time-consuming, it increased the interaction among participants, fostered trust, and led to a more enjoyable experience for all.

3. Tailor your program to the specific needs of the participants.

Through the needs assessment and the input of an Advisory Committee, all training materials were developed to be relevant to the concerns and lives of the participants. The Advisory Committee provided guidance on the objectives and focus of each activity and topic addressed in the TOTs. Active involvement of participants in all stages of planning appears to be a critical element of success.

II. Affiliate Organizations that Sent Participants to TOTs

Key Findings:

A. Most participants described bringing back to their organizations increased knowledge about toxins and effects on health, information on how to organize and conduct trainings, increased confidence and skills, and increased ability to help workers and community members.

B. All organizations had plans to integrate some aspect of health and safety into their organizations work. Only one organization wasn't able to carry out their formal training. Some participants stated that they were unsure how their organization would continue to integrate health and safety. Some of the challenges involved in taking on new projects were: not enough time, not enough staff or financial resources, and being overwhelmed with other projects.

C. Leadership development was an important outcome for organizations. TOT participants said they have more confidence around other members. TOT participants also reported that they had increased roles in their organization, from "just a worker" to a leader and educator. They felt the skills they had learned around training, such as speaking in front of a group, would serve their organization well in other areas of its work. Increased feelings of pride and importance accompanied new roles.

Recommendations:

1. Develop selection criteria to choose participant organizations and individuals, in order to ensure that they will be able to carry out project activities.

The Network and LOHP carefully selected these criteria in the initial stage of the project when potential participating organizations were being identified. It is important to be clear regarding the responsibilities of participation and to include a thorough orientation to partnership goals and to the project. While most all the organizations were able to carry out the tasks they had agreed to complete, some had more difficulty than others. One point that came up during the evaluation was that some organizations didn't know exactly what they were committing to when the project began, as far as the staff resources involved. It may be a good idea to re-visit their commitment, perhaps after the first TOT, to see if all organizations still believe it is feasible to participate.

2. Include money in your budget to enable participants to carry out the project activities.

Participants stated that stipends and mini-grants were critical in allowing them to participate, since these covered expenses needed by organizations in order to conduct their own trainings and attend the TOTs. Sharing the financial resources of the project plays a pivotal role, not only in achieving the project's objectives, but in fostering commitment to the goals.

3. Have a plan for how the sponsoring organizations will support the participating organizations to make the best use of the project and of their members' new skills.

This is one area that wasn't directly addressed in this project and that LOHP and the Network identified as needing further follow-up. There is a certain amount of organizational development work, which could involve guiding each team through a brainstorm of how to use new skills, field visits, etc., that could also better enable organizations to integrate the new skills and knowledge into their ongoing work. It may be useful, when trainees return from the TOT, to set up a forum for communication between trainees and their organizations' leadership or boards. This would support the larger goal of integrating health and safety into the organizations' work.

4. Respect and accommodate the different philosophies, work styles and level of resources of the various participating organizations.

This project involved 12 organizations that have different mission statements, different levels of staffing and financial resources, that focus on diverse issues and are geographically far apart. However, a successful collaboration resulted by establishing clear communication patterns, being respectful of each organization's mission and style, and making the trainings relevant to the participants.

5. Form an Advisory Committee to provide guidance to the project.

An Advisory Committee can serve as a forum for participating organizations to contribute ideas and guidance to the project activities. In this project, staff communicated with the Committee through regular conference calls and meetings. In addition, a committee can include people who will bring other perspectives. This project's committee included representatives from labor, and this served to initiate positive dialog between environmental organizers and labor, and led to ongoing collaborative partnering. In order for these combinations to have a positive result, careful consideration in the selection of individuals is warranted.

III. LOHP – Network Partnership

Key Findings:

- A. One of the most important outcomes of project participation cited by both organizations was that their organization made increased links between environmental justice and health and safety issues, in both the community and the workplace. Both organizations expressed an increased commitment and

enthusiasm for the task of integrating workplace health and safety and environmental justice issues into their projects and campaigns.

B. Both the Network and LOHP reported that they felt the partnership was successful and that they each had increased their understanding of their role as a collaborative partner. Both organizations are excited about potential joint projects in the future.

C. Each partner provided special access for the other. LOHP provided access to University resources, as well as funding and special skills in the area of occupational health and safety. The Network offered access to a diverse group of community organizations and their participants, and expertise in the area of environmental justice. Both partner organizations stated the “other” group was extremely supportive and interested in new and different ideas.

D. Both partners agreed that while the LOHP-SNEEJ partnership was highly successful, it was not possible to establish linkages for the community to other university resources and programs. There was interest in re-examining this goal, with the recommendation that this should really be a second year goal after the training teams are more established. Establishing true collaborations between universities and communities is a difficult challenge. A large university’s focus is on research and professional relationships, whereas a community organization, like the Network, has a political, organizing and advocacy agenda.

E. As a result of the project, the partners produced a multilingual TOT curriculum (funded by NIEHS) that can be used by other organizations. This type of curriculum was identified by participating organizations as being essential for their ongoing training programs. The curriculum is very unique in that it provides information in multiple languages and used easy-to-learn activities that can be carried out by new trainers.

F. TOT participants also stressed the value of this partnership. The connection between the University and the community was mentioned as an important benefit. As one said, “The program LOHP has organized to bring its knowledge to people who cannot go to the University, but that work in the community, is so important. How they bond with the community organization is a big help because before, the community did not have this relationship.”

Recommendations:

1. Allow an extended period of time to establish a collaboration that involves multiple community-university linkages.

It was mentioned previously that LOHP was not able to provide links for the community to other university resources. Given the different organizational cultures, perspectives and missions, it is very difficult to achieve this goal in a one year grant. Overcoming the distrust that may exist towards universities and agencies can be a major challenge, and universities first need to work with communities on specific successful projects in order to foster trust. Funders must recognize that partnership programs involve a process that is likely to require several years of funding. In this project, the Network and LOHP realized that linking community groups with other university programs should be a second year goal.

2. Establish clear and accessible communication systems.

LOHP and the Network worked very hard to establish clear and open lines of communication, as well as to have LOHP and Network staff in communication with participants and participant organizations. An Advisory Committee was formed which was helpful in planning the TOTs and maintaining a close

link between community and workplace needs and the resources of the partner organizations. This Advisory Committee consisted of representatives from LOHP, the Network, two labor unions, and the University of New Mexico School of Public Health. The commitment to open lines of communication required a lot of time but it was essential to the development of trust and a collaborative working relationship. Each organization had to establish channels and decide who would communicate with whom about what. TOT participants were kept informed through meeting summaries distributed in English and Spanish, and through an informational bulletin.

It is a good idea to begin the project with a staff retreat, where each partner can discuss in depth their reasons for advocating a particular approach to communication and decision-making; also, how that approach relates to the overall goals and objectives of the project. Each partner should also know about the current policies and patterns of communication and decision-making in each partner organization. A "Communication Map" that depicts the patterns of communication for this project is found on page 33.

3. Establish community ownership of the project.

Throughout the project, the driving philosophy was that the project goals and activities had to be most relevant to the community involved. Each organization had a strong commitment to this philosophy. To carry this out, the partners conducted needs assessments, consulted the Advisory Committee, set ground rules for meetings, and worked to overcome the tendency of university staff to resist community involvement in decisions. In addition, workshop participants were critical to the project as they carried out trainings in their own community, incorporated feedback from the community and LOHP, and continued to provide ongoing training sessions.

4. Make project decisions jointly.

LOHP and the Network shared resources and decision-making. Both agreed that joint decision-making takes a lot of time, but that this fostered trust. In addition, the people for whom a certain decision is most relevant need to be involved in making that decision. At times this may involve the project coordinator, the directors of each organization, or the TOT participants themselves. Decisions should be driven by community needs and made by consensus. The process for decision-making should be discussed, agreed upon at the onset of the project, and re-evaluated periodically.

5. Define and establish clear roles.

It was important that each partner organization communicate clearly regarding the mission, goals, staffing responsibilities, resource availability, priorities, lines of communication and decision-making. Meetings were held every couple of months to look at the project overall and check on progress. Throughout the project, the partners discussed who would take the lead in certain decisions or in carrying out certain tasks. A good working relationship was established, and the project moved forward because each partner felt accountable to the other and worked diligently to meet their commitments to the project.

6. Recruit and support diverse, skilled staff.

It was beneficial that the project included staff who represented diverse ethnic and cultural backgrounds, and had language skills appropriate to the target communities. One aspect of staffing which was identified for follow-up was the need to make sure that the responsibility for the project was spread throughout the organizations. In this way, a partnership could develop between organizations and not just between the individuals involved. In the LOHP-Network project, a lot of responsibility fell upon the project coordinators from each organization.

7. Evaluate and re-evaluate.

Early in the project, staff should discuss goals, philosophy, assumptions and concerns about working with partner organizations. Define for each organization what would constitute a successful collaboration and how success will be measured. Review this discussion regularly, and whenever problems arise, clarify different expectations, concerns and needs.

California-Arizona Consortium's
**Hazardous Waste Worker
Training Program**



Evaluation Report

Grant Year: September 1997 - August 1998

Tobi Mae Lippin, Anne Eckman and Katie Rubanowice Calkin

New Perspectives Consulting Group

Durham, NC

August 1998

California-Arizona Consortium's

Hazardous Waste Worker Training Program

Evaluation Report

August 1998

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California-Arizona Consortium's Hazardous Waste Worker Training Program

Pilot Impact Evaluation Report, August 1998

Executive Summary

The California-Arizona Consortium (CAC) participates in a NIEHS-funded Worker Health and Safety Training Cooperative Agreement (2 U45 ES06173). To gain a deeper understanding of how and why its program has influenced the health and safety of its training participants and their workplaces, the Consortium commissioned this pilot study using qualitative research methods. New Perspectives Consulting Group carried out the evaluation. This report focuses on the impact of the Hazardous Waste Worker Training Program on the health and safety of its training participants and their workplaces, including the impact of trainings on workers who are native Spanish speakers. This study was conducted from September 1997 to August 31, 1998.

Evaluation data were gathered through seven focus group interviews with 49 participants of the Consortium's training programs. Participants shared their perceptions, experiences and assessments of how the Consortium training influenced their health and safety and their workplaces. Focus group participants worked in a broad range of occupations and were evenly divided between front-line laborers and technical, professional and managerial positions. Slightly more than one-third of focus group participants were members of a union.

Key findings from the evaluation include the following:

Focus group participants attributed significant changes in their awareness, perceptions, thinking and analysis about health and safety, as well as improvements in workplace systems, work practices and emergency response to CAC training experiences. Identified changes included: sharpened hazard awareness, assessment and job planning; upgraded or newly developed standard operating procedures, written health and safety plans, and confined space policies; more informed selection and frequent use of personal protective equipment (PPE); enhanced housekeeping; increased oversight and selection of contractors; and better incident prevention, preparation and response.

The impact of CAC's training was reported to be far wider than its course registration would indicate. Focus group participants had disseminated the courses' content, written materials and learnings through informal networks with co-workers, friends and family members. Participants who worked in roles as inspectors, consultants and trainers shared Consortium training information, methods and materials with other workers and worksites as they carried out their jobs.

Spanish speaking workers who participated in CAC's Spanish language training program detailed the paucity of available Spanish language health and safety training courses and materials, and the vital role that the Consortium's training and relevant, easy to use materials had played. Participants perceived that Spanish speaking workers sought out information from their Spanish speaking co-workers because they trusted each other. In addition to conducting training back at their workplaces, participants noted that they were now also consulted by other workers and even managers as resource people.

OSHA regulations were identified as a vital support for health and safety improvements sought by people in technical, supervisory and managerial positions as well as frontline workers. Knowledge about worker rights and OSHA standards were especially useful when combined with hazardous materials and emergency response information provided in trainings.

CAC trainings had helped to create a 'community' of CAC learners and worksites who 'speak the same language' and have a shared health and safety framework, according to focus group participants who work in government, manufacturing, universities, construction, and environmental clean-up. Having multiple workers, and both workers and managers, from the same worksite attend training classes was identified as particularly crucial to enabling workplace health and safety changes. Ongoing CAC programs and contact with program staff was also perceived as a key support.

Focus group participants identified the most significant barriers to making health and safety improvements as: the conflict between economic pressures to maximize service and the need to invest resources, both economic and human, in health and safety; and key decision makers in organizations who may not appreciate the occupational health issues facing their workforce.

Recommendations to the Consortium, in light of these findings, are as follows:

1. Keep the focus on legal rights and regulations.
2. Foster additional opportunities to train multiple workers from the same worksite.
3. Initiate a mini-needs assessment to determine how to train decision makers at higher levels of management than usually participate in CAC training.
4. Develop a multi-faceted evaluation strategy that meets the needs of all Consortium members for the future.

Tobi Mae Lippin, Anne Eckman and Katie Rubanowice Calkin

New Perspectives Consulting Group, Durham, NC

BACKGROUND

The California-Arizona Consortium (CAC) participates in a NIEHS-funded Worker Health and Safety Training Cooperative Agreement (2 U45 ES06173). Members of the Consortium include: University of California at Los Angeles Labor Occupational Safety and Health Program (LOSH), University of California at Berkeley Labor Occupational Health Program (LOHP), University Extension, University of California at Davis (UCDX), Arizona State University (ASU), and the Alaska Health Project (AHP).

The primary purpose of the Consortium is to provide a full range of health and safety hazardous waste worker training in EPA Region IX. The Consortium course offerings cover a range of topics, including hazardous waste cleanup and investigation, supervisor and refresher courses; treatment storage and disposal of hazardous waste and refresher courses; first responder and basic specialized awareness, operations, incident command and refresher courses; and hazardous awareness courses. Program trainees work in a broad range of positions, including semi-skilled workers, first line supervisors, technicians, managers, firefighters and emergency responders. Increased outreach to minority and underserved groups, especially Latinos, is a current focus of the Consortium. Each program utilizes a combination of program staff and consultants to lead their courses.

To gain a deeper understanding of how and why its program has influenced the health and safety of its training participants and their workplaces, the Consortium commissioned this pilot study using qualitative research methods. In consultation with the Consortium, New Perspectives Consulting Group designed and carried out the pilot evaluation. This report focuses on the impact of the Hazardous Waste Worker Training Program on the health and safety of its training participants and their workplaces, including the impact of trainings on workers who speak Spanish as their native language. This study was conducted from September 1997 to August 31, 1998.

STUDY DESIGN

Evaluation Question:

In order to assess the impact of CAC's training program, the evaluation focused on the following questions:

1) How has CAC's Hazardous Waste Worker Training Program influenced health and safety awareness, actions, and practices back in the workplace of training participants?

2) What key factors did participants identify as supports and barriers to these actions?

3) How can the CAC better meet participants' health and safety training needs?

In light of the Consortium's particular interest in understanding the processes shaping how its training program impacted workplace health and safety, the evaluation collected primarily qualitative data. Data was gathered through seven focus group interviews with participants of the Consortium's training programs. Participants shared their perceptions, experiences and assessments of how the Consortium training influenced their health and safety and their workplaces.

Evaluation Instruments:

The focus group interview guide, the instrument used to guide data collection, was the result of a participatory design process involving representatives of all Consortium members. All focus group participants also completed a data sheet that collected basic demographic information.

New Perspectives conducted a series of interviews with Consortium members to identify key evaluation concerns and then facilitated communication among members to arrive at a core set of questions for the focus groups. These discussions resulted in two versions of the focus guide (see *Appendix A*) and a

participant data collection sheet (*see Appendix B*) that were used during this project.

Both focus group guides shared core questions concerning the following.....

- health and safety awareness, work practices, and procedures

- hazardous materials spills and emergency response

- use of program training materials

- suggestions for program improvement

The majority of Consortium members also chose to include topics and questions that explored:

- health and safety concerns raised by participants

- employer attitudes and actions

However, ASU chose not to include these two topics. They instead assessed the impact of training on workers' compliance with company procedures. Supplemental individual interviews were also conducted with participants in the Alaska Health Project trainings.

