

WOSHTEP NEEDS ASSESSMENT REPORT

Opportunities to Integrate Worker Health and Safety Education into Building Trades Apprenticeship Programs



Prepared by

**UCLA Labor Occupational Safety and Health Program for the
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The Worker Occupational Safety and Health Training and Education Program (WOSHTEP) is administered by the Commission on Health and Safety and Workers' Compensation (CHWSC) in the Department of Industrial Relations through interagency agreements with the Labor Occupational Health Program at the University of California, Berkeley, the Labor Occupational Safety and Health Program at the University of California, Los Angeles and the Western Center for Agricultural Health and Safety at University of California, Davis.

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EXECUTIVE SUMMARY

The construction industry had the largest number of work-related deaths (969) nationwide in 2008, almost 20% of the total number of deaths across all industries (5,071) nationwide. In particular, Latino and young workers experience a high number of work-related deaths each year. This makes the provision of effective worker training to prevent injuries, illness and deaths a priority for government, employers, unions and occupational safety and health organizations.

Joint labor-management apprenticeship training programs provide quality training and preparation for workers entering the industry. They also provide a potential avenue to integrate worker health and safety education and to reach workers early in their careers. The California Worker Occupational Safety and Health Training and Education Program (WOSHTEP) curricula prepare workers in all industries to identify hazards and take steps to prevent work-related injuries and illnesses. This report describes an approach to addressing worker injuries and illnesses in the construction industry by bringing together WOSHTEP resources with resources of apprenticeship and pre-apprenticeship programs.

From July 2007 to July 2009, the UCLA Labor Occupational Safety and Health (LOSH) Program, with funding from the Commission on Health and Safety and Workers' Compensation (CHSWC), conducted activities to assess the potential for adapting and incorporating WOSHTEP curricula into apprenticeship and pre-apprenticeship training programs in California. These activities built on the findings of previous inquiries in this area conducted by LOSH and the UC Berkeley Labor Occupational Health Program (LOHP), in conjunction with the California State Building and Construction Trades Council of California (SBCTC) and CHSWC. The goal of the assessment was to determine whether any or all of the following are feasible:

- Increase the capacity of the building trades to address workplace health and safety;

- Include occupational health and safety education in apprenticeship and pre-apprenticeship programs to reach vulnerable workers before they enter the workforce; and/or,
- Develop the capacity of apprenticeship and pre-apprenticeship instructors to teach health and safety using effective adult education techniques.

This report summarizes LOSH's activities, findings, and recommendations resulting from the assessment. These findings include:

- Joint Labor-Management Apprenticeship Programs, which have long been recognized for providing quality training, are the main pathway into the unionized construction trades. The most common safety training in Joint Labor-Management Apprentice Programs is the Occupational Safety and Health Administration (OSHA) 10-hour construction training. Some programs also offer the Focus Four and Tailgate Safety training.
- Young or inexperienced workers may enroll in pre-apprenticeship programs that teach them skills to enter union apprenticeship programs, but may not necessarily provide them with worker health and safety education.
- The OSHA 10-hour training, which is typically administered as a PowerPoint presentation and lecture, limits the engagement of non-English speaking participants and risks losing the attention of young workers.
- During focus groups, building trades workers described the OSHA 10-hour training as "boring, dull and a challenge to make interesting."

Based on these findings, recommendations include:

- Create shorter and more interactive 15-minute lessons with case studies using existing WOSHTEP materials and resources from the OSHA 10-hour training, FACE Fact sheets, Focus Four, Smartmark and BuildSafe California Safety Break Cards.
- Use building and construction site-specific case studies in trainings, including case studies that use examples of green building projects.

- Translate materials into Spanish and other languages that represent the new workforce in construction and building trades.
- Create materials which are accessible to workers at various literacy levels using diagrams and illustrations.

Finally this report concludes with plans for pilot testing and disseminating adapted WOSHTEP materials and suggestions for areas of future exploration.

WOSHTEP NEEDS ASSESSMENT REPORT

Opportunities to Integrate Worker Health and Safety Education into Building Trades Apprenticeship Programs

A. Introduction

The construction industry had the largest number of work-related deaths (969) nationwide in 2008, almost 20% of the total number of deaths across all industries (5,071). This makes the provision of worker training on injury and illness prevention a priority for governments, employers, unions and occupational safety and health organizations. Joint Labor-Management Apprenticeship training programs have long been recognized as providing quality training and preparation for workers entering the industry. These programs provide a potential avenue to integrate worker health and safety education. The California Worker Occupational Safety and Health Training and Education Program (WOSHTEP) provides curricula that prepare workers in all industries to identify hazards and take steps to prevent work-related injuries and illnesses. This report details efforts to address worker injuries and illnesses in the construction industry by bringing together the resources of WOSHTEP with those offered by apprenticeship and pre-apprenticeship programs.