Focus Group Site Selection:

Each Consortium member sponsored at least one focus group for English speakers. In addition, LOSH and LOHP each organized a focus group of native Spanish speaking workers employed by the metal plating industry. All of the groups, with the exception of the AHP, were held during work hours with the cooperation of participants' employers. As an incentive, employers were offered a discount on future Consortium classes in most cases.

Each program except the Alaska Health Project, selected their focus group audiences based on the following criteria: ease of securing access and participation from employers and participants who had all attended the same type of class (e.g., a 40 hour HWWT). The Alaska Health Project included participants who had attended several different courses. Two of the seven focus groups had training participants drawn from one employer. Five of the focus groups had training participants drawn from two to six employers.

Participant Selection:

Each consortium member identified and made initial contact with potential focus group employer sites and/or workers. A mix of participants from different workplace departments were recruited. All groups, except the two metal plating industry groups, included a mix of workers, technicians or professionals, supervisors and managers. However, employees and their immediate supervisors from the same workplace were not included in the same group so as not to inhibit participant discussion. New Perspectives or the Consortium members followed up more specifically with employers to recruit participants, to confirm sites, to explain the focus group process, and to communicate other details.

Data Collection:

All but the ASU focus group were recorded using an audio cassette recorder. Focus group tapes were transcribed in full by professional transcribers. The evaluators verified the transcribed interviews conducted in English; Sonia Alas of LOSH verified the interview translated and transcribed from Spanish. The ASU focus group was recorded by two note-takers; these notes were synthesized and verified by the focus group facilitator. Tobi Lippin of New Perspectives Consulting Group conducted the focus groups held in English; Marta Segura of LOSH conducted the focus group held in Spanish.

Data Analysis:

In-depth analysis of the focus group data was conducted to identify and name patterns and recurring themes. While the evaluation questions provided a broad outline of areas for analysis, the specific themes and categories identified in the data reflect participants' own understandings, feelings and words. Qualitative data coding and analysis was carried out using the text analysis program QSR NUD*IST 4. Participant data sheets were analyzed for frequency distributions using Epi Info 6.02, a data analysis program developed by the US Centers for Disease Control and Prevention.

The evaluation design included three different levels of analysis: Level One analyzed the influence of Consortium programs in aggregate; Level Two focused on the experiences specific to the focus groups whose participants were native Spanish speakers; and Level Three provided information about individual Consortium member programs.

Evaluation Research Team:

The program evaluation team was led by Tobi Mae Lippin, Director of New Perspectives Consulting Group, with research support from New Perspectives associates Katie Rubanowice Calkin and Anne Eckman. Lippin developed the overall design of the evaluation instruments, conducted interviews, analyzed the data, and wrote the evaluation report. Calkin and Eckman were responsible for conducting telephone interviews, coordinating data management, and contributing to the analysis and writing of this report.

Lippin, an adult educator, researcher and consultant, directs New Perspectives Consulting Group based in Durham, North Carolina. She conducts organization and training program evaluations and uses qualitative and quantitative research methods in assessment and evaluation. Lippin is co-leader of the NIEHS funded Self-sufficiency Evaluation and Research Pilot Project, and also conducts impact evaluations for other NIEHS hazardous

materials training grants. Lippin has a Masters of Education in Training and Development and Adult Education.

Katie Rubanowice Calkin has a Masters of Public Health in the area of Health Behavior and Health Education. She has worked on numerous public health program evaluations with New Perspectives Consulting Group and the Center for Creative Education. Anne Eckman has a PhD in Cultural Studies. She has conducted research and evaluation of women's health programs, grassroots organizations, and public policy for both community-based organizations and university research projects. She joined New Perspectives Consulting Group in June 1998.

Limitations and Weaknesses

Because the logistics of organizing focus groups require participants to all assemble at an appointed time and place for a one to two hour period, participant selection focused on employers with whom consortium members have ongoing relationships. This included both employers who repeatedly send employees to trainings and employers where large groups of workers had been trained. These findings thus may not fully represent the impact of training programs in workplaces where few workers received CAC training. The role of employers in selecting focus group participants may have also biased the representativeness of the participants.

While the evaluation was successful in conducting two focus groups with participants for whom Spanish was their native language, one of these groups had to be conducted in English at the insistence of the employer. Communicating in English may have limited the ability of these participants to fully express their experiences. This is noteworthy considering their training had been in Spanish. The use of a different focus group guide limited the full exploration of some issues in the ASU group. Furthermore, restricting data collection to note-taking, as opposed to tape recording, in the ASU group

significantly limited the completeness and comparability of the data from that focus group. While the average length of other groups' written transcripts was 30 pages, the ASU transcript was only 10 pages.

FINDINGS

Findings and recommendations both for the focus groups in aggregate and for the focus groups conducted with native Spanish speakers are reported here. Individual program comments are being reported to the director of the Consortium. In addition, each consortium member will receive a report of their program-specific findings. In order to protect the confidentiality of focus group members, participants' names and genders have been changed. Except where it would compromise confidentiality, descriptions of participants' occupations have also been provided. In cases where a participant's identity could not be exactly determined from the focus group taping, the person has been identified with the greatest specificity possible.

Description of Participants:

A total of 49 Consortium trainees participated in the seven evaluation focus groups. The focus groups for native Spanish speakers included a total of 11 participants. Focus group participants were 87.7% male and 12.2% female. Participants identified their race/ethnicity as follows: 4.1% African-American, 6.1% Asian-Pacific Islander, 22.4% Hispanic/Latino, 59.2% Non-Hispanic White, and 6.1% Other (2.0% did not answer the question). Of the participants, 36.7% had completed 12 or less years of schooling and 61.2% had completed at least some college.

Focus groups participants were selected to represent the types of workers and workplaces trained by the Consortium. Focus group participants worked in a broad range of occupations (*see Figure 1. Type Employer*). Focus group participants were evenly divided between front-line laborers and technical, professional and managerial positions

(see Figure 2. Type Worker/Manager). Slightly more than one-third (36.7%) of focus group participants were members of union.

Figure 1. Type Employer, by percentage (N=49)

Figure 2. Type Worker/Manager, by percentage (N=49)

I. Health and Safety Changes

Focus group participants reported numerous changes made in work practices, policies and procedures in efforts to minimize health and safety problems. These included: sharpened hazard awareness, recognition, assessment and job planning; upgraded or newly developed standard operating procedures and written health and safety plans; new or revised and followed confined space policies; improved ventilation; more informed selection and frequent use of personal protective equipment (PPE); enhanced housekeeping; increased oversight and selection of contractors; and better incident prevention, preparation and response.

The processes of how these changes were made varied widely depending on the workplace, position of the person seeking the change and the health and safety problem. In some cases individuals and groups from the same employer recognized hazards and necessary changes and because of their position and management support were able to obtain changes readily. In other cases, participants reported raising their concerns and having to advocate over time for health and safety improvements. They were successful in most cases, but unsuccessful in some. Below are descriptions of the major areas of change and representative quotes from participants to illustrate each of the major areas in which health and safety changes were reported.

Sharpened hazard awareness, recognition, assessment and job planning

A “new way” to look at workplaces and see unsafe conditions was described by evaluation participants. They indicated that CAC training increased their awareness of all hazards not only those involving hazardous materials.

To me it’s brought a bigger awareness of . . . even hidden dangers as well as the obvious dangers. And more so on the obvious dangers. It really spelled it out that they were bigger dangers than I had thought [and] gave me a new way to look at them. — Steven, Consulting Firm Employee

There's a lot of things you never even thought about. I work around voltage and I hadn't even thought about chemicals. The class taught new ways of thinking about things. — Charlie, Waste Water Operator, Local Government

Assessment and preparation prior to initiating job tasks increased following the training according to focus group participants. They named assessing hazards by reading chemical labels, and consulting Material Safety Data Sheets (MSDSs) and other resource materials as part of preparing for hazardous work.

Before you could kind of, say, wing it. You'd go in and depending on what you found, then you'd take steps. Well, now we have to do much more preparation for the individual sites in that regard. — Laura, Materials Associate, Local Government

You kind of stop and really take a second or third look at the situation and evaluate them before you just jump in. You just think a lot more. — Bob, Hazardous Materials Clean-Up Crew, Local Government

Upgraded or newly developed standard operating procedures and written plans

Following CAC training a variety of written health and safety plans and operating procedures were developed or upgraded according to evaluation participants. Participants outlined changes including chemical substitution; improved housekeeping and storage of hazardous materials; institution of decontamination procedures following chemical sampling; development or revision of site safety, confined space, excavation, and emergency response plans; employer provision of work coveralls and routine laundering; and health screening and fit testing of new employees prior to beginning work.

[The emergency response] policy has changed...in the last year or so. . . . We don't go to what they consider the dangerous ones (hazardous materials incidents) anymore. It kind

of did put some limitations as to what [hazardous spills or releases]... we will respond to.
— Emergency Response Worker, Local Government

I just did a hazardous materials management plan. In that we're a laboratory I had to go through the fire marshals . . . [I] had to go talk to [the local] treatment plant, find out what their regulations were . . . It's (the training) more of just almost a thinking process of where you go to find out the information, and you don't get hit by this overwhelming feeling of just, well, how do I do that? It's like you know what to do more so and where to go for information. — Maria, Environmental Management, State Government

The classes ... help me re-evaluate the [safety and health] programs. Do we need to have more training? How does it apply to what we do? Standards say you have to . . . but what is the practical application. — Edward, Health and Safety Manager, Local Government

As far as updating our safety plan, you always like to have the latest information. They seem to have the latest and greatest on the different regs. So that's helpful. — Local Government Employee

Newly created or revised and more frequently followed confined space policies

With confined space regulations being one of the newest OSHA regulations, reports of its integration into the workplace were more pronounced than comments concerning other new policies. We highlight a few of the comments specific to confined spaces and the various ways CAC training and refresher have influenced workplace impact.

[As a result of the training] we're trying to define our confined spaces and how deficient we are and the equipment we use to monitor air. — Dan, Waste Water Operator, Local Government

We store a lot of waste in cargo vans. I asked [the new health and safety engineer] to come and do an inspection looking at them as confined spaces. He's going to help me do some procedures and he told me the first thing in working in a cargo van is that you

have to have a buddy when you work in there, even though it's not be[en defined as]...a confined space. — Mark, Hazardous Waste Program Director

We're realizing we were doing confined space entries without the proper procedures, and we've stopped doing that. And we (inspectors out in the field) also stopped ...other workers from doing that. — Local Government Inspector

The [fire] department has put together a confined space [rescue] crew, that's how much change there has been in the department. — Local Government Employee

New and upgraded ventilation systems or renewed maintenance

Problems with contaminated air and poor ventilation were reported to have been brought to the attention of management in numerous workplaces. Focus group participants from different industries reported improvements.

I've been on jobs where questions have been raised about what fumes are and whether we should be in the same areas as the fumes. In some cases we left the area and in other cases they found a ways to ventilate the area. — Case, Asbestos Worker, Union Contractor

One thing we did install is a fume hood. — Leonard, Hazardous Materials Manager, Private Industry

I was working with a specific chemical and I sensed that it was hurting me. . . . I explained and asked her (my boss) if we could make a few changes in order to be safer when working. . . And the [ventilation] problem we had was under control. — Xavier, Metal Plater/ Hazardous Materials Worker, Metal Plating

Improved Housekeeping

Focus group participants also described improved housekeeping practices they attributed to CAC training, including the storage and organization of chemicals in their facilities.

They're responsive. They (the employers) try to maintain clean areas . . . Before [the] company was a mess. — Metal Plating Industry Employee

Before [the training] all the plant ha[d] cans of solvents everywhere with a lot of hazard[s] for fire. Now we have more order in this. We have just specific areas for different stuff. [We have] more organization. — Metal Plating Industry Employee

More informed selection and more frequent use of personal protective equipment

Focus group participants described more informed and frequent selection and use of personal protective equipment (PPE), including types of respirators, respirator cartridges, gloves, and chemical protective suits. Reports went beyond individual practices to the institutionalization of new fit test procedures; development or revision of written respiratory protection programs; a switch to air supplied respirators; removal of faulty self-contained breathing tanks from service; improved respirator cleaning methods; purchase of new PPE; and more informed and careful selection of appropriate respirators, gloves and other protective clothing.

Before we went to the training, we didn't know that different kinds of respirators depend [on] what you are doing. Now... we can ask for the correct respirators that we need. — Felipe, Waste Water Technician, Metal Plating Industry

People tend to just grab gloves . . . In reality, it's probably going to be useless with what you're working with . . . so I've taken some things back to that committee and we've actually incorporated a lot of it into the chemical hygiene plan. — Leonard, Hazardous Materials Manager, Private Industry

After the 40 hour class, I actually went and did the respiratory protection program. [Put down] documentation, we had a memorandum of understanding with the university to do the quantitative fit testing. Before that there was no written respiratory protection plan. We...developed it and the management committed to it. — Maria, Environment Management, State Government

Increased oversight and selection of contractors

Contractor oversight and selection changed following CAC training when managers realized their liability if contractors working at their facilities used unsafe practices

according to focus group respondents. This dialogue from one focus group illustrates the change.

One of the primary areas that it's (the training) helped me focus on is overseeing when a contractor comes on site to do work and any hazards associated with the work that they do and how that can impact our work. It's kind of this odd thing that you have to think about that you wouldn't normally think about. — Mark, Hazardous Waste Program Director, University

I hadn't thought of this but it's true. I hire lab people to come in. I have changed contractors for just that reason. I had some people that came in... I evaluated what I saw [and] how they were operating [and]...decided to find someone else. Later [I] found one I was really happy with. It cost a little bit more to have the better people come in, but management doesn't question me. I said, 'Look, we're not going to have an incident with these people, with the other ones we are'. — Leonard, Hazardous Materials Manager, Private Industry

Changes yet to be made

Focus group participants also described changes that they had requested but have not yet been addressed. In addition to more general lack of response from employers (*see Barriers to Health and Safety Changes*), several focus group participants specifically identified their difficulty obtaining medical surveillance.

I have been here for three years and I have asked for a letter, an exam, and they haven't given it to me. — Eduardo, Water Treatment Technician, Metal Plating Industry

In one focus group the following dialogue ensued between two different participants trying to obtain medical surveillance in the same government unit.

We wrote several memos to the medical surveillance program [to followup workers' requests for medical surveillance], but I'm not sure how that has come about. — Laura, Materials Associate, Local Government

Well, it hasn't been implemented, because you're looking at the people [who requested it and haven't yet seen it]. — Drill Rig Operator, Local Government

II. Better Incident Prevention, Preparation and Response

Readiness to respond using new learning and increased confidence

Participants reported that the training gave them tools and information to think through preventing and minimizing spills at their sites. They also reported increased confidence because of the new knowledge garnered at the CAC training.

Before we had [absorbent materials for spills], but I think we didn't use it correctly. — Metal Plating Industry Employee....

[We've had] minor chlorine leaks, but we're more conscious of what we are doing. We were new and we're getting better. The training has helped. — Fran, Waste Water Operator, Local Government

[I'm] in the position to introduce other steps or safeguards — some of the lessons that I hear at the class, or the approach they take. . . . We are responsible for small spills and things that we can take care of in our own community or organization or facility. And that thinking and that approach (from the training) I use to set up procedures in the event that we have an incident. — Philip, Shop Supervisor, University

Before the training during an emergency I acted in an incorrect manner, and that was because I didn't have training. But since then, the training helped me in how to act during an emergency, to evaluate the dangers, to warn the people, and to think with confidence and safe[ty]. — Metal Plating Industry Employee

Applying knowledge during an incident

In reports of actual incidents which occurred following training, participants described applying what was learned at CAC trainings.

[The workers] didn't realize where the water was coming from or anything. The first thing they did was take a PH reading . . . The issue was that if that person was not trained that first saw this, he would've probably immediately wanted to shovel it out the door and down the drain. — Philip, Shop Supervisor, University

We had a fire [at the landfill]. People who were trained were calm, but the new people went nuts. — Harry, Solid Waste Worker, Local Government

A 4 liter bottle, half-full, just kind of dropped. And although it was oil — nothing that was volatile that was going to come through — ... I knew what to do, how to wear the gloves, and whether to evacuate the area. — Focus Group Participant

There is a big tank, and a line where we walk. The pump was throwing the solution into the air, like a broken water pump, so he [a worker] ran under the falling solution, to turn off the pump. I explained to him how to do it. Then, on another occasion, he just went to turn the switch off, and that was all. — Metal Plating Industry Employee

It made me aware of the right things to do and to protect the area until the right people arrive. — George, Engineering Inspector, Local Government

Speaking the same language

Participants reported that having a number of workers from the same work site trained by CAC enhanced their collective ability to respond to spills and emergencies. They further noted that people who had attended training were much better able to act in emergency situations than those who had not.

Now that I know I have some people who have been trained [in HazMat Emergencies], I can ask [my coworker] to assess and we can speak the same language. It's a good communication tool. — Edward, Health and Safety Manager, Local Government

Those that attend [the training] know how to convey that information and deal with it very easily. Those that have not attended haven't a clue as to how to process the information. — Philip, Shop Supervisor, University

III. Use and Dissemination of CAC Learning, Methods and Materials

CAC training and reference materials used on the job

Regardless of their jobs, workers, technicians, inspectors and managers, all reported keeping their training and reference materials from CAC trainings accessible so they were able to research hazardous materials and situations when needed.

I have used the books to look up things I found and what to do. Someone dumped AMWAY products and we looked up the labels. Since it was AMWAY, we knew it wouldn't be too dangerous. But there was phosphorous — Harry, Solid Waste Worker, Local Government.

The hazardous material book [the NIOSH pocket guide] is always good to have on hand. That's the Bible which you're going to have to find out what chemical's what and what you can be exposed to — Focus Group Participant

I keep all the books from whatever training class that I've been in [and] refer back to them later. —Focus Group Participant

[I was] trying to find some off the wall pesticide...to find out what regulations would apply to it; ordering the proper respirator filters. I mean, all these type of things. It just seems the [training] materials just become more of a resource at your fingertips. — Maria, Environmental Management, State Government

Training materials and techniques adopted by participants who train others

Focus group participants who themselves conduct training as part of their jobs explained that they adopt CAC training materials and methods. They indicated that CAC training provided them with the best distillation of key changes in regulations, policies and procedures that they could find. Some said they borrowed training methods and materials to hone their own health and safety trainings.

It's really useful for me to come and get new ideas on how to train because I have the same problem they do. I have to train these people every year and try to figure out what to do with them and keep them from snoring while I'm teaching them. So, that's kind of what I take from some of the class about regs and other things. — Leonard, Hazardous Materials Manager, Private Industry

It was nice to see different methodologies, so it gave me more resources to use, more little tools to put in my bag of tricks to pull out at the appropriate time. — Thad, Health Physicist

Professionals share CAC info with others as part of their jobs

Evaluation participants who visit other work sites or consult with employers as part of their jobs shared what they learned at Consortium trainings.

There was one segment that was given in my first refresher training here . . . where they talked about the NFP classification. That was really useful. And that's stuff that we can go out and use. You know, we use it to educate businesses. That kind of thing is useful. —Scott, Inspector, Local Government

Training has helped to answer questions of concern to the public about what is safe to throw away. — Harry, Solid Waste Worker, Local Government

If we are on a site where they've had a problem in a confined space or any Hazmat spill, we're able to tell their employers that they can't let their employees in. We're not OSHA inspectors, but we know enough about the OSHA regulations [from the CAC training]. — Inspector, Local Government

Knowledge learned at CAC training shared informally with others

Focus group members described sharing hazardous materials information with family members, neighbors and friends. Their sharing included information that others were able to use back in their workplaces.

[The training] extends from workplace to home, storing common household chemicals. . . 10 years ago I used to use gas to clean things. I didn't realize it was such a big deal. — Charlie, Waste Water Operator, Local Government

In talking to [someone who has a different employer] . . . an issue came up about safe working environments, safe work place, and employer responsibility and so forth. . . . By my giving him some information on general industry safety orders and what his worker rights were, he was able to go back through his chain of command and change a few things. So even though it wasn't HazMat related, it did result in a safer work environment for someone totally unrelated to the class. — Thad, Health Physicist

IV. Supports for Health and Safety Changes

Many factors were discussed by focus group participants as supporting their efforts to make changes back at their workplaces. Key supports identified by both workers and managers fell into the following four broad areas:

1. Knowing about and using OSHA regulations
2. Multiple workers from the same work site, and both workers and managers from the same work site, attending training classes
3. Workplace commitment to identifying and responding to health and safety needs
4. Ongoing availability of CAC training programs and program staff

The complexities of health and safety in the workplace, differences among various workplaces and industries, the dynamics between workers, professionals, managers and labor unions were represented in the range of focus group participants and groups. Here we present findings about the top supporting factors and the different perspectives about these supports.

1. Knowing about and using OSHA regulations

Focus group participants indicated that at times workers and managers used their knowledge about OSHA regulations in similar ways and at other times in different ways. They both claimed using OSHA regulations to reinforce their requests of upper management to buy into recommended health and safety improvements. However, managers also used OSHA regulations as guidelines to bring and keep their own shops in compliance. Workers used their OSHA rights to refuse unsafe work and to file health and safety complaints.

OSHA regs “back-up” worker and manager calls for change. Both workers and mid-level managers participating in the focus groups indicated that OSHA regulations served as tools with upper levels of management to “back-up” their calls for design, policy, procedural, or equipment changes.

The other thing is, when you go to your manager and say listen, I’m letting you know this and I’m letting you know this from an expertise standpoint. This is the regulation. This is the law and you’re being notified right now by me. And what you do right now is your own business but you are liable. That’s what most of these regulations are for. — Focus Group Participant, Open Enrollment Class

Sometimes you run into the problem with upper management who don't understand what we do. You're talking to an accountant. He doesn't understand hazardous waste. He's not interested in hazardous waste. He says to you, 'This is gonna cost \$2,000 and you're going to use it how often?' [You say] 'Well, we're going to use it once a month.' [He says] 'Well, do you really need it?' And it becomes one of these management decisions of risk and so forth. It helps to be able to quote to him the regulations that say... 'it doesn't matter whether we do it once a year...[if] we're above the PEL on this material we cannot be going in here and doing this.' — Leonard, Hazardous Materials Manager, Private Industry

Managers knowing about OSHA regulations aids compliance. Managers who participated in the focus groups and who are responsible for compliance with OSHA regulations said they used information about OSHA provided at CAC training to keep their workplaces in compliance.

They not only tell you what you should be doing, they tell you what happens if you're not doing what you should be. And for the most part, I think any business would be a lot happier with the extra time and the little bit of effort it usually take to do things right, as opposed to the fines that happen when you do things wrong. — Jack, Project Engineer, Consulting Business

I remembered hearing that . . . you really need to get [MSDS sheets] from the manufacturer . . . so we had to . . . go back to the vendors and ask them to supply the MSDS sheets. . . [The training] would keep us in compliance, is what I am saying. — Philip, Shop Supervisor, University

Knowing rights influenced worker confidence and action. Worker confidence to raise questions and perform work increased following CAC training, according to both workers and managers participating in the focus groups. Many workers reported that awareness of both safer work practices and how to assert their worker rights helped boost

their confidence and ability to work more safely. Workers also noted cases where exercising their rights to refuse work led to wider workplace understanding of that right.

I think one of the biggest assets we've gotten here in our program from the training is that it makes us aware of our rights as employees. And the OSHA regulations that regulate what we do everyday and what we're protected [on], what we don't have to do because someone tells us to do. [This] has really made an impact on our safety and confidence in what we do. — Jerry, Supervising Hazardous Materials Specialist, Local Government

I liked it because it not only focuses on safety, but also on laws that should be reinforced by the State. I also liked that we talked about the worker's rights, and has giving us the tools to fight with bosses that are abusive With

this knowledge we know what to do. — Metal Plating Industry Employee

It was like well, you guys didn't want to do the job. . . . That's the threat they (the supervisors) always used, they may not do it but they will threaten you with it. But at the same time I think we felt safe what we were doing (refusing to work in unsafe conditions) and after a couple of phone calls I guess he (our supervisor) felt safe that we did make the right decision. And then some other policies came into effect subsequent to that. —

Kevin, Drill Rig Operator, Local Government

We learned to say no. A number of workers who participated in different focus groups indicated that indicated that they had filed OSHA complaints about unsafe or unhealthy working conditions as a last resort to protect themselves from dangerous working conditions. The following dialogue about filing an OSHA complaint also explains how workers used the right to refuse unsafe work.

We've learned to say 'No'. And if they (management) continue to pressure us, we call OSHA. — Tomas, Machine Operator, Metal Plating Industry

Oh, you've called OSHA? — Interviewer

Oh, yes. Several co-workers have called OSHA. OSHA comes over and fines the company, and [the company] has to take care of things they (OSHA) think are unsafe for the workers' health. — Tomas

And...what type of process has changed because of the complaints? —
Interviewer

Well, when one refuses to do something, the supervisors do not pressure us anymore to do the job. And they are the ones who go out – to Home Depot or places like that – to buy the required equipment in order [for the workers] to be able to work safely. —
Tomas

2. Training multiple workers produces multiple positive effects

Focus group participants reported that having multiple employees from the same workplace attend the same training classes led to increased support for workplace health and safety changes in several different ways. The overall effect of having multiple workers trained, both within a given type of position and across worker and managerial positions, appears to be synergistic: having multiple people trained can help to create a broader base of understanding and support for changes.

Co-workers who attend trainings together were able to support each other in following safer work practices and in advocating for changes back in their workplaces.

Everybody's more aware of what's going on and when they take these classes they're kind of watching out for one another to a certain extent, you know, say, hey, you're messing up. — Case, Asbestos Worker, Union Contractor

We've (co-workers at a company who've attended trainings) been less willing to go along with things and more likely to go forth and say look we need some more

equipment, we need better respiratory protection, we need some suits. —
Leonard, Hazardous Materials Manager, Private Industry

Managers attending trainings improved their understanding of issues faced by workers. Participants in professional or managerial positions reported that the training increased their understanding of the hazards “the average worker” faced.

I would also mention that having people that are not directly in waste attend makes them have a little more respect for the people that are doing this kind of work, and to see what they’re trying to do and what their jobs entail. — Mark,
Hazardous Material Program Director, University

By taking a Hazwoper course I’ve got a better understanding of what the baseline knowledge is for the average worker, as well as the type of situations they would run into within that environment. — Thad, Health Physicist

Training workers and managers from the same organization together provided multiple benefits, including the perceived benefits of sharing a common language, base of knowledge, and training experience.

I have two guys that work in my department that come to this class. We have some confined spaces that every couple of months we have to go in, and I don’t have to be there as much to make sure that they have on their respirators and [the] safety guys standing outside and stuff. They know what the regulations are. As things change, they tell me what they need to do. And I know what the regulations are, so I know what they’re asking about also, so we kind of keep a check on each other. — Nora, Machinist Supervisor, University

Now even a lot of the managers have gone to this training and they can’t claim ignorance. In a way, as a supervisor, it lightens my responsibility — not responsibility — my liability, because they now know what they are supposed to provide the workers. — Paul, Inspection Supervisor, Local Government

Management, they said ‘No, you guys don’t need first aid training.’ . . . We said ‘No, remember in the training, in Hazwoper, we saw how we need to provide this and its the law, remember that?’ There was no denying they did not see the requirement, because they were in that class. — Roger, Supervising Hazardous materials Specialist, Local Government

My manager actually is qualified to teach this course. And he chooses to send us here and come here himself. So that says a lot for [him] and having managers attend training and the perceived benefit. — Lewis, Environmental Health and Safety Technician, University

3. Workplace commitment to health and safety needs

Focus group participants pointed to the crucial role that workplaces that are committed to worker health and safety played in participants’ ability to identify and enact changes. Participants especially identified the support provided by established mechanisms for raising and resolving concerns and commitment to ongoing training of workers.

Supportive managers who do the right thing were described by some focus group participants. They offered examples of these supervisors and managers initiating and supporting workplace health and safety improvements. Safety and health is valued in these settings and was described as a team effort.

I know of facilities where from my own experience with the individuals they would do something because it’s the right thing to do no matter what the cost is. If there was a way of doing it, and regardless of whether it was legally required or not. — Thad, Health Physicist

The one [worker] that has lots of training already becomes a point of reference, not only for the workers, but also for the bosses. The boss comes often to ask, ‘What do you think of this? Or that?’ Then, working as a team takes place with the basis that we have obtained training and knowledge. — Diego, Plater/Hazardous Materials Worker, Metal Plating Industry

Ongoing mechanisms to address safety and health issues were instituted within a number of workplaces. Evaluation participants described health and safety committees, an anonymous suggestion box system, and ongoing employee training .

The came up with a procedure where an employee can make a suggestion or basically a complaint, that this is the way we're doing it and it's wrong and somebody's going to get hurt. — Roger, Supervising Hazardous Materials specialist, Local Government

4. Ongoing availability of CAC training programs and program staff....

Workers and managers across focus groups identified the ongoing presence and availability of CAC training programs as crucial supports for their efforts to make workplaces safer and healthier...

Annual refreshers help to keep health and safety issues alive by providing an opportunity to re-assess health and safety priorities and re-initiate stalled or failed efforts for improvements according to focus group respondents.

The good thing is that since we have this training on an annual basis, it's like an annual reminder, 'You got to do something.' So it's kind of like documenting annually, you got to do this, you got to do this. They've said it to you. Like now we've had the 9th annual training and we still haven't done this. So it's kind of like an annual reminder, you got to keep on doing it. These yearly things (refresher trainings) remind management. — Paul, Inspection Supervisor, Local Government

Program instructors serve as ongoing resource to participants about technical information, strategies about how to seek changes, and referral to other organizations and agencies explained the focus group interviewees. People in each focus group described instances where they had sought and received valuable assistance from program instructors subsequent to CAC training.

I know that if I do have a question about a chemical or something else as well, can call up here [to the CAC Program] and get an answer so that I'm more able to deal with it. That has helped a lot. — David, Insulator, Union Contractor

The contacts that I have made through the class earlier had helped me in my job...I know who to call and it really cuts through, you know. — Brad, Geologist, Consulting Firm

V. Barriers to Health and Safety Changes

Focus group participants identified recurrent barriers to change. Both workers and professionals identified the following as key factors that impeded health and safety changes:

1. Economic pressures to cut costs and increase productivity
2. Key decision-makers' lack of familiarity with health and safety and OSHA regulations
3. Employers acting to minimize or avoid their legal liability, rather than to improve health and safety
4. Lack of workplace mechanisms for addressing or following up health and safety issues
5. Inadequacies of OSHA regulations to back preferred health and safety practices

1. Economic pressures to cut costs and increase productivity

Participants noted that many employers will support health and safety changes if costs are low and the safety and health improvement does not interfere with production. They noted however, that when employers have to choose between safety and service delivery or production schedules, safety and health changes are unlikely to be prioritized.

Unfortunately, in a time of limited resources, . . . you get an overriding concern for operational needs at the expense of, say, some of the priorities that aren't money makers.