B. The Big Picture

Worker Health and Safety in Construction

Work in the construction industry is well recognized as dangerous. In 2008, the construction workforce comprised 6% of the national workforce (8.7 million workers) but 20% of workplace deaths.¹ Figure 1 below shows the number and rate of fatal occupational injuries in 2008.² Out of the total number of deaths across all industries which was 5,071, construction workers had the largest number of work-related deaths compared to other industries with 969

¹ Occupational Safety and Health Administration. *The Top Four Construction Hazards*. Power Point edition.

² Census of Occupational Fatalities. U.S. Bureau of Labor Statistics. U.S. Department of Labor. 2008. Available through <http://www.bls.gov/iif/home.htm>. Accessed 2/26/10.

deaths.³ The death rate for construction was 9.6 per 100,000 full-time workers, nearly 3 times the national average.⁴ In California, construction comprises about 3% or 606,500 of the workforce^{5, 6} but about 16% of workplace deaths.⁷

The federal Occupational Safety and Health Administration (OSHA) has identified four leading causes of death in the construction industry, commonly referred to as the “Focus Four” hazards. The Focus Four hazards are: falls; struck-by hazards, which includes being hit by vehicles or objects; electrical hazards; and caught in/between hazards, such as trenching collapses. Falls are the leading cause of construction fatalities. They accounted for 34% of construction deaths in the U.S. and 36% of construction deaths in California in 2008. Nationwide, one in four “struck-by-vehicle” deaths involve construction workers, more than any other occupation. Electrical fatalities account for 9% of construction deaths in the nation and about 8% of construction fatalities in California. Caught-in/between deaths represent about 9% of construction fatalities nationwide and 5% of construction fatalities in California. Workers are at risk for being caught in trenches, in unguarded equipment, or during equipment maintenance.⁸

The U.S. Bureau of Labor Statistics (BLS) ranks construction among the top 10 fastest growing industries in the U.S.⁹ BLS projects that there will be a 10.2% increase in construction jobs between 2006 and 2016.¹⁰ This means that more workers will be at risk for work-related injuries and fatalities in the construction industry. Workers vulnerable to increased risk of work-related injuries and fatalities include youth (16-24 years old), inexperienced workers, and Latinos. In 2007, there were 378,000 young workers in construction nationwide, and BLS listed construction laborers as one of the top 10 occupations in which these workers were

³ Census of Occupational Fatalities 2008 Preliminary Data. U.S. Bureau of Labor Statistics. U.S. Department of Labor.

<http://www.bls.gov/iif/oshcfoi1.htm>. Data Available through: <http://www.bls.gov/iif/oshwc/cfoi/cfch0007.pdf>. Accessed 4/1/10.

⁴ *Ibid.* <http://www.bls.gov/iif/oshwc/cfoi/cfch0007.pdf>

⁵ California Economic Development Department. Labor Market Info. Press Release Worksheet California and Los Angeles County Model and United States CPS Labor Force Data 2008 Benchmark. <http://www.calmis.ca.gov/file/1fmonth/calpr.pdf> Accessed 2/26/10.

⁶ California Economic Development Department Labor Market Info. Industry Employment CES.

<http://www.labormarketinfo.edd.ca.gov/cgi/dataanalysis/cesReport.asp?menuchoice=ces> Accessed 2/26/10.

⁷ Census of Occupational Fatalities. U.S. Bureau of Labor Statistics. U.S. Department of Labor. 2008. State Occupational Injuries, Illnesses, and Fatalities. Available through <http://www.bls.gov/iif/oshstate.htm#CA> Accessed 2/26/10.