In other words, if you've got a choice between sending a man to a safety committee meeting or sending him out in the field to do some work, no choice, you send him out in the field. . . . And that's a constant battle we've had with our top management there. They seem to feel that safety is very important as long as it doesn't interfere with production. But when you have a choice, that's wherein the problem lies.— Laura, Materials Associate, Local Government

There are other individuals where they don't care what the law says. [They say] 'If it's going to impede my work production or my research or whatever, I don't want to hear about it'. — Thad, Health Physicist

We have a few brand new fans, but since they (the employer) are thinking of moving to another location, the fans have not yet been installed. They don't want to spend on installations if they are going to have to move again and spend more money. — Metal Plating Industry Employee

[The barriers] are money, supplies, equipment. It's a lot easier to move a ladder up to a remote site than it is a scaffold . . . [And] sometimes in large projects it's you know possible but not economically feasible to the client . . . Jack, Project Engineer, Consulting Business

2. Key decision makers often not aware of health and safety regulations

Both workers and managers across focus groups noted that key decision makers often are not familiar with health and safety regulations. For example, they indicated that people who have to make budget decisions are frequently removed from daily work practices and lack a health and safety understanding. Another key group identified was “old school” managers and supervisors.

I think one of the barriers is possibly having to overcome preconceived ideas that people in management may have about what constitutes safe work practices or what level of safety is sufficient. And I think some of these ideas may be based on outdated information...I think it harkens back to....getting more levels of management involved in actually taking the classes and seeing for themselves what is appropriate and what may not be. I think that would help to overcome those barriers,... attitudes and ideas by having more information disseminated to the people in decision making capacities. — Laura, Materials Associate, Local Government

How far up it goes, where the people are making decisions as to whether to allocate funds . . . , I believe those are the people who should go because they're

sitting down trying to allocate funds to what particular unit. — Kevin, Drill Rig Operator, Local Government

You just want to just ring their neck out or something, because you've just listened to how you have to get... a permit for treatment to put it down to a base ...But you have to listen to that type of argument. Because they did it 17 years ago or they're the manager. And you're like, 'Why don't you just take this course and learn what the new regulations are?' — Maria, Environmental Management, State Government

3. Employers make changes only to reduce their legal liability

Workers and mid-level managers and professionals across focus groups described instances where safety changes have occurred “on the books” to reduce employers' legal liability, but have not been enacted in ways participants believed would really improve health and safety in their workplaces.

It [the training] really hasn't affected our bosses. It makes no difference. With this program that they are giving us, they are washing their hands, only because [it] is required by OSHA. Otherwise, they wouldn't have sent us to the program. — Tomas, Machine Operator, Metal Plating Industry

One of the disadvantages I see with the training though is that the management will use it as a CYA. Okay, they've got all these little pre policies set up where everything looks . . . nice and, you know, we paid money to have you trained. But whether it's the inspectors or the guys in the yard, there's the push, 'Well, why aren't you doing more numbers? Why [don't] you just run in and take the sample?' And so then if something happens or screws up, they go, 'I've trained them, you know, I can't be with them every day'. — Neil, Site Mitigation Regulator, Local Government

Several workers reported that it often takes a significant injury for on the ground health and safety changes to occur – and that these changes, too, are often designed to meet employers' liability concerns and not workers' safety needs. The following exchange illustrates this pattern:

I have given some [suggestions to my boss] and they haven't listened to me. Until there is an accident. Then is when they do listen. Once a guy got his finger cut off because he

was carrying something heavy. After that they made us sign a paper saying that we can only carry up to 25 lbs. If we lift any part weighing 50 lbs, and something happens, that is our responsibility. — Metal Plating Industry Employee

They did this to protect themselves and leave the responsibility to us. — Other Metal Plating Industry Employees, talking simultaneously in agreement

Ironically, employers' fear of liability has also prevented the implementation of some health and safety changes.

We've been working on an emergency response chlorine plan, but no-one signs off. There's no commitment. We'd like to have it, but no-one wants to take the liability. — Charlie, Waste Water Operator, Local Government

From the medical director's standpoint, they didn't want to expose the organization to any liability by actually admitting that these people were required to wear respirators. — Laura, Materials Associate, Local Government

4. Lack of workplace systems for addressing or following up issues

Workers and supervisors noted that lack of workplace systems for raising health and safety concerns posed a significant barrier to initiating health and safety changes. Focus group participants also ran into barriers in workplaces where there was no clear accountability for following up on raised concerns.

If you make a request, it has to go through a series of levels of management and it's passed by a number of people's desks and maybe it sits there for a year or six months. — Paul, Inspection Supervisor, Local Government

I know there's a deficiency where I work now. There is no safety committee that reviews anything or takes any action to correct. There is just no avenue for people to suggest [changes]. — Steven, Geologist, Consulting Firm Employee

5. If OSHA does not require it, there is no basis for health and safety changes

Based on CAC training that they received, workers and professionals asked for health and safety changes they believe would best improve their health and safety. However, focus group participants reported much difficulty winning any changes that exceeded OSHA regulations.

The law does not require the company to have showers for us to wash off. That's why we cannot insist in asking for the showers. We don't have the base to do it.
— Diego, Plater/Hazardous Material Worker, Metal Plating Industry

The employees know that [the job has not been made as safe as it could be] because they've been trained here [by the CAC]. And the contractor gets told that we are doing it a legal way, not a preferred way, but [it's] the legal [way] and most economical for their benefit. — Jack, Project Engineer, Consulting Business

VI. Training Conducted for Spanish Speakers

Findings from participants of the focus groups conducted for native Spanish speakers were included in the previous section's analysis of the overall findings. This section describes themes that appeared uniquely among the two focus groups conducted for native Spanish speakers.

As was mentioned previously, there were significant differences between these two focus groups. In one case the employer required that the focus group be conducted in English. Moreover, the participants in one focus group had been trained to be trainers; some of the actions they reported are specific to that role. With only two focus groups for native Spanish speakers, these differences make an extensive in-depth analysis of these two groups unfeasible.

However, both focus groups identified the vital role that native Spanish speakers played in sharing information with Spanish speaking co-workers. As a result of these limitations, though, other than the “workers trust co-workers” theme, the balance of what is reported here is from the worker trainer focus group discussion and are reported for that group alone.

Workers trust co-workers

While participants across focus groups reported informally sharing what they learned with others, participants in the focus groups for native Spanish speakers reported more instances of showing their coworkers safe work practices and of serving as important sources of health and safety information.

Now, most of the time, the workers come to us to ask, how to improve

the situation, or simply if such filters can be used with such and such

chemicals. They have enough trust in us to come and ask us. I think [this] is good. — Xavier, Plater/Hazardous Materials Worker

Many times there are buckets with certain chemicals, and my coworkers ask me where can they be placed. Depending on the chemical, I tell them where and how to dispose of those chemicals. — Luis, Waste Water Operator

Sometimes people want to know something about a chemical, what its effect is. . . . So I sometimes go, okay, come and see, and they saw the papers or whatever. — Juan, Chemical Analysis Assistant

Then, I also deal with the others coworkers and those who don't know me. They

observe me and keep on. They trust me more than going to tell a boss. — Felipe, Water Treatment Technician

A new person. Sometimes he don't know and I start to explain be careful because sometimes that person didn't go to the training, but you know you have experience already and can tell the person. —Manuel, Hazardous Waste Operator

Need for more trainings conducted in Spanish

Trainees expressed a great need for more health and safety classes in Spanish. They reported significant improvements in the health and safety awareness among their Spanish speaking co-workers who had taken the class.

Hispanic people did not have the information, I saw the difference after they received the training — Metal Plating Worker

It has helped a lot. In reality the majority of people don't get trained and they don't understand, and with the training we know what to do in case the boss abuses us. One has to know what to do, how to act in case[s] of abuse, and [how to] follow the MSDS. — Diego, Plater/Hazardous Materials Worker

Workers and managers find Spanish training materials relevant, easy to use

The focus group that had participants who had been trained to be trainers discussed the importance of the materials shared with them by the Consortium. They felt that the program's training materials were to the point, presented clearly, and well-received by their co-workers. In addition, participants reported sharing these materials with their supervisors and managers to aid with other workplace training efforts. Participants indicated that their supervisors and managers valued and used these materials as well.

I've also used the materials I was given in [the training]. Based on that I was able to help my co-workers, so they know what they are working with In the training, they give good materials and it is so simple it stays in people's minds. — Diego, Plater/Hazardous Materials Worker

When our boss had conducted a general training, we gave her materials from the training that we had attended. And she really liked them. Twice she has asked us for materials. It is easy to understand and people like it. — Xavier, Plater/Hazardous Materials Worker

Worker trainers relied upon as health and safety resource by “higher-ups”

In addition to using training materials and providing workplace health and safety training, worker trainer focus group participants indicated that they had become health and safety resource people for supervisors and managers. In one conversation, participants described this process as follows:

The one that has lots of training becomes a point of reference not only for the workers but also for the bosses — Diego, Plater/Hazardous Materials Specialist

My situation is similar. . . My boss has been working there about four months and always asks for my opinion. — Focus Group Participant

Other participants reported similar patterns:

They (supervisors and managers) depend on our knowledge. We are their reference. — Focus Group Participant....

In my company, they prepared two people, so that they conduct a safety training each month... By training those two, they train the "higher ups" (the bosses). They just finished the training and want to keep doing it. — Felipe, Water Treatment Technician

Availability of Spanish language MSDS Sheets varies

Participants in the worker-trainer focus group reported that some of their workplaces had MSDS sheets in Spanish. In these workplaces, Spanish MSDS sheets had been obtained either directly from manufacturers in Spanish, or had been received in English and then translated into Spanish by the employer. Other workplaces had no Spanish MSDS sheets and have had to rely on ad hoc translation, such as at a yearly meeting with a bilingual supervisor.

When we get a new chemical, and the MSDS doesn't arrive, they ask the same [chemical] company to send it. If they send it in English, they have it translated. — Luis, Waste Water Operator

They (the MSDS sheets) are not in Spanish . . . Every year we are asked to do [a health and safety meeting in Spanish] in the whole plant, about its hazardous areas, [and] about the MSDSs. — Focus Group Participant

CONCLUSIONS AND RECOMMENDATIONS

To conclude, we return to the evaluation questions and examine them one at a time.

1) How has CAC's Hazardous Waste Worker Training Program influenced health and safety awareness, actions, and practices back in the workplace of training participants?

Focus group participants attributed significant changes in their awareness, perceptions, thinking and analysis about health and safety, as well as improvements in workplace systems, work practices and emergency response to CAC training experiences.

Participants described a wide range of improved, upgraded and changed health and safety practices and procedures in their work environments. They reported that their learning about the principles and practices of occupational health in regards to hazardous materials and emergency response was extremely useful, valuable and applicable to their work.

Participants further emphasized that knowledge about worker rights and OSHA standards were exceptionally useful when combined with the hazardous materials and emergency response information provided in trainings. They cited numerous examples of improved readiness and response to hazardous materials emergencies, including written plans that specified response levels for different workers.

The impact of CAC's training was reported to be far wider than its course registration would indicate. Focus group participants revealed that they disseminated the courses' content, written materials and learnings through informal networks at their workplace, as well as with friends and family members employed elsewhere. Those focus group participants who train or educate others as part of their jobs indicated that not only have they included course content, but that they have also adopted Consortium training methods and techniques to hone their own training.

Spanish speaking workers who participated in CAC's Spanish language training program portrayed these courses as a beacon. Focus group participants indicated a paucity of Spanish language health and safety training courses and materials. Participants indicated that they thought Spanish speaking workers sought out information from their Spanish speaking co-workers because they trusted each other. In addition to conducting training back at their workplaces, participants noted that they were now also consulted by other workers and even managers as resource people.

2) What key factors did participants identify as supports and barriers to these actions?

Throughout the myriad workplace systems, procedural and work practice changes described in the data runs a strong bold thread about the significance of linking health and safety recommendations to OSHA regulations. OSHA regulations were viewed as a key source for people in technical, supervisory and managerial positions as well as frontline workers. This was evidenced in discussions about MSDS sheets, confined space policies, respirator use, medical surveillance and emergency response. The knowledge about OSHA regulations and workers' rights seemed to serve as a guide to those who had power to make changes, those making suggestions regarding improvements, and those advocating for improvements with recalcitrant employers. The combination of knowledge of health and safety including occupational health and emergency response and of legal rights and regulations seemed to engender confidence and support in those seeking the improvements.

Focus group participants who work in government, manufacturing, universities, construction, and environmental clean-up indicated that a 'community' of CAC learners and worksites exists. Sometimes this was in evidence when a numbers of employees from the same worksite or employer had been trained. Other times it was visible regarding the relationships of participants to each other given their shared CAC training experiences, and at other times it was seen among members of the same union who have participated in CAC training.

Some participants had ongoing relationships with CAC training staff and programs, and have attended trainings and refresher programs for sometimes up to a decade. They described how 'speaking the same language' and having a shared framework of CAC's health and safety contributed to these changes. Furthermore, they described their CAC training as going beyond the classroom and extending into an ongoing relationship with CAC staff members. CAC training providers seem to serve as an ongoing information and referral back-up resource for those in the CAC training community.

The most significant barriers to making health and safety improvements named by focus group participants was the conflict between economic pressures to maximize service or production output with fewer people and investing resources, both economic and human, in health and safety; and key decision makers in organizations who may not appreciate the occupational health issues facing their workforce.

3) How can the CAC better meet participants' health and safety training needs?

Specific recommendations have been made regarding individual CAC members in program reports which were sent directly to each program and to the CAC Principal Investigator. Here we turn our attention to recommendations for the Consortium as a whole. These recommendations are as follows:

1. Keep the focus on legal rights and regulations, informed by a more expanded understanding of the significance of the training sections that address legal rights and regulations for CAC participants. Include updated information about OSHA cases pending development of new standards, and provide references to internet sites containing OSHA regulations and other related materials.

2. Foster additional opportunities to train multiple workers from the same worksite. The Consortium could consider offering contract or open enrollment classes targeted toward one to three employers with a particular focus (e.g., waste water treatment facilities, metal plating facilities, or university laboratories). These classes might be marketed through partnerships with trade or professional associations (i.e., the League of Municipalities or the Water Safety Professional Association). Another option for open enrollment classes would be to offer discounts for multiple attendees from the same employer. For example, the first three attendees pay full, with each additional person at a reduced fee.

3. Initiate a mini-needs assessment to determine how to train decision makers at higher levels of management than usually participate in CAC training.

Involve select CAC training participants to assist in developing a strategy to assess how to involve, educate, or train key decision-makers in CAC's constituency. Based on the input of CAC training participants and others they help access for CAC, consider a range of options for educating decision makers. These may include: a half day session in person via satellite or on the internet that is designed specifically for these decision makers; targeted materials highlighting key items decision makers need to know about liability regarding 1910.120 and other specially designed efforts. We would recommend conducting the mini-assessment in this grant year so that it could inform a pilot program in the future.

4. Develop a multi-faceted evaluation strategy that meets the needs of all Consortium members for the future.

Recognizing that the CAC includes members with a wide range of approaches and philosophies, any future evaluation strategy should be compatible with each member's needs. Each organization should determine their main evaluation interests. For example, programs training worker or peer trainers may want to learn more from managers about the usefulness and benefits of such programs in future evaluations. Programs offering many refresher courses may want to know more about the use of course information in the year prior to the refresher; a short written questionnaire could be designed to gather this information. We would encourage that philosophical difference should be addressed prior to committing to an evaluation plan. Once evaluation priorities are identified, a coordinated strategy can be crafted.

APPENDIX A: FOCUS GROUP DISCUSSION GUIDE

General Guide

General Guide (Spanish Translation)

ASU Guide

GENERAL

FOCUS GROUP INTERVIEW GUIDE

Time: Estimate for the focus group itself is 1 and ½ hours. We will tell participants 2 hours to allow for getting snacks, filling out paperwork, and late comers.

I. WELCOME AND GETTING STARTED (10 minutes)

1. Welcome. Facilitators introduce ourselves and welcome everyone. We really appreciate your efforts to attend. Enjoy some refreshments while I tell you about what we're going to do.
2. Project Description. We are conducting an evaluation to assess the effectiveness of the [organization's, e.g. LOHP's] hazardous waste operations and emergency response training program for you once you return to your workplace.

We will be conducting groups like this with workers from different sites in California, Arizona and Alaska where these courses are offered.

The information will be used to improve our training and to report the effectiveness of the program to the funding source, the National Institute of Environmental and Health Sciences.

3. How It Will Work. This interview is like a group conversation. We are interested in your experiences, ideas and opinions. Please feel free to talk and share openly. There are no "right" or "wrong" ideas or answers. We want to hear from everyone and expect you may not agree with each other. Feel free to disagree but please do so respectfully. We want to hear **all** the different points of view and experiences and are very interested in **all** your opinions.
4. Recording and Confidentiality. Everything that you say in this room is confidential. Your identity will not be linked to what you say. (Refer to written permission). Please respect each other's confidentiality by not repeating what anyone says in the group today.

With your permission, we will tape record this session.

Later we will have the conversation typed up. Please say your name each time before you speak to help the person typing up this conversation distinguish when speakers change. You can use your real name or if you are more comfortable you can make up a name to use during the interview. Your name will not appear in the typed document. Please speak up so that your voice will be recorded and speak one at a time.

5. Introductions. Let's go around the table and introduce ourselves. Tell us your name, your employer, your job, how long you've worked there, and a little bit about how you use or come in contact with hazardous materials or waste.

II. GROUP DISCUSSION (70 minutes)

1. Hazardous Materials Awareness

How has the way you think about your work with hazardous materials changed since the training?

Probes:

1. How has the training impacted your awareness of hazardous materials?
2. If other people you work with were also trained, how did the training improve the awareness of people at work about hazardous materials in your workplace?
3. How has the information you learned helped you recognize hazardous situations?
4. In what ways have you used the information you learned about environmental regulations and OSHA standards?

2. Work Practices

How have you changed how you do your work since the training? We are thinking about work practices like how and when you use safety or personal protective equipment, store chemicals and other things like this.

Probes:

1. In what ways have you changed how you approach or assess your health and safety in your everyday work?
2. How have you changed the way you use PPE? Frequency, method, situation?
3. What about the training made you change the way you do your work?

3. Raised Concerns

Have you or any of your coworkers who went to the training made suggestions or raised concerns or recommended any new safety procedures at your job because of the training?

Probes:

1. Describe the issue, who you talked with, and what happened.
2. Were you successful in making changes? Describe changes (policies, plans, equipment, PPE, etc).

3. Are there any suggestions you've made or concerns you have tried to do something about but the needed changes haven't been made.
4. What are the barriers to getting these changes made?
5. What differences have you noticed about making changes when the improvement requires spending money?

4. Employer Actions & Attitudes

How has the training affected your employer's health and safety program?

Probes:

1. Describe any policies or plans that have been revised or created that you think is a result of your employer's involvement in the training.
2. Describe changes in processes that have been made or new equipment that has been purchased that you think is a result of your employer's involvement in the training.
3. Describe your employer's attitudes toward health and safety on the job?
4. What shapes those attitudes?
5. What do you think could change their attitudes?
6. How has their attitude towards health and safety changed since the training?

5. Emergency Response

In what ways have you changed how you approach or assess situations that might be emergencies?

Probes:

1. Describe any incidents or close calls that were prevented or averted because of information from the training.
2. Describe any incidents or close calls involving hazardous substances that have happened on your job since you first attended the training.
3. How did the training help you respond to the incident or close call?

4. If others from your workplace were also trained, how did the training help them respond to the incident or close call?

6. Use of Training Materials

How have you used the training and reference materials back on your job?

Probes:

1. Describe how you used the training materials as a reference.
2. How have you used the training materials to help do your own work more safely?
3. Describe how you shared materials and resources with other workers or managers.
4. Have you or anyone else that you are aware of used the training materials to conduct internal trainings at your facility?
5. How useful were the materials used in the training?
6. How could the training materials be improved?

7. How to Improve Training

What ideas or suggestions do you have that can make this training program more useful for participants like you when they get back to work?

Probes:

1. What health and safety topics or situations on the job would you like more training about?

III. CLOSING (10 minutes)

Are there any other opinions, or ideas you'd like to say before we close?

Thank for your participation. Your comments will be used to help the [your organization] improve its training.

Guía de enfoque de la entrevista (del grupo)

Duración: Se estima 1:30 horas para la discusión y enfoque del grupo. Les diremos a los participantes que serán dos horas, para darles tiempo a que coman algo y llenen las formas, y poder esperar por las personas que lleguen tarde.

I. BIENVENIDA Y COMIENZO (10 minutos)

1. Bienvenida. Los dirigentes se presentarán y darán la bienvenida a todos. Agradecemos sus esfuerzos para venir a esta entrevista. Disfruten los refrescos mientras les hablo acerca de lo que vamos hacer.

2. Descripción del proyecto. Estamos conduciendo una evaluación para saber la efectividad -una vez que usted haya regresado a su trabajo- del programa de entrenamiento de (nombre de la organización, e.g. LOHP) sobre operaciones de desperdicios peligrosos y respuesta a emergencias.

Tendremos discusiones como esta con trabajadores de diferentes sitios, en California, Arizona y Alaska, donde se ofrecen estos cursos.

La información será usada para mejorar nuestros entrenamientos y para reportar la efectividad del programa a la organización patrocinadora, el Instituto de Ciencias del Medio Ambiente y la Salud.

3. Forma en que se hará. Esta entrevista es como una conversación en grupo. Tenemos mucho interés en saber sus experiencias, sus ideas y opiniones. Siéntase confortable para poder hablar y compartir sus experiencias abiertamente. No hay preguntas ni respuestas “correctas” o “equivocadas,” sólo queremos oír a cada uno de ustedes y no esperamos que todos estén de acuerdo, unos con los otros. Si no están de acuerdo con algo, queremos que se sientan libres de expresar sus opiniones, pero esperamos que lo hagan de una manera respetuosa. Estamos muy interesados en oír todos los diferentes puntos de vista y opiniones de todos ustedes.

4. Grabación y Confidencialidad. Todo lo que se hable en esta discusión es confidencial. Su identidad no se ligará a lo que usted diga. (Refiérase al permiso escrito). Les pedimos que por favor respeten la confidencialidad de los otros y no repitan lo que se hable hoy, en esta discusión.

Con su permiso grabaremos la discusión de esta sesión.

Más tarde haremos escribir a máquina la conversación. Por favor, diga su nombre cada vez antes de empezar hablar, esto ayudará a la persona que está copiando la conversación para saber cuando cambia la persona que está hablando. Usted puede usar su propio nombre o si prefiere puede usar otro nombre durante la entrevista; su nombre no aparecerá en el documento escrito. Por favor hablen, uno por uno -a la vez- y en voz alta para la grabación.

5. **Presentación.** Vayamos alrededor de las mesas para presentarnos. Díganos su nombre, quien es su patrón, cuál es su trabajo, cuanto tiempo tiene de trabajar ahí, y brevemente como fue que usted llegó a tener contacto con materiales o desperdicios peligrosos.

II. DISCUSIÓN DEL GRUPO (70 minutos)

1. **Alerta Sobre Materiales Peligrosos.** Después del entrenamiento ¿cómo ha cambiado su manera de pensar acerca de su trabajo con materiales peligrosos?

a. ¿Cómo el entrenamiento a impactado su conocimiento y lo ha alertado sobre los materiales peligrosos?

b. Si otras personas que trabajan con usted han sido entrenadas, ¿cómo han sido alertados y mejorado el conocimiento sobre los materiales peligrosos en su lugar de trabajo?

c. ¿En que forma le ha ayudado, la información obtenida, a reconocer las situaciones peligrosas?

d. ¿De que manera ha usado lo aprendido sobre regulaciones del medio ambiente y los estándares de OSHA?

2. **Prácticas de trabajo.** Después del entrenamiento ¿Cómo ha cambiado usted la forma en que hace su trabajo? Estamos pensando en prácticas de trabajo, tales, como y cuando usted usa equipo de seguridad , o equipo de protección personal, la forma de almacenar sustancias químicas, y otras cosas como estas.

a. ¿Qué cambios ha hecho usted en la forma en que aborda (enfrenta) o evalúa diariamente su salud y seguridad en el trabajo?

b. ¿Ha cambiado usted la forma en que usa el equipo de protección personal? ¿Frecuencia, método o situación?

c. ¿De que manera, el entrenamiento ha hecho que usted cambie la manera de hacer su trabajo?

3. **Preocupaciones..** Pídale a uno de sus compañeros de trabajo, que haya atendido el entrenamiento, (o usted puede hacerlo) que haga sugerencias, que hable de sus preocupaciones sobre el trabajo, o que recomiende cualquier procedimiento nuevo de seguridad en su trabajo, originado a causa del entrenamiento.

a. Describa el tema, diga con quien habló acerca de esto, y cual fue el resultado.

- b. ¿Tuvo éxito en hacer estos cambios? Describa los cambios (pólizas, plan, equipo, PPE, etc).
- c. ¿Hay algunas sugerencias que usted haya indicado, o preocupaciones que haya tenido, las cuales necesitan cambios y no han sido hechos?
- d. ¿Cuáles son las barreras que impiden estos cambios?
- e. ¿Qué diferencia ha notado usted, cuando el hacer el mejoramiento requiere el gastar más dinero?

4. **Acciones y Actitudes del Patrón.**

¿De que manera el entrenamiento ha afectado el programa de salud y seguridad del empleador?

- a. Describa cualquier póliza o plan - que usted crea- haya sido revisado o creado, como resultado de la involucración de su patrón en el entrenamiento.
- b. Describa los cambios que están en proceso, o equipo nuevo adquirido, que usted cree es resultado del involucración de su patrón en el entrenamiento.
- c. Describa cual es la actitud de su patrón acerca de la salud y seguridad en el trabajo.
- d. ¿Qué es lo que induce (produce, o motiva) esta actitud?
- e. ¿Qué cree usted que podría cambiar esta actitud del patrón?
- f. Después del entrenamiento ¿Ha cambiado la actitud del patrón acerca de la salud y seguridad en el trabajo?

5. **Respuesta a Emergencias.** ¿De qué manera ha cambiado usted, la forma en que enfrenta o evalúa las situaciones que podrían ser emergencias?

- a. Describa cualquier incidente o situación que podría haber sido un desastre, que fueron prevenidas o que hayan probado ser efectivas, de la información obtenida del entrenamiento.
- b. Describa cualquier incidente o situación que podría haber sido un desastre, que incluya sustancias peligrosas y que haya ocurrido después de haber atendido su primer entrenamiento.

c. ¿De que forma el entrenamiento, le ayudó a responder al incidente, o a lo que pudo haber sido un desastre?

d. Si otros trabajadores, en su lugar de trabajo, también fueron entrenados ¿de qué forma, el entrenamiento les ayudó a responder al incidente?

6. **Uso de los Materiales de Entrenamiento.** Al regresar a su trabajo ¿Cómo ha usado el material y las referencias del entrenamiento?

a. Describa como usa los materiales del entrenamiento, como referencia.

b. ¿Como usa los materiales del entrenamiento, para ayudarle hacer su propio trabajo, en una forma más segura?

c. Describa como usted comparte con otros trabajadores y con los supervisores, los materiales y los recursos.

d. Usted o alguien más, ha usado los materiales del entrenamiento, para conducir entrenamientos en su sitio de trabajo?

e. ¿Qué tan útiles fueron los materiales usados en el entrenamiento?

f. ¿Podrían los materiales ser mejorados?

7. **Como Mejorar el Entrenamiento.** ¿Qué ideas o sugerencias tiene, que harían el programa más útil, a los participantes -como usted- cuando regresen a su trabajo?

a. ¿Qué otros temas de salud y seguridad, o situaciones en su trabajo, en las cuales le gustaría tener más entrenamiento?

III. Cerrando la Discusión (10 minutos)

¿Tienen algunas otras opiniones, o ideas que quisieran exponer antes de cerrar la discusión?

Muchas gracias por su participación. Sus comentarios serán usados para ayudar a mejorar el entrenamiento de su compañía.

ASU

FOCUS GROUP INTERVIEW GUIDE

Time: Estimate for the focus group itself is 1 and ½ hours. We will tell participants 2 hours to allow for getting snacks, filling out paperwork, and late comers.

I. WELCOME AND GETTING STARTED (10 minutes)

6. Welcome. Facilitators introduce ourselves and welcome everyone. We really appreciate your efforts to attend. Enjoy some refreshments while I tell you about what we're going to do.
7. Project Description. We are conducting an evaluation to assess the effectiveness of ASU's hazardous waste operations and emergency response training program for you once you return to your workplace.

We will be conducting groups like this with workers from different sites in California, Arizona and Alaska where these courses are offered.

The information will be used to improve our training and to report the effectiveness of the program to the funding source, the National Institute of Environmental and Health Sciences.

8. How It Will Work. This interview is like a group conversation. We are interested in your experiences, ideas and opinions. Please feel free to talk and share openly. There are no "right" or "wrong" ideas or answers. We want to hear from everyone and expect you may not agree with each other. Feel free to disagree but please do so respectfully. We want to hear **all** the different points of view and experiences and are very interested in **all** your opinions.
9. Recording and Confidentiality. Everything that you say in this room is confidential. Your identity will not be linked to what you say. (Refer to written permission). Please respect each other's confidentiality by not repeating what anyone says in the group today.

With your permission we will take notes during this session. Later we will have the conversation typed up. Please say your name each time before you speak to help the person taking notes record when speakers change. You can use your real name or if you are more comfortable you can make up a name to use during the interview. Your name will not appear in the typed document. Please speak up so that everyone can hear you and speak one at a time.

10. Introductions. Let's go around the table and introduce ourselves. Tell us your name, your employer, your job, how long you've worked there, and a little bit about how you use or come in contact with hazardous materials or waste.

II. GROUP DISCUSSION (70 minutes)

1. Hazardous Materials Awareness

How has the way you think about your work with hazardous materials changed since the training?

Probes:

2. How has the training impacted your awareness of hazardous materials?
3. If other people you work with were also trained, how did the training improve the awareness of people at work about hazardous materials in your workplace?
4. How has the information you learned helped you recognize hazardous situations?
5. In what ways have you used the information you learned about environmental regulations and OSHA standards?

2. Work Practices

How have you changed how you do your work since the training? We are thinking about work practices like how and when you use safety or personal protective equipment, store chemicals and other things like this.

Probes:

1. In what ways have you changed how you approach or assess your health and safety in your everyday work?
2. How have you changed the way you use PPE? Frequency, method, situation?
3. How has your training helped you to understand and work with company procedures related to hazardous materials?
4. What about the training helped you change the way you do your work?

3. Emergency Response

In what ways have you changed how you approach or assess situations that might be emergencies?

Probes:

1. Describe any incidents or close calls that were prevented or averted because of information from the training.
2. Describe any incidents or close calls involving hazardous substances that have happened on your job since you first attended the training.
3. How did the training help you respond to the incident or close call?
4. If others from your workplace were also trained, how did the training help them respond to the incident or close call?

4. Use of Training Materials

How have you used the training and reference materials back on your job?

Probes:

1. Describe how you used the training materials as a reference.
2. How have you used the training materials to help do your own work more safely?
3. Describe how you shared materials and resources with other workers or managers.
4. Have you or anyone else that you are aware of used the training materials to conduct internal trainings at your facility?
5. How useful were the materials used in the training?
6. How could the training materials be improved?

5. How to Improve Training

What ideas or suggestions do you have that can make this training program more useful for participants like you when they get back to work?

Probes:

1. What health and safety topics or situations on the job would you like more training about?

III. CLOSING (10 minutes)

Are there any other opinions, or ideas you'd like to say before we close?

Thank for your participation. Your comments will be used to help ASU improve its training.