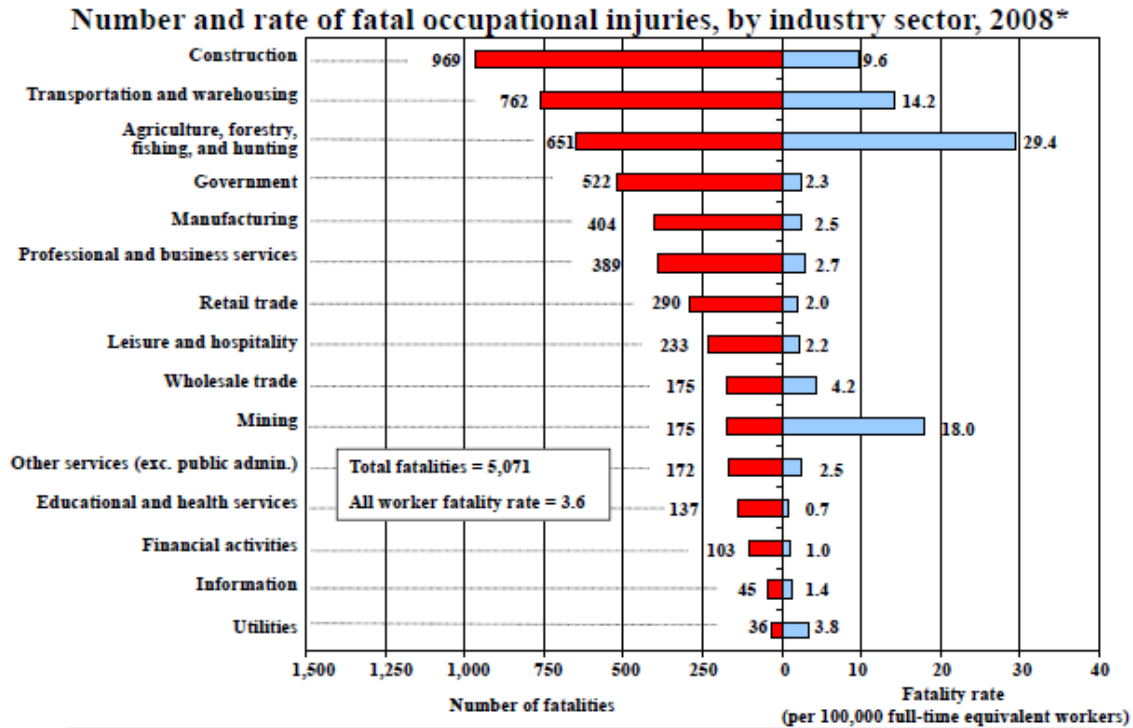
⁸ Occupational Safety and Health Administration. *The Top Four Construction Hazards*. Power Point edition

⁹ U.S. Bureau of Labor Statistics. U.S. Department of Labor. 2008. Available through: <http://www.bls.gov/>

¹⁰ *Ibid.*

employed.¹¹ Of concern is the fact that construction laborers had the highest fatality rate out of all construction occupations in the private construction industry in 2008.¹²

Figure1



In the United States, the composition of the construction workforce has undergone a marked change in the past two decades. In 1980, 5.8% of the construction workforce was Latino, whereas in 2008, Latinos comprised 29.6% of the construction workforce. This figure is expected to increase to 36% in the next decade. Most Latinos in construction (75%) are new immigrants.¹³

Latino construction workers have consistently experienced a high work-related death rate. Out of all construction deaths in 2008, 25% were among Latino workers.¹⁴ Several factors

¹¹ *Ibid.*

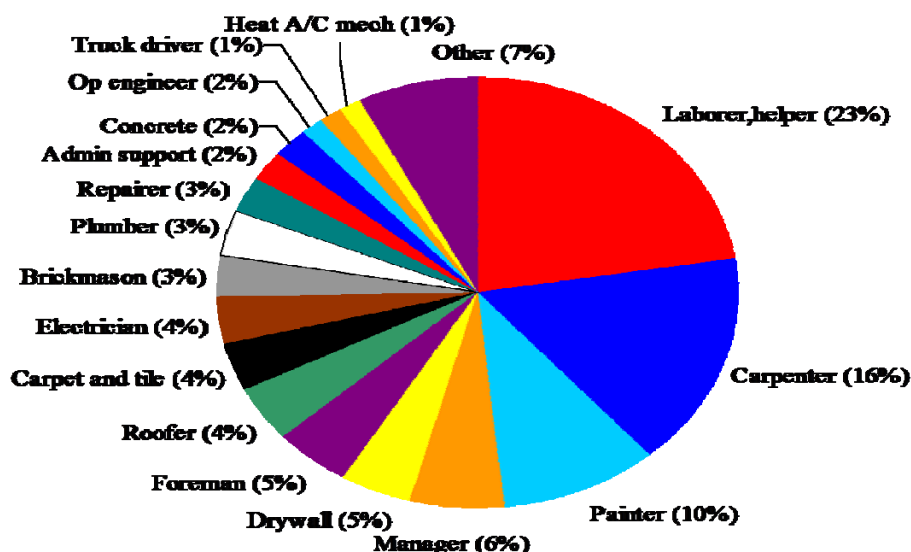
¹² Census of Occupational Fatalities. U.S. Bureau of Labor Statistics. U.S. Department of Labor. 2008. Available through <http://www.bls.gov/iif/home.htm>. Accessed 2/26/10.