APPENDIX B: PARTICIPANT DATA SHEET

General Participant Data Sheet

General Participant Data Sheet (Spanish Translation)

ASU Participant Data Sheet

Participant Consent and General Information Form

New Perspectives Consulting Group is conducting an evaluation to assess the effectiveness of UC Berkeley's Labor and Occupational Health Project's hazardous waste and emergency response training program once people return to their workplaces. We will be asking for your opinions about how the training affected your awareness of hazardous materials and your work with them and asking for your suggestions for improving the training.

This information will be used by your training provider to improve the training and to report to the funding source, the National Institute of Environmental and Health Sciences.

What you and everyone in the group have to say is very important to us, so we would like to record this discussion on paper and on audiotape. Later the audiotape will be typed up. No one's name will appear in the typed document. We'd also like you to fill out the general information questions below. Everyone's answers on these forms will be combined and no one's name will be linked to the information.

Everything that is said in the discussion is confidential. You should not tell anyone specific things that were said by other group members during the session. During this focus group you can refuse to answer any question and you can leave the group at any time. The focus group discussion should last about one and a half hours.

If you have any questions about the focus group or the project, please ask the group leader. If you have questions later, please call Tobi Lippin of New Perspectives Consulting Group at 919-286-5995.

Please sign to indicate that you understand how the group interview process will work as described above and that you volunteer to participate in this group.

Your Signature: _____

1. Who is your employer? _____

2. How long have you worked for your current employer? _____ Years

3. What is your job title? _____

4. How long have you done this type of work? _____ Years

5. Are you ___ male or ___ female?

6. What is your race or ethnicity? (**Check one or fill in "other" category**)

___ Non-Hispanic White

___ Hispanic/Latino

___ Black/African-American

___ American Indian or Alaska Native

___ Asian or Pacific Islander

___ Other, please describe: _____

7. What is the highest grade in school you have completed? (**Circle one number or set of words**)

1 2 3 4 5 6 7 8 9 10 11 12

some college

college graduate

graduate school

8. Are you a union member?

___ Yes, Which union? _____

___ No

Thank you for filling out this form and participating in today's group!

Forma General de Información y Permiso del Participante

El Grupo de Consulta Nuevas Perspectivas, está conduciendo una evaluación para saber la efectividad del programa de entrenamiento de la Universidad de California, Los Angeles, **Proyecto de Labor y Salud Ocupacional, Sobre Desperdicios Peligrosos y Respuesta a Emergencias**, una vez que los participantes han vuelto a sus sitios de trabajo. Les preguntaremos sus opiniones, sobre como el entrenamiento les ha despertado y alertado sobre los materiales peligrosos con que trabajan. También les pediremos sus sugerencias para mejorar el entrenamiento. Esta información será usada por su entrenador para mejorar el entrenamiento y para reportar a la organización patrocinadora, el Instituto de Ciencias del Medio Ambiente y la Salud.

Lo que usted y todos los demás digan, es muy importante para nosotros, por esto nos gustaría grabar la conversación. Más tarde, esta conversación será transcrita y escrita a máquina. Ningún nombre aparecerá en el documento escrito. También queremos que contesten las preguntas generales que aparecen en esta forma. Todas las respuestas en estas formas serán puestas juntas y ningún nombre será ligado a esta información.

Todo lo que se hable en la discusión es confidencial. Usted no deberá decir nada específico -a nadie- de lo que otros miembros del grupo digan en la discusión. Durante el enfoque, usted puede rehusar a contestar cualquier pregunta, y también puede dejar la sesión en cualquier momento. La discusión durará más o menos una hora y media.

Si tiene alguna pregunta acerca del enfoque de la discusión, o acerca del proyecto, por favor pregúntele al líder del grupo. Si más tarde, aún tiene preguntas, por favor llame a Tobi Lippin, al Grupo de Consulta Nuevas Perspectivas, 919/286-5995.

Por favor firme, para indicar que entiende el proceso -indicado arriba- de como trabaja el Grupo de Consulta, y que usted decide participar voluntariamente en este grupo de discusión.

Firma: _____

1. ¿Dónde trabaja?

2. ¿Cuánto tiempo lleva trabajando ahí?

_____ años.

3. ¿Cuál es su título en el trabajo?

4. ¿Cuánto tiempo tiene haciendo este tipo de trabajo?

_____ años.

5. Usted es: Hombre: _____ Mujer:

6. Indique su raza, o condición étnica (marque uno, o llene la categoría "otra")

Blanco -no hispano: _____ Asiático o Isleño del Pacífico:

Afro/Americano: _____ Indio Americano o Nativo de Alaska: _____

Hispano/Latino: _____ Otro: (describa) _____

7. Haga un círculo indicando cual es el grado más alto, que terminó en la escuela.

1 2 3 4 5 6 7 8 9 10 11 12

¿Fue a la Universidad por algún tiempo? _____ ¿Se graduó de la Universidad?

¿Estudios de Post grado? _____

8. ¿Es usted miembro de alguna Unión? Si: _____ No: _____

Por favor de el nombre de la Unión a la que pertenece:

¡Muchas gracias por completar esta forma y por participar en la discusión de este día!

ASU Participant Consent and General Information Form

New Perspectives Consulting Group is conducting an evaluation to assess the effectiveness of Arizona State University's hazardous waste and emergency response training program once people return to their workplaces. We will be asking for your opinions about how the training affected your awareness of hazardous materials and your work with them and asking for your suggestions for improving the training. This information will be used by your training provider to improve the training and to report to the funding source, the National Institute of Environmental and Health Sciences.

What you and everyone in the group have to say is very important to us, so we would like to take notes during the conversation. Later the notes will be typed up. No one's name will appear in the typed document. We'd also like you to fill out the general information questions below. Everyone's answers on these forms will be combined and no one's name will be linked to the information.

Everything that is said in the discussion is confidential. You should not tell anyone specific things that were said by other group members during the session. During this focus group you can refuse to answer any question and you can leave the group at any time. The focus group discussion should last about one and a half hours.

If you have any questions about the focus group or the project, please ask the group leader. If you have questions later, please call Tobi Lippin of New Perspectives Consulting Group at 919-286-5995.

Please sign to indicate that you understand how the group interview process will work as described above and that you volunteer to participate in this group.

Your Signature: _____

1. Who is your employer? _____

2. How long have you worked for your current employer? _____ Years

3. What is your job title? _____

4. How long have you done this type of work? _____ Years

5. Are you ___ male or ___ female?

6. What is your race or ethnicity? (**Check one or fill in "other" category**)

___ Non-Hispanic White

___ Asian or Pacific Islander

___ Black/African-American

___ American Indian or Alaska Native

___ Hispanic/Latino _____ Other, please
describe: _____

7. What is the highest grade in school you have completed? (**Circle one number or set of words**)

1 2 3 4 5 6 7 8 9 10 11 12
some college college graduate graduate school

8. Are you a union member?

___ Yes, Which union? _____

___ No

Thank you for filling out this form and participating in today's group!

Union-Initiated Safety Training Program Leads to Improved Workplace Safety

Barbara Hilyer, M.S.P.H.

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Workplace and Environmental Safety and Health Training Program

Center for Labor Education and Research

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and

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Running Head: Union-Initiated Safety Training Program

A Union-Initiated Safety Training Program Leads to Improved Workplace Safety

Introduction

Traditional safety and health training in American industry is initiated, designed, and delivered by management, or training professionals contracted by management, and frequently is imposed upon workers, without their input, to satisfy regulatory or loss control requirements. Although the company has the legal and moral responsibility to provide a safe workplace, health and safety programs primarily are designed to protect management's interest, which may or may not coincide with workers' interests. In personal conversations with the author, workers have complained that training is held at difficult hours (for example, following a 12-hour midnight shift), is boring, and includes far too many videos with too few opportunities for questions. Often, they say, the training is not applicable to their jobs due to lack of job experience on the part of the trainer, training manual designer, or video producer.

Some workers applaud, and some denigrate, the recent rise in the development of a variety of joint labor-management cooperative programs designed to encourage their increased participation in process management, worker protection, and safety training. Having watched cooperative programs slide into obscurity in the past, some just stand by and wait to observe the outcome. Earlier writers saw the collaborative process, often initiated by management, as a company ploy to weaken union strength (Winpisinger 55); this sentiment is expressed by some unionists today, while others advance an approach that proactively incorporates unions in strategic planning (Cohen-Rosenthal 597).

A number of factors influence the acceptance of joint labor-management cooperative programs. Joint programs generally are initiated by management, with local unions deciding whether to participate. The local's acceptance and participation depend on the overall performance of the plant and the company, the history of bargaining relations, and the union's role in establishing and administering the program (Kriesky 18). Continued support is contingent on two factors: The local union must play a central, autonomous role in implementation; and workers expect discernable results (Kriesky 27). When leaders of unions agree to adopt a cooperative program, often individual workers, factions, or even entire local unions resist the cooperative program (Johnson 27). In a study of five joint

training programs, the union's ability to maintain a strong role in planning and implementation significantly influenced training outcomes (Hugentobler 37, Robins 144).

Safety training programs initiated by unions have gained strength and numbers over the past ten years. Under the aegis of the National Institute of Environmental Health Sciences (NIEHS) Hazardous Waste Worker Training Grant program, unions have developed cadres of worker-trainers who can be called upon to train both workers and managers in their craft or industry. In addition to the program described in this paper, successful peer training programs are in place in a number of unions. In meetings and trainers' conferences sponsored by the NIEHS, developers of these programs have shared successful training techniques and have convened to write guidelines for effective worker-based safety and health training. The United States Occupational Safety and Health Administration (OSHA) published the guidelines as an appendix to 29 CFR 1910.120.

Through broad-based educational programs, NIEHS grantees and other trainers have sought to empower workers so they can be agents of workplace change (Wallerstein 309, Zohar 98); this approach is embraced by university labor centers as well as labor unions. The process of building partnerships between employers and employees on health and safety issues has been successful in companies that welcomed this new activism by workers (Deutsch 69).

Peer trainers play a major role in the new partnerships, as management learns how effectively workers function as trainers who speak directly to worker interests. The plant manager of a paper facility where workers have trained over 6,000 hourly and salaried employees said, "It's easy for management to dream up approaches for such training, but the problem becomes how to get it institutionalized. Any employee-driven program tends to come across with credibility, thus acceptance and effectiveness" (Turner 9).

Background

The partners in the union-based training program described here sought to measure the improvement in workplace safety with a post-training survey of participants. Partners in the joint program are the

United Paperworkers International Union (UPIU), representing approximately 240,000 members; the University of Alabama at Birmingham (UAB) Center for Labor Education and Research (CLEAR); and a number of companies whose cooperation was sought by the union to facilitate peer training by UPIU members. The UPIU arranged two-day classes each year in each of its eleven geographic regions. Classes were developed and taught by instructors at UAB/CLEAR and funded by a grant from the NIEHS. After the first year, attendees invited their management counterparts to accompany them to classes when this was desirable. In many cases, companies supported travel and paid lost time wages for class participants. Company cooperation in training support and workplace peer training occurred at the local, rather than the corporate level, and included local divisions of Georgia Pacific, International Paper, Weyerhaeuser, Union Camp, Stone Container, Potlatch, and others. Boyd Young, President of the UPIU, states:

I am a strong advocate for peer training programs, especially in the areas of safety and health in the workplace. I am especially proud of the UPIU/UAB Hazmat Train-the-Trainer peer training program. The UPIU member-trainers have been doing an excellent job of presenting training across the country, and they not only teach but also design the training materials. It is important to have people training our members who know the job as only our members know it. With this program, our peer trainers already have the respect and attention of the workers they train.

Curriculum and Goals

The designers of the program set forth two goals. Each participant would be trained to the First Responder Awareness Level as described in OSHA Standard 29 CFR 1910.120(q) (i), training that essentially duplicates OSHA-mandated Hazard Communication Standard training that employers must provide to all employees who work with or around hazardous chemicals. This curriculum acquaints workers with chemical hazard recognition and protection measures. Secondly, the training program would result in the placement in each local union, workplace, or geographic region a cadre of peer trainers who would train others to the same level and would work to recognize and remediate

hazardous working conditions. To facilitate the second goal, the classes fostered participants' abilities to solve problems and devise strategies to improve health and safety conditions in the workplace.

The curriculum included topics required for certification under the OSHA standard described above, as well as information about adult learners and practice with effective methods for training them. Participatory methods were used throughout the classes, and trainees were encouraged to choose participatory methods when they trained. CLEAR made available to member-trainers a catalog of training materials for a variety of health and safety topics and supported their onsite training efforts through telephone contact and a quarterly newsletter. "Super Trainer" classes, providing three days of training theory and practice, were held at the end of the instructional year. As in the hazmat classes, participatory methods were stressed; in fact, during the three-day Super Trainer course, lecture was used as a training method for a total of only twenty minutes.

Difficulties in Measuring Outcomes

Safety and health training programs for workers are conducted at an annual cost in the U.S. of more than \$40 billion (Lee 41), while attempts to quantify the workplace effectiveness of the training continue to frustrate companies and training providers (Ford 247). The evaluation of worker training programs has focused primarily on process measures (what happens in the class) since these are relatively easy to measure. They include assessments of trainee satisfaction with the training (utilizing a scaled form or comment sheet), knowledge gain (frequently through pre- and post-tests or simply end-of-course exams), increases in positive attitudes regarding safety (worker self-report on completion of training), and instructor assessment of trainees' specific skills and hands-on procedures (Veasey 2). Forty-eight studies analyzed by Johnston (147-158) utilized assessments of changes in knowledge, attitude, and behavior as measures of training effectiveness. Many training providers have compiled cases of successful applications of knowledge; anecdotal evidence of improved spill preparedness and response and the avoidance of unsafe situations abounds (Manwaring 162, Ruttenberg 7-12, Kaminski

7-8, Weidner 4-5). Post-training outcomes have been studied as well, through surveys and interviews with participants (Brown 746). In a post-training survey to evaluate the long term effects of training, respondents reported significant use of written resource materials introduced during training; success in fostering improvements in company programs, practices, and equipment; and improved preparedness for and response to chemical spills (McQuiston 1315-1323). All these measures can be considered surrogate markers of injury prevention.

While there is no doubt that the primary goal of providing workers with training is to improve safety and health in the workplace, the impact of training in this regard has been the most difficult outcome to measure for a variety of reasons (Gotsch 185, Israel 374, Luskin 673). Improved workplace safety has been associated with an increase in observed “safe acts” behavior by workers, a decrease in reported accidents and injuries, decreased sick leave, decreased MSHA violations, and a reduced financial outlay for lost time injuries and medical treatment (Fellner 18, Parenmark 145, Smith 10-13). Because a number of synergistic factors impact all these outcomes, it is impossible to demonstrate a cause-effect relationship due solely to training. It has even been suggested that utilizing accident and injury rates as measures of improved workplace conditions can be deceptive, since some safety promotion efforts involving rewards result in under-reporting of accidents (Merrill 350).

Process measures indicated the UPIU classes were successful in achieving the stated goals. Performance-based learning objectives were met, as evaluated through performance checklists, questionnaires, and verbal reports. Trainee satisfaction was high, as measured by course evaluations. Follow-up calls and written requests for information indicated that UPIU member-trainers trained large numbers of others in their workplaces and local union halls. The question still remained “Does this training lead to an improvement in workplace safety?” This article reports the results of a participant survey that attempts to answer the question.

Method

The survey consisted of 16 questions with multiple choice qualitative answers, with a line for explanatory comments following each question. It was designed to determine if positive changes in workplace safety had occurred with respect to focus topics of the training and, if it had, to what extent the trainees had influenced the changes. Each question or answer included the phrase “since the training.” The questions were tested with a small group of workers and revised for clarity. The survey was mailed to 300 workers randomly selected from a list of 582 worker trainees, and to all 37 managers who had participated in the training. Each worker survey was accompanied by a letter from the international president of the UPIU encouraging members to respond, while the managers received explanatory letters from the university’s program director. Each return envelope was uniquely numbered and follow-up mailings were sent to nonrespondents. Three mailings resulted in a response rate of 48.4 percent from workers and 53.5 percent from managers. It is possible that those who were more enthusiastic about the training and for whom it has had a lasting effect were more likely to respond than those who have had little opportunity to apply it; therefore, the possibility of bias in the respondents compared to the sample should be recognized.

A data identification number was assigned to each completed survey; it was used for data analysis purposes and did not correspond to respondents’ identities. Responses to each question were coded and frequencies of responses compiled. The final data analysis was performed by combining the responses obtained from all three rounds of the survey. The responses obtained from the managers were analyzed separately using the

same methods as those used for the worker survey. Any additional comments provided were listed by data identification numbers and survey question numbers. The additional comments were subjected to content analysis for any emergent themes that were relevant to the survey. Content analysis of the comments was important to an understanding of the relationship between training and the impact, or lack of impact, on workplace safety.

Results

Frequency Analysis

Frequency analyses of the responses are shown in tables 1-6. High frequencies (84.2 percent and 79.1 percent, respectively) were obtained for positive worker responses to the questions “How easy is it for you to recognize and identify hazardous chemicals?” and “How likely are you personally to avoid exposure to chemicals?” (see table 1) Managers responded positively to the first question in 56.3 percent of the sample, with 43.8 percent responding “about the same,” and 56.3 percent said they were more likely to avoid exposures.

Seventy three percent of workers and 68.8 percent of managers talked more to workers about health and safety since the training. Workers and managers reported they talk more frequently to friends and family about health and safety since training (see table 2). Forty six percent of worker respondents have taught health and safety classes at work, and 31.2 percent in the local (see table 3). Numerous comments were appended to this question, some of which are described below.

Emergency plans have been written or improved since training in the companies represented by 51.1 percent of worker respondents and 87.5 percent of managers. Many workers stated their companies already had a plan in place. As expected, more managers (75 percent) than workers (33.8 percent) said they had influenced the improvement in emergency planning. Emergency plan training or practice took place in 57.6 percent of workers' facilities and 68.8 percent of managers' companies; 25.2 of the workers and 50.0 percent of the managers influenced the initiation of this OSHA-required training (see table 4.)

Changes in chemical handling, chemical use or processes, and replacement of hazardous chemicals with less hazardous ones were reported by a number of respondents, many of whom said they influenced the changes (see table 5). Safety committees have changed, often for the better, under influence from both workers and managers (see table 6).

Content Analysis of Comments

The comments were grouped into themes: lack of appropriate settings, company barriers, company facilitation, and the effect of local union support or lack of support. Some respondents reported no changes had occurred because the level of health and safety was already high and no improvements were needed.

Lack of appropriate setting. Comments in this category described issues such as workers being laid off, mill closings, and changes in job status or union position. In

general, the comments indicated that the training was not utilized because the workers are not in a position to do so. Examples are “Mill closed,” “No longer a steward,” and “I was laid off.” Comments explaining that the participant no longer was employed were associated in several instances with the negative “more difficult” and “less likely” responses.

Company barriers. These comments reflected two barriers, barriers due to lack of worker control and barriers due to lack of company support. Examples of comments reflecting company barriers were “Our safety program is stagnant due to constant change in management in the last year and a half” and “Company had and still has no use for my skills in this field.” Some respondents stated that the company “wants to control and dominate their safety program” or “doesn’t use hourly people for training.” Some companies were perceived to be uninterested in safety, as shown in the comments “Safety is not important to them anymore” and “Company dropped safety meetings.”

Company facilitation. A number of comments from workers indicated that the companies were supportive of workers’ efforts to participate in health and safety training, as well as to contribute to planning these programs. Comments included the following: “We have an excellent training program. I do ‘back up’ with the instructor” and “Company is working on improving (emergency) plan due to your training.” In one mill, Union Camp Fine Papers in Franklin, Virginia, a peer training team, initiated by a pipe fitter as a result of the university-union program, designs and delivers employee safety training that includes all floor workers, supervisors, clerical personnel, and managers.

Local union support. These comments reported activities in which workers engaged at local union meetings. “We plan on doing a hazcom update in the future and will incorporate it (the training) into this” and “We did have discussions at local meetings” are examples of comments in this category.

Lack of local union support. Problems such as lack of attendance at local meetings, lack of interest from local union leadership, and conflicts at the local union level prevented the workers from using their training. The problems were reflected in comments such as “Not enough members attend meetings” and “Due to serious problems at our local, I never finished the course.”

Safety and health already adequate. Some comments reflected good training programs already in place, a prepared and practiced emergency plan, and participation from hourly workers as trainers. Several managers commented that they were taking care of health and safety adequately prior to training.

Conclusions

Although no cause-and-effect relationship was documented, the survey responses suggest that training UPIU members and managers has had a positive impact on safety in UPIU workplaces. Areas where training impact occurred are as follows.

1. Recognition and identification of hazardous materials in the workplace were easier after training.
2. Emergency plans were written or improved to OSHA compliance as a result of training, and more emergency drills took place.

3. Workers who participated in the training program were more likely to avoid exposure to hazardous chemicals after training than before.
4. Since training, trainees were more likely to talk to other workers, friends, and family members about safety and health.
5. Safety committees, both union and joint labor-management, changed to reflect the knowledge that chemical awareness training brought to the workforce.
6. Changes in chemical use, process, handling, and substitution were positive. These kinds of changes are influenced by a number of factors in addition to training; company liability and public relations, as well as more stringent workplace and environmental regulations, probably can be credited for at least part of the change.

Managers who attended training were in every case accompanied by workers from the same facility, but the frequencies of responses were different between workers and managers. There are several possible reasons for these differences.

1. Workers and managers from the same plant may perceive conditions in the same way, but the larger worker sample included many whose managers were not invited or did not accept the invitations, reflecting a lack of labor-management cooperation in safety matters.
2. On basic knowledge questions such as ease of recognition and identification, managers may have had more prior education and training. The demographic data collected in the classes indicated managers were more likely to have earned college or

advanced degrees, usually in subjects related to workplace processes or safety. Most had taken university-level chemistry, while most of the workers had not.

3. Managers have a greater opportunity to influence safety programs; positive answers to the questions regarding trainees' influence on changes would be expected to be more frequent. As one manager commented, "Please keep in mind that I am a safety professional – supervisor of loss prevention. I view safety as my full time job and influence these matters daily."

One outcome not addressed in the survey was a correlation between training and accident-injury rate. One company volunteered the information that their OSHA-reportable accident rate declined from 5.56 to 3.04 in the two years since union members took responsibility for all safety training, while the severity factor of the accidents dropped from 43.23 to 16.41 (Barnes). Their spokesman credited the peer training program for the declines.

The union-initiated training program appears to have had an effect on health and safety in UPIU workplaces. Participants were grateful for the training and enthusiastic about its dispersion into the workplace. Continued efforts to identify barriers to peer training and seek to overcome them can only help to make the workplace safer for everyone – union members, nonunion workers, and managers – literally everyone in the facility and community.

Table 1

Frequencies of Responses to the Questions “How Easy Is It for You to Recognize and Identify Hazardous Chemicals?” and “How Likely Are You Personally to Avoid Exposure to Chemicals?”

	Ease of Recognition		Avoid Exposure		
	Workers (%)	Managers (%)	Workers (%)	Managers (%)	
Easier	84.2	56.3	79.1	56.3	More likely
Same	12.2	43.8	13.7	37.5	Same
More difficult	2.9	0	6.5	0	Less likely
No resp/ don't know	0.7	0	0.7	6.3	No resp/ don't know

Table 2

Frequencies of Responses to the Questions “How Often Do You Talk to Other Workers about Health and Safety?” and “How Often Do You Talk to Friends and Family Members about Health and Safety?”

	Talk to Workers	Talk to Friends/Family
	Workers (per cent)	Managers (per cent)
	Workers (per cent)	Managers (per cent)
More	73.4	68.8
Same	25.2	18.8
Less	1.4	0
No resp/ don't know	0	12.6

Table 3

Frequencies of Responses to the Questions “Have You Taught Health and Safety Classes at Work?” and “Have You Taught Health and Safety Classes in the Local?” (Workers Only)

	Taught at Work Since Training	Taught in Local Since Training
Yes (%)	46.0	31.2
No (%)	53.2	66.7
Other/ No resp (%)	0.7	2.1
Number Trained	11,529	3,554

Table 5.

Frequencies of Responses to Questions “Have There Been Changes in the Makeup or Activities of the Safety Committee?” “If Yes, Are These Good Changes in Your View?” and “If Yes, Did You Influence This?”

Changes in
 Committee Changes Good Influenced

	W (%)	M (%)	W (%)	M (%)	W (%)	M (%)
Yes	60.4	68.8	48.9	62.5	35.3	43.8
No	34.5	25.0	3.6	25.0	19.4	18.8
Other/ No resp	5.0	6.3	47.4	12.6	45.3	37.5

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Risk Mapping for Change: LOHP's Experience with Electroplating Shops

Background

In September, 1993, 56 year-old Ramon Romero tried to save a co-worker who had fallen into a tank of toxic sludge at an electroplating shop in Oakland, California. While his co-worker survived, Romero didn't. He left behind a wife and twelve children. Investigators later found that the eight-foot-high tank contained a mixture of sodium cyanide, zinc cyanide, sodium hydroxide, and hydrochloric acid. All of these are common chemicals in the electroplating industry, and all are hazardous.

In August, after a 10-month investigation, the company's owner, his wife, and a foreman were arrested on charges of involuntary manslaughter in Romero's death, according to local press reports which also said the company faced a \$741,000 fine by the federal and state Occupational Safety and Health Administrations related to the employee's death.

Both Cal/OSHA and the local district attorney's office investigated the incident, they found that nearly all the workers at the K&L plating facility were Spanish-speaking, and that none of them had ever received health and safety training. This came as no surprise to trainers at UC Berkeley's Labor Occupational Health Program (LOHP). Six months earlier we had contacted the company regarding our NIEHS-funded Spanish-language hazardous waste health and safety training program. The company turned down our offer of low-cost training. It appeared they didn't want to release workers for training because production time would be lost.

The Oakland accident spurred LOHP to develop a new outreach program targeting the Northern California electroplating industry. We also wanted to tailor a new hazard awareness training program specifically for workers in this industry. But we faced several challenges--the reluctance of employers to agree to worker training, the fact that the industry employs mostly Spanish-speaking workers, and the difficulty many workers have with reading or writing. Since most workers in the industry are unorganized, they

also tend to be reluctant to complain about job hazards out of fear for their jobs. We needed a training approach that was bilingual, that did not depend heavily on reading or writing skills, and that encouraged workers to identify problems and speak out about them.

We solved many of these challenges by basing our training on risk mapping. Since we developed the training program (which is offered in English or Spanish), we have held ten successful training sessions reaching about 250 electroplating workers.

Risk Mapping

The 2½ hour training begins with workers dividing into small groups. Each group draws a rough map of the workplace and marks the locations of various types of hazards commonly found in electroplating. Using different colored markers, workers show where there are hazards that could result in slips or falls, dangerous machinery, and other hazardous conditions. Using risk mapping as an opening activity creates a "buzz" in the room--people immediately begin talking and working together. In our experience, it also gets people thinking about their workplace in a new way.

After the maps are drawn, the entire class gets back together. The groups make suggestions for controlling the hazards they have identified. Our experience has been that the first group to report often chooses personal protective equipment (gloves, respirators, etc.) as the main way to prevent hazards. When this happens, the trainer takes the opportunity to explain different methods of control, and different approaches for fixing the problem. The trainer encourages the following groups to suggest controls that could help get rid of the hazard (like mechanical or engineering controls) rather than personal protective equipment. In this way, people learn to distinguish between the different kinds of controls and their effectiveness.

As the groups report, the trainer keeps a list of the hazards identified and the recommended controls. This list is later presented to management by the entire group. People learn how to present issues as a group, rather than approaching management individually. This is particularly important because most plating shops are not organized.

Individual workers usually feel hesitant to bring up issues they think could cost them their job.

Also, workers in these trainings usually have never been asked their opinion about how to reduce workplace hazards. Such issues are often addressed exclusively by management, with little input from workers. But our experience is that most managers respond surprisingly well when workers make suggestions. One manager was quite defensive about the methods of control suggested by workers in his shop. However, much to our surprise, he told LOHP a week later that he was beginning to implement some of the suggested controls. These included a new ventilation system and new non-slip floor grates.

Literacy and Language Issues

We found that a significant number of electroplating workers have difficulty reading or writing. Risk mapping is valuable because it does not rely on the ability to read or write. Rather, it requires only talking with each other, visually mapping out the hazards, and drawing on workplace knowledge to recommend changes.

We also found that risk mapping can cross language barriers. One employer assured LOHP that workers in his shop spoke English, and insisted that the training be given in English. When our English-speaking trainers arrived, they found that the majority of the workers spoke only Spanish. Yet a very successful risk mapping session was held with this group anyway. The risk maps themselves were an excellent form of communication between the workers and the English-speaking trainers. Drawing on the bilingual skills of a few workers in the group, everyone was able to join in discussing their maps.

Next Steps

Using risk mapping to identify hazards and recommend changes is just the first step in improving health and safety conditions in the plating industry. As a result of these sessions, LOHP has been able to convince a group of electroplating employers throughout Northern California to send workers to LOHP's more comprehensive 24-hour hazardous waste training course. A special version of this course will focus on hazards in the electroplating industry. It is another step in getting workers the health and safety information they need.

Workers also need to begin organizing in other ways to demand their rights to a safe work environment. As a university-based group, LOHP can only inform workers about their legal right to organize and refer them to resources in the community. Since many Latino community groups and resource agencies are currently struggling with funding cuts, it becomes increasingly important for unions to give increased attention to Spanish-speaking workers. Ultimately this is where the hope lies. Only then will we know that Ramon Romero did not die in vain.

This article was written by Michele Gonzalez Arroyo MPH, Eugene Darling, and Betty Szudy.

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RTK Net - An Internet Resource for Workers

by Luis Vazquez, MPH

International Union, UAW, Health & Safety Department,

Detroit, MI

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Do you work with toxic chemicals at your plant ? Do you live next to or near a industrial facility belching out mysterious toxic chemical vapors ? Want to know more about what you are being exposed to? Here's a useful resource you won't want to miss. The Right-to-Know network (RTK Net) provides publicly available information to union members, community groups, and others who want to know what industrial facilities are claiming to discharge up their stacks or ship out as hazardous waste.

RTK Net is an on-line computer network containing great volumes of data which industry must provide to the US Environmental Protection Agency on a periodic basis. The information provided by industry is made accessible by telephone (modem) or the Internet anytime, anywhere around the world, and best of all - RTK Net makes access to the information free of charge. The U.S. EPA maintains a similar search engine on the EPA website (<http://www.epa.gov>), with many of the same databases available. However, the RTK Net website is much easier to use.

When you log on to RTK Net via the World Wide Web, or via their dial-up phone number in Washington, D.C., their easy-to-use search software allows you to dig through numerous databases to find valuable data which may help you evaluate environmental conditions in your community, or perhaps the plant you work at. A search can be conducted for a particular workplace, a geographical area or zip code, or by Standard Industrial Classification (SIC) Code.

A geographical mapping program is available to be downloaded to PCs, to enable interested parties to plot out visually where facilities are located, thereby allowing individuals to estimate the hazardous chemical risks to particular communities. Many community groups have used this mapping program, along with U.S. Census and housing data, to outline Environmental Justice concerns. Frequently, facilities which use and discharge hazardous chemicals, and the dumps where hazardous chemicals are disposed of, end up being located in communities of color or communities where poverty and lack of political power are prominent.