¹³ Occupational Safety and Health Administration. *The Top Four Construction Hazards*. Power Point edition

¹⁴ *Ibid.*

may explain the impact on Latino workers. Latino workers are more likely than non-Latinos to work in low-skilled, high-risk construction occupations, such as laborers and carpenters. Figure 2 shows the average distribution of Latino construction workers among all types of employment.

Figure 2: Occupations of Hispanic Workers in the Construction Industry (2003-2005)¹⁵



Additionally, many foreign-born construction workers are not proficient in English. The Center for Construction Research and Training found that 42% of Latino production workers (laborers) reported they cannot speak English very well and another 42% reported they cannot speak English at all.¹⁶ They also found that Latino construction workers are less likely than non-Latino construction workers to be union members. In 2005, less than 14% of union members in construction were of Hispanic origin, even though Hispanic workers accounted for 23% of the construction workforce.¹⁷ Lower rates of union membership among Hispanic workers have a negative effect on their wages, access to health insurance, pension, and other benefits, as well as working conditions.

¹⁵CPWR. 2007. The Construction Chart Book: The U.S. Construction Industry and Its Workers Fourth Edition. CPWR – The Center for Construction Research and Training, produced with support from the National Institute for Occupational Safety and Health grant number OH008307

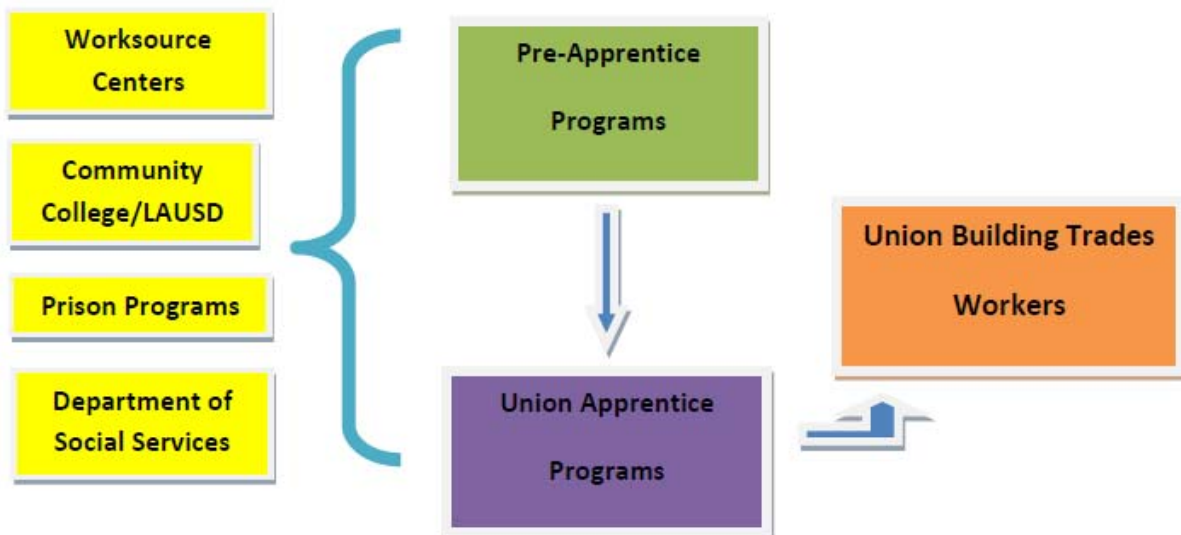
¹⁶*Ibid.*

¹⁷*Ibid.*

Apprenticeship and Pre-apprenticeship Programs

Workers enter the construction industry in a variety of ways. The main pathway to working in the unionized construction trades is through apprenticeship programs. Alternately, young or inexperienced workers may enroll in preparation for apprenticeship (pre-apprenticeship) programs which offer workers the skills to enter and succeed in an apprenticeship program. Joint labor-management apprenticeship training programs have long been recognized for their ability to provide quality training and preparation for building trades workers. Figure 3 depicts the various paths an individual may follow on the way to becoming a union building trades worker. Programs along this career pathway provide potential avenues to integrate worker health and safety education which could save lives and reduce the number of hazards, work-related deaths and injuries in the construction industry. There is great potential for progress in creating a partnership between Pre-Apprentice, Apprentice Programs, SBCTC and WOSHTEP to create effective materials and modules that can be used in classrooms and at tailgate trainings.

Figure 3: Roadmap to Work in the Union Building Trades



Pathways to Union Building Trades Careers

Individuals may enter the path to a career in the union building trades through WorkSource Centers, local school districts or community colleges, nonprofit organizations, prison or parolee programs, local Departments of Social Services, or through targeted outreach conducted by apprenticeship or pre-apprenticeship programs. Below are brief descriptions and examples of three programs in Los Angeles that serve as potential starting points for reaching workers with education about their health and safety.

Recruitment and Support Services

1) WorkSource Centers

Local WorkSource Centers serve as a community resource through which job seekers are assisted in their search for employment.¹⁸ WorkSource Centers aim to meet the needs of a wide range of individuals by providing training, access to public services, unemployment benefits, education, small business development resources, career counseling, and more. Services are provided at low- to no cost to participants, though more intensive levels of service require some eligibility assessment. Local workforce development programs, including WorkSource Centers, are supported by federal Workforce Investment Act funds and are administered by Workforce Investment Boards.

2) Local School Districts and Community Colleges

Many local school districts and community colleges offer programs that prepare individuals to enter the construction workforce. In Los Angeles, the Los Angeles Unified School District (LAUSD) and the Los Angeles Community College District provide job training for individuals interested in construction careers.¹⁹

¹⁸ Work Source www.worksourceonline.com. There are 18 Work Source centers in Los Angeles County alone; a few focus on recruiting workers into Building Trades apprenticeship programs.

¹⁹We Build Program www.laschools.org

3) Nonprofit Organizations

Nonprofit organizations also play a role in training and placing people into construction jobs. Nonprofits fill in the gaps left by union- and government-funded programs by helping people navigate through the extensive but disconnected system of existing programs. Additionally, they advocate for services for specific populations, provide training, and conduct outreach, referral, coordination and placement services.

Entry Points into Building Trades Careers

1) Pre-apprenticeship Programs

Pre-apprenticeship programs offer a variety of services to prepare individuals to enter the construction industry. Some offer students hands-on opportunities to explore construction work before entering the workforce. Others offer more “soft skills” such as life skills, preparing for interviews, and resume writing. Unlike apprenticeship programs, pre-apprenticeship programs are not monitored by the California Division of Apprenticeship Standards. Therefore, there are currently no guidelines or standards for curriculum in these programs. Pre-apprenticeship programs may or may not offer worker health and safety education and certificates to their participants. Some Community Colleges and LAUSD provide pre-apprentice programs. One example of the programs offered by LAUSD is the We Build program. We Build is a \$19.2 billion school construction and modernization training program designed to meet the needs of various stakeholders including LAUSD, Los Angeles residents, contractors, and building trade unions in the City of Los Angeles. The program provides 10-week, 300-hour pre-apprenticeship training for individuals interested in gaining on-the-job skills in order to enter a construction trades union or the construction labor force. To be eligible, participants must reside within the LAUSD service area, be 18 years or older, and possess both a valid driver’s license and a valid social security card.

2) Joint Labor-Management Apprenticeship Programs

Apprenticeship programs provide people access to long-term career opportunities. They are a paid, hands-on, joint labor-management approach to train individuals for careers in the skilled trades and crafts such as laborers, electricians, painters, bricklayers, or ironworkers. Programs range from 3-5 years. Most expenses are covered by training trust funds supported by union members' dues and contributions from contractor associations. For example, the International Brotherhood of Electrical Workers (IBEW) Local 11 and the National Electrical Contractors Association (NECA) have established a Joint Apprenticeship Training Committee (JATC) to oversee apprenticeship training.²⁰

Apprenticeship programs consist of approximately 80% on-the-job training and 20% classroom training. The California State Division of Apprenticeship Standards oversees and sets standards for all apprenticeship programs. In this report, we focus on Los Angeles construction-related apprenticeship programs; however, most apprenticeship programs follow a similar training curriculum for workers within a particular construction industry.

3) Union Building Trades Workers

The final step along the pathway to a career in the union building trades is becoming a journeyman. One becomes a journeyman after completing a joint labor-management apprenticeship program. Certain industries require journeymen to maintain their current skills by attending refresher courses. Journeymen are also offered opportunities to attend continuing education sessions where they can learn new skills such as reading blueprints and building plans or managing and supervising projects. In addition, journeymen are provided additional opportunities to further their career by becoming union presidents, business managers, worksite foremen, or contractors.

²⁰ IBEW 11/NECA Electrical Training Institute www.laett.org

4) California State Building and Construction Trades Council

The California State Building and Construction Trades Council of California (SBCTC) is dedicated to advocating for and protecting the jobs, health, safety, and economic conditions of unionized building and construction workers. SBCTC bridges the gap between community members, unions, and apprenticeship programs, with the goal of bringing new people into union jobs through apprenticeship programs. SBCTC works to ensure worksite safety, to protect and strengthen collective bargaining agreements, and to protect the economic status of affiliates and union members. In order to fulfill its mission, SBCTC provides education and outreach programs for affiliates. In recent years, SBCTC has implemented the OSHA Focus Four training program to educate members about preventing workplace accidents and fatalities. They have also focused on preventing occupational injuries and illnesses through programs such as Hardhats United to Save Hearing (HUSH) to prevent hearing loss. Both programs have been implemented in collaboration with UCLA-LOSH and UC Berkeley-LOHP, laying the groundwork for continued collaboration through the WOSHTEP program. In addition, SBCTC has assisted affiliates with reaching potential apprenticeship program candidates through the Building California Construction Careers (BC3) outreach program.

The 13 unions currently affiliated with the California SBCTC are²¹: the International Brotherhood of Boilermakers (IBB); International Union of Brick and Allied Craft Workers (IUBAC); the International Brotherhood of Electrical Workers (IBEW); International Union of Elevator Contractors (IUEC); International Association of Heat & Frost Insulators and Asbestos Workers (IAHFIAW); the International Union of Bridge, Structural, Ornamental and Reinforcing Ironworkers (IABSORI); the Laborers International Union of North America (LIUNA); the International Union of Painters and Allied Crafts (IUPAT); the Operative Plasterers and Cement Masons' International Union (OPCMIA), the United Unions of Roofers and Waterproofers and Allied Workers (IURWAW); the Sheet Metal Construction National Association (SMCNA); the

²¹ California State Building and Construction Trades Council <http://www.sbctc.org>. last accessed on 7/20/09.

International Brotherhood of Teamsters (IBT); and the United Association of Plumbers and Pipe Fitters (UA).²²

5) Trade Association Apprentice Programs

Although the majority of apprentice programs are provided by joint-labor management trust funds, a few trade associations also provide some training. The Associated Builders and Contractors (ABC)²³ and the Associated General Contractors (AGC)²⁴ are two examples. These associations provide Apprenticeship training throughout the year in various trades and are accredited programs recognized federally and within the state. AGC also offers a “Careers in Construction” outreach program which reaches out to educate elementary and high school students about the industry.

C. Outreach and Needs Assessment Activities

WOSHTEP trains employees each year on how to put into action an effective health and safety plan. The trainings use interactive methods to engage workers at all levels in the process of creating their own health and safety environment at the workplace. WOSHTEP has also specialized in offering their courses in a variety of languages and literacy levels throughout the state of California from farm workers to hotel workers. The Apprentice Model is a unique opportunity for WOSHTEP to make an impact on the training in the construction trades in partnership with LOHP and SBCTC.

From July 2007 to July 2009, the UCLA-LOSH, with funding from the Commission on Health and Safety and Workers’ Compensation (CHSWC), conducted activities to assess the potential for adapting and incorporating WOSHTEP curricula into apprenticeship and pre-apprenticeship training programs in California. These activities were based on the findings of

²² LIUNA in Northern CA, Operating Engineers and Carpenters not affiliated with CA SBCTC. Source: personal communication SBCTC Project Coordinator, 7/1/09.

²³ Associated Builders and Contractors Apprenticeship Program: <http://www.abcsocal.org/Apprenticeship.aspx>

²⁴ Associated General Contractors: <http://www.agc-ca.org/education.aspx>

previous inquiries in this area conducted by LOSH and the UC Berkeley Labor Occupational Health Program (LOHP), in conjunction with SBTC of California and CHSWC. The assessment aimed to determine whether any or all of the following are feasible:

- Increase the capacity of the building trades to address workplace health and safety;
- Include occupational health and safety education in apprenticeship and pre-apprenticeship programs to reach vulnerable workers before they enter the workforce; and/or,
- Develop the capacity of apprenticeship and pre-apprenticeship instructors to teach health and safety using effective adult education techniques.

WOSHTEP conducted a variety of outreach and needs assessment activities to assess the potential to adapt and incorporate WOSHTEP curricula into apprenticeship and pre-apprenticeship training programs. Interviews and discussions were conducted with representatives from union apprenticeship and pre-apprenticeship programs during local and statewide apprenticeship council meetings, focus groups, key informant interviews, and site visits. The following section summarizes the results of discussions and interviews conducted during the needs assessment with a special focus on the health and safety content and teaching methods currently used in apprenticeship programs, with vulnerable workers, and in green jobs. See Appendix A for questions used to guide interviews and discussions and Appendix B for a summary of outreach and needs assessment activities.

Current Health and Safety Training

All union apprenticeship programs include training on workplace safety and health. Programs in California are required to offer the Occupational Safety and Health Administration (OSHA) 10-hour construction training to participants. Although the OSHA 10 is the most popular health and safety training offered by apprenticeship programs, it is not necessarily the most effective. This training, which is typically delivered through PowerPoint presentations and lectures, was described by a focus group participant from the Bricklayers as “boring, dull and a challenge to make interesting.” This comment was echoed by multiple participants in the focus

groups.²⁵ Key informants also expressed that OSHA courses are not relevant to the reality of construction work. One key informant, a Worker Occupational Safety and Health (WOSH) Specialist trainer and member of IBEW Local 11, thought that the WOSH Specialist course is a good match for apprenticeship training programs because it is more interactive than health and safety training currently offered and looks at the real-life application of safety on the job.

In addition to the OSHA 10 course, apprentices receive training on specific workplace hazards including: ladder safety, electrical hazards, falling objects, cranes, fall protection, chemical hazards, and trenching. Typically, these trainings are focused on the hazards presented in a particular trade, such as electrical hazards for electricians. However, apprenticeship coordinators interviewed spoke of the importance of cross-craft training since they perceive it is becoming more common for many different trades to simultaneously work at the same site. A highly publicized example of this reality is the recent construction of the City Center in Las Vegas where 6 workers died during 15 months of construction. Workers cited conditions such as “crowded work sites, pressure to finish work quickly and fatigue from extensive overtime” as contributing factors to the high number of construction worker deaths on the project.²⁶ Apprentices also receive on-the-job training through tailgate safety training and oversight from an experienced journeyman mentor. Journeymen are invited to participate in training offered at the apprenticeship programs in order to keep their knowledge current. Safety and health training is one of the many courses journeymen can attend. Various unions, including the Laborers, Electricians, Ironworkers, and Cement Masons, also require journeymen to complete continuing education requirements. For example, the IBEW requires that journeymen complete 30 hours of continuing education per year to maintain their certification. Additionally, safety issues are often discussed at union meetings, safety committees and new employee orientation, and during tailgate training.

²⁵ Worker Health and Safety Focus Group at UCLA Downtown Labor Center in Los Angeles, CA. 2/25/09. Participants included building trades representatives from the Ironworkers, Bricklayers, Electricians, Painters, and Laborers Unions. The facilitator was former LOSH staff member Jessica Barcellona.

²⁶ Las Vegas Sun www.lasvegassun.com/news/topics/construction-deaths

Apprenticeship coordinators use a variety of training materials when conducting classroom training, including materials from their international unions, OSHA,²⁷ Smart Mark,²⁸ Focus Four,²⁹ contractor's associations, and internet-based information. Most apprenticeship coordinators use PowerPoint presentations and lectures to conduct health and safety training in the classroom. The apprenticeship coordinators we spoke with expressed interest in incorporating new teaching techniques and materials into their current trainings. They recognize the importance of using hands-on training and demonstrations to engage apprentices in the training. Additionally, coordinators believed that training materials should be based on real-life situations such as case studies. There was some disagreement about whether or not to include graphic details from real-life stories. Some coordinators believed that these details made the issue more real and that fear was a powerful motivator. However, others thought it took away from the educational merit of training. Training is typically conducted in English. Although many key informants recognized the need for offering training in Spanish, they reported that it has proved to be challenging.

Vulnerable Workers

Apprenticeship training programs are currently challenged to address the needs of vulnerable populations including young, inexperienced, and Latino workers. Individuals from these groups may have special needs which have not typically been addressed in apprenticeship programs. According to key informants, young workers may think that they are invincible and will not get hurt on the job, are typically less mature than older workers, and may be confronting other issues that may present barriers to completing the training. However, they stressed the importance of engaging youth in pre-apprenticeship and apprenticeship programs in order to support them on their path to union construction careers. Some unions, such as the Ironworkers in Los Angeles, have made a concerted and successful effort to recruit and support workers from underserved communities.

²⁷ Occupational Safety and Health Administration www.osha.gov

²⁸ CPWR SmartMark training <http://www.cpwr.com/training-smartmark.html>

²⁹ SBCTC Focus on Safety Training Materials www.sbctc.org

Similar issues arise when considering training for inexperienced workers who are entering the construction trades later in life. New workers may not understand or appreciate the hazardous conditions present on a construction site. In addition, they may confront issues that make it difficult to complete apprenticeship training.

As was previously mentioned, the Latino workforce in construction has grown over the past two decades. Apprenticeship coordinators expressed an interest in addressing the needs of the growing population of Spanish-speaking apprentices through Spanish-language or bilingual instruction and by including more visual or low-literacy materials. The Roofers apprenticeship program is an example of a program that attempts to address the needs of Spanish-speaking participants. Spanish-speaking apprentices in the Roofers program are currently offered printed materials in Spanish as well as English as a Second Language (ESL) classes.

Green Jobs

Many apprenticeship programs are beginning to address the issue of green building construction and retrofits. Although new construction has declined with the economic downturn, interest in building retrofits and weatherization is growing with an emphasis on energy efficiency and associated funding to create jobs in the green economy. Focus group participants discussed the fact that workers may be exposed to a variety of hazards on green job sites including an increased number of fall hazards when working at heights, exposure to lead and asbestos when retrofitting older buildings, and ergonomic and safety hazards when handling and installing solar panels. Some apprenticeship programs, such as IBEW, Laborers, and Pipefitters, are adapting their current courses to address green job tasks.

D. Findings and Recommendations

This needs assessment revealed opportunities to adapt the WOSHTEP curriculum for apprenticeship programs. Apprenticeship coordinators expressed considerable interest in supplementing their current health and safety programs with new materials. Their interest

provides an opportunity to adapt the WOSH Specialist curriculum so as to tailor it for apprentices. However, this opportunity also presents certain challenges. Although there is interest among apprenticeship coordinators, it will be necessary to get buy-in on many different levels from those in the various building trade training programs in order to incorporate WOSHTEP into apprenticeship programs. Apprenticeship programs currently cover a range of mandatory subjects, including OSHA 10 training, which makes for tight course schedules and little room for additional training. Finally, WOSHTEP is not mandatory for apprentices and does not offer a federal or state certification, as the OSHA 10 course does.

Given these opportunities and challenges, LOSH recommends that adaptations be made to tailor the WOSH Specialist curriculum to apprenticeship programs. See Appendix C for a summary of construction-related health and safety materials that are already a part of the WOSHTEP curriculum. In addition, we suggest that WOSHTEP materials be shortened in order to create 15-minute mini-lessons with case studies and discussion questions on specific topics. These mini-lessons may also include adaptations of existing materials such as: OSHA 10, Focus Four, Smartmark, FACE factsheets,³⁰ and BuildSafe California³¹ Safety Break Cards. New case studies that focus on worker safety in green construction should also be created. See Appendix D for samples of case studies. Adapted materials can be delivered to apprentices during orientations to their apprenticeship programs, in the classroom, or on-the-job at tailgate safety trainings. Apprenticeship instructors, senior apprentices, or journeymen could present training modules to apprentices during both classroom and tailgate trainings. Finally, adapted WOSHTEP training should be offered to journeymen as part of their refreshers, upgrade, or supervisory training.

Pre-apprenticeship programs may be better suited than apprenticeship programs for offering WOSHTEP training because their trainees have more time and may be more open to new ideas and ways of working. However, students in pre-apprenticeship programs often have not spent much time on construction sites and may not have a lot of work experience. Adapted WOSHTEP training would provide the opportunity to reach these workers before they enter the

³⁰ California Department of Public Health, Occupational Health Branch, FACE program www.cdph.ca.gov/programs/ohb-face

³¹ California Department of Public Health, Occupational Health Branch, BuildSafe California Safety Break Cards
<http://www.cdph.ca.gov/programs/ohb/Pages/BuildSafe.aspx>

workforce or begin an apprenticeship program. Building partnerships with local workforce development agencies is recommended as a good way to gain access to pre-apprenticeship programs.

E. Summary and Next Steps

The goal of the needs assessment conducted by LOSH was to assess the potential to adapt and incorporate WOSHTEP curricula for apprenticeship and pre-apprenticeship training programs in California. Staff determined that it is feasible to adapt the WOSHTEP curriculum to meet the needs of building trades workers in order to incorporate occupational health and safety education in apprenticeship and pre-apprenticeship programs. It is also feasible to develop the capacity of apprenticeship and pre-apprenticeship instructors to teach health and safety using effective adult education techniques. Additionally, offering WOSHTEP training in these programs will reach vulnerable workers before they enter the workforce.

Details about next steps including materials development, pilot testing, dissemination of adapted WOSHTEP material in apprenticeship and pre-apprenticeship programs, and recommendations for areas of further exploration are described below.

Materials Development

As specified in the 2009-2010 WOSHTEP program plan, LOSH will work in collaboration with LOHP and SBCTC representatives to systematically collect information, thus establishing a baseline against which future programs can be evaluated. Activities will include conducting a baseline survey and focus groups of apprenticeship coordinators and instructors who teach in union apprenticeship programs. In addition, existing building trades case studies and training materials will be compiled, reviewed and adapted for use in apprenticeship programs.

Pilot Testing Materials

LOSH will target a select number of union apprenticeship and pre-apprenticeship programs to pilot test the adapted WOSHTEP materials. Staff have been in communication with representatives from these programs and have tentative