Combining some of the information gathered from RTK-Net with another computer program called CAMEO, could be a very powerful tool for workers and

community groups. CAMEO allows the user to create a “plume map”, which would show what are the potential results from a release of a toxic chemical. The user would enter into CAMEO the physical location of a plant, chemical names and quantities being released, air temperatures, wind speed, and a few other factors, and CAMEO will show graphically where the chemical is likely to go, and how much time it would take for the chemicals to dissipate. Emergency planners (who sit on Local Emergency Planning Committees - LEPC’s) use this computer program to define what to prepare for should a chemical release happen in their area of jurisdiction.

Also available on RTK Net are more than 300 New Jersey Department of Health Hazardous Substance Factsheets, which are an incredible resource for workers and community groups who want to know more details about particular chemicals they may find listed on Toxic Release Inventory reports. New Jersey factsheets can also be compared with information found on Material Safety Data Sheets. Many times people have found the information on these New Jersey factsheets to be more complete than what is found on MSDSs. They are much easier to read and understand, since they are written in layman’s terms, they are consistently formatted (you will find the same type of information in the same place on each New Jersey Factsheet), and they have a hazard summary on the front page, so there’s no need to dig through the factsheet for the essential information which may be necessary during an emergency.

RTK Net started in 1989 in support of the Emergency Planning and Community Right to Know Act (EPCRA), which mandated public access to the federally managed Toxic Release Inventory. The on-line service is operated by the Unison Institute and OMB Watch, two nonprofit organizations, and is funded by various government agencies, foundations, and individual contributions.

Of particular use and interest to union members and community organizations are the following environmental databases:

TRI (EPA Toxic Release Inventory) - For over 300 toxic chemicals (the EPA recently expanded the number of chemicals to be reported on), this database gives maximum chemical amounts stored on site, and information about how much is released to the environment, either routinely or as a result of spills or other incidents. Knowing about maximum amounts on-site can help people prepare for a “worst-case scenario”. It can help an emergency response planning group decide if there is enough response equipment and personnel to deal with an emergency involving the chemical(s) in question.

Facilities must report their releases of toxic chemicals to the TRI if the following four criteria are met:

- 1) They must be a manufacturing facility (primary SIC code in 20-39);

- 2) They must have the equivalent of 10 or more full-time workers;
- 3) They must either manufacture or process more than 25,000 lbs of the chemical or use more than 10,000 lbs during the year;
- 4) The chemical must be on the TRI list of 350 specific toxic chemicals or chemical categories. This list was recently expanded by the EPA.

One drawback to using TRI is that not all, or even most, toxic chemical pollution is reported in the Toxic Release Inventory. Another drawback is that only a limited number of hazardous chemicals are on the TRI reporting list.

PCS (EPA Water Permit Compliance System) - this will tell you what your employer/neighborhood plant is supposed to be testing for when they discharge chemicals to waterways or sewers. Also, this database will tell you if the company is in compliance with their water discharge permit, and any enforcement actions taken by authorities.

ERNS (EPA Emergency Response Notification System) - this database tells you which companies have filed a report when they have spilled or released a chemical on an emergency basis, that is, if they file a report at all. This information is especially useful when critiquing a company's preparedness for potential future chemical release incidents by finding ways to prevent similar events from occurring.

BRS (EPA Resource Conservation and Recovery Act Biennial Reporting System) - this database tells you types and quantities of hazardous chemicals shipped offsite from a facility, and lists the disposal facilities where they supposedly end up.

DOCKET (EPA Civil Litigation) - this database identifies companies who are or have been sued in court for illegal environmental activities, by the US Department of Justice on behalf of the EPA. This database does not include information about criminal cases, only civil suits brought against companies.

CERCLIS (EPA CERCLIS Superfund Information System) - CERCLIS is the Comprehensive Environmental Response, Compensation, and Liability Information System. This database contains information about hazardous waste sites, all potential Superfund sites, as well as "Proposed" and "Final" sites that have been listed on the National Priority List (NPL). This database contains records on about 40,000 sites covered by CERCLA. CERCLA (enacted in 1980), and its amendments (SARA - enacted in 1986) are US Government Acts which established broad authority for the government to respond to problems posed by the release, or threat of release,

of hazardous substances, pollutants, or contaminants. CERCLA also imposed liability on those responsible for releases and provided the authority for the government to undertake enforcement and abatement action against responsible parties.

How can you use the information contained in these databases?

Union members can use these databases to find out about their company's environmental record, if one exists. The potential for hazardous chemical releases can be analyzed by workers and community groups. Participation in emergency response and evacuation planning is more effective when workers and community members take an active role and have the necessary information at hand. For instance, if a company is required to file annual Toxic Release Inventory reports with the EPA, they must also include information about maximum quantities of TRI chemicals they store on site. Workers can then use this detail to analyze a company's preparedness for a "worst-case scenario", by having the proper emergency response equipment on-site, by having a properly trained emergency response team, and by having a workable emergency response or evacuation plan. Workplace emergencies involving hazardous chemicals are covered by various OSHA standards in addition to EPA requirements.

Union Health & Safety Representatives, International Representatives, and Industrial Hygienists can use the data to be better prepared when inspecting a workplace, and thereby helping these worker representatives to better represent the union members. Information from the various RTK Net databases can be used as a basis for asking questions about industrial operations, storage and handling procedures for hazardous chemicals, worker health and safety training, and other job aspects.

Community groups and citizens can use the data to identify and learn more about potential chemical hazards posed by facilities located in their communities, and then enter into partnerships with businesses to bring about constructive changes, such as reductions in the use of toxic chemicals. As a result of public pressure and use of the environmental databases, one of the impacts of putting this information on-line has been to get companies to voluntarily reduce the amounts of toxic chemical emissions from their facilities.

Another use of the information on RTK Net is for labor, environmental, and community groups who would like to ensure that companies are in compliance with environmental reporting requirements. Companies which are not in compliance with EPA regulations are subject to substantial fines. An example of non-compliance is when a company fails to report entirely, or underreports discharges of TRI chemicals. Some environmental groups have been successful in getting companies to report their discharges, and even to reduce toxic

chemical usage, just by threatening to sue the companies for not complying with federally mandated reporting requirements.

Union organizers may find environmental information on their organizing prospects useful by giving some background that would normally not be accessible, and which companies certainly would like to withhold.

What are the potential pitfalls?

If a workplace is smaller, or does not use quantities of hazardous chemicals which exceed reporting thresholds, there may be no environmental record on RTK-Net or the EPA website. Another dead-end may occur when a company reports their environmental data under a parent company's name rather than their own. In this case, a geographical or SIC search would be better to conduct.

Having information, or access to information is one thing, being able to use it effectively is another. Of course, any recording system could have erroneous information entered into it. All of EPA's chemical reporting schemes require companies to be honest and open about what they are reporting, but not all companies are.

Training in how to use the data garnered from RTK-Net would be useful, in addition to the user having a basic understanding of EPA rules and regulations. Digging through EPA's rules and regulations could be tedious and time consuming, and not a favorite activity for time-strapped union reps. Data interpretation may require a specialist, but RTK-Net does provide a users manual on request, and will also provide some training and technical assistance. Once you have data in hand, the EPA can be consulted directly regarding the meaning of the data. Labor/environmental coalitions may find mutual benefits in conducting joint research into workplaces.

You should check out the RTK-Net website at the following URL:

<http://www.rtk.net>

If you want access to the data by directly dialing in with your modem, the telephone number is (202) 234-8570 (8,N,1)

RTK-Net's phone number is (202) 234-8494, fax (202) 234-8584, and their mailing address is 1742 Connecticut Avenue, NW, Washington, D.C., 20009

Examples of information downloaded from RTK Net

The first example is that of a 1993 Toxic Release Inventory (TRI) report on American Tape in Marysville, MI, UAW Local 1149. This site was of particular interest since American Tape was identified as the second largest discharger of the flammable and toxic chemical toluene in the State of Michigan. This facility would be a good candidate for toxic chemical use reduction, perhaps by switching to a water-based adhesive.

FACILITY REPORT (TRI DATA)

search used- Facility name: AMERICAN TAPE*

City: MARYSVILLE

State: MI

Year: ALL

TRI ID: ALL

Level of Detail: HIGH

Output Type : Text

Reporting Year: 1993

Facility Name: AMERICAN TAPE CO.

Address: 317 KENDALL AVE. MARYSVILLE, MI 48040

County: ST CLAIR Lat/Long: 0425304 / -822853

EPA ID: MID061862926 TRI ID: 48040MRCNT317KE

D&B Number: 103512893

Public Contact: JORDAN THOMPSON Phone: (810) 364-9000

Primary SIC: 2671

All SIC Codes: 2671

NPDES IDs: MI0039021

Parent Company: NA D&B #: NA

Year: 1993 EPA Region: 05

Breakdown of releases and waste generation (by chemical) follows:

Chemical Name: TOLUENE

CAS Number: 000108883 (Name: AMERICAN TAPE CO.)

Maximum Amount On Site: 100,000 - 999,999 LBS (Year: 1993)

Medium Release (lbs) Destination or Method Used

FUGITIVE AIR 299,716

STACK AIR 4,162,511

OFF-SITE 48,041 TO: ROSS INCINERATION SERVICES INC.

GRAFTON, OH

USING: INCINERATION/THERMAL

TREATMENT

Total 4,510,268

Generation of production-related waste in lbs (On=on-site, Off=off-site)-

Year: (*=projected)	1992	1993	1994*	1995*
Rel. or Disp:	3,911,016	4,462,257	4,430,052	3,571,229
Recycled On:	16,944,571	16,303,027	17,113,141	17,455,404
Energy On:	0	0	0	690,000
Treated Off:	28,842	48,041	52,170	43,260
Total:	20,884,429	20,813,325	21,595,363	21,759,893

Non-production-related waste: 0 (accidental or remedial)

Total waste generated : 20,813,325 (Production & Non-Production)

Production Ratio: 1.14

"Rel. or Disp" above = quantity released on-site or disposed off-site

"Energy" above = quantity burned for energy recovery

Chemical Name: ZINC COMPOUNDS

CAS Number: N982 (Name: AMERICAN TAPE CO.)

Maximum Amount On Site: 10,000 - 99,999 LBS (Year: 1993)

Medium Release (lbs) Destination or Method Used

Medium	Release (lbs)	Destination or Method Used
OFF-SITE	250	TO: ROSS INCINERATION SERVICES INC. GRAFTON, OH USING: INCINERATION/THERMAL TREATMENT
OFF-SITE	250	TO: LAIDLAW ENVIRONMENTAL SERVICES INC. CORUNNA ONTARIO, CANADA USING: INCINERATION/INSIGNIFICANT FUEL VALUE
OFF-SITE	250	TO: ROSS INCINERATION SERVICES INC. GRAFTON, OH USING: INCINERATION/INSIGNIFICANT FUEL VALUE
OFF-SITE	26,096	TO: ST. CLAIR COUNTY LANDFILL SMITHS CREEK, MI USING: LANDFILL/DISPOSAL SURFACE IMPOUNDMENT

Total 26,846

Generation of production-related waste in lbs (On=on-site, Off=off-site)-

Year: (*=projected)	1992	1993	1994*	1995*
Treated Off:	29,675	26,769	25,350	22,400
Total:	29,675	26,769	25,350	22,400

Non-production-related waste: 0 (accidental or remedial)

Total waste generated : 26,769 (Production & Non-Production)

Production Ratio: 1.14

Totals for all chemicals for AMERICAN TAPE CO.

Releases and Transfers (in lbs) -

Fugitive air : 299,716

Stack Air : 4,162,511

Off-site Transfer: 74,887

Total : 4,537,114 (Year: 1993)

Amounts of production-related waste generated (in lbs, for current year)-

Released On-site or Disposed Off-site: 4,462,257

Recycled On-site : 16,303,027

Treated Off-site : 74,810

Total Production-Related Waste : 20,840,094

Total Non-Production-Related Waste : 0

Total Waste Generated : 20,840,094

The second example is of an incident which occurred at EMS-Togo, a manufacturer of coatings, adhesives, and sealants located in Taylor, MI, UAW Local 157. This example is important because of the potential for explosion or excessive worker exposure to the solvents Methyl Ethyl Ketone and acetone. This company later discontinued manufacturing solvent-based adhesives.

DISCHARGER REPORT (ERNS DATA)

search used- Discharger: EMS TOGO CORPORATION

City: TAYLOR

County: ALL

State: MI

Year: 1990

Level of Detail: HIGH

Basic spill information-

Date: 04/16/1990 Time: 2300

Street: 20219 NORTH LINE RD City: TAYLOR State: MI Zip:

Discharger information-

Discharger: EMS TOGO CORPORATION Type: PE

Street: 20219 NORTH LINE RD

City: TAYLOR State: MI Zip: 48180

County: WAYNE EPA Region: 05

Discharger Phone: 2nd Phone:

Material spilled: METHYL ETHYL KETONE

Amount spilled: 260 GAL or 1,742 lbs

Material spilled: ACETONE

Amount spilled: 260 GAL or 1,716 lbs

Further information follows-

Environmental media involved (T/F or True/False)-

Air: T Land: F Water: F Groundwater: F Facility: F Other: F

Waterway/other: ATMOSPHERE

Transport Mode: Fixed Vehicle ID:

Causes of incident (T/F or True/False)-

Trans. accident: F Equipment failure: F Dumping: F Unknown: F

Operator Error: F Natural Phenomenon: F Other cause: F

Event Description-

A MIX TANK FOR THE PRODUCTION OF ADHESIVES OVERHEATED WHEN IT WAS NOT SHUT DOWN AT END OF DAY, BOILED OFF ITS CONTENTS

Miscellaneous-

THIS CO. MANUFACTURES ADHESIVES, THE MIXER THAT BOILED OFF THE CHEMS USED IN THE PROD. PROCESS, NORMALLY WOULD NOT DO THIS.

Action taken-NONE

How was spill found?: O (O=occured, D=discovered, P=planned)

Caller wanted confidentiality (T/F): F

Call received at- Date: 04/17/1990 Time: 1604

The third example is of a Emergency Response Notification System (ERNS) report on Moeller Manufacturing in Livonia, MI, UAW Local 157. This ERNS report indicates the manufacturer was allowing workers to dispose of drums of metalworking fluids on the site by puncturing drums and letting it seep into a drain - an illegal operation. Inspection of this facility by UAW Health & Safety Department staff led to recommendations for improvement of working conditions. When the company disregarded the recommendations, workers and the Local Union filed complaints with Michigan OSHA, which earned the company numerous citations for the very items the union pointed out.

DISCHARGER REPORT (ERNS DATA)

search used- Discharger: MOELLER*

City: LIVONIA County: WAYNE State: MI

Basic spill information-

Date: 08/22/1989 Time: 1430

Street: 12173 MARKET ST.

City: LIVONIA State: MI Zip:

Discharger information-

Discharger: MOELLER MFG. Type:

Street: 12173 MARKET ST.

City: LIVONIA State: MI Zip:

County: WAYNE EPA Region: 05

Discharger Phone: 2nd Phone:

Material spilled: DDM FLUID, COOLANT, OTHER

Amount spilled: 1 BBL or 350 lbs

Material spilled: TOXIC MATERIAL

Amount spilled: 0 UNK

Further information follows-

Environmental media involved (T/F or True/False)-

Air: F Land: T Water: T Groundwater: F Facility: F Other: F

Waterway/other: STORM DRAIN

Transport Mode: Fixed Vehicle ID: NONE

Causes of incident (T/F or True/False)-

Trans. accident: F Equipment failure: F Dumping: T Unknown: F

Operator Error: F Natural Phenomenon: F Other cause: F

Event Description-

DRUM DUMPING

Miscellaneous-

OWNER HAS TOLD JANITORS TO PUNCH HOLES IN BOTTOM OF DRUM WHEN FULL AND LET TOXIC MATERIAL RUN INTO DRAIN. THIS IS DONE REGULARLY BEHIND THE BLDG.

Action taken- NONE

Caller wanted confidentiality (T/F): F

Call received at- Date: 08/22/1989 Time: 1430

Information gathered for this article comes from the RTK Net website, and US EPA web pages

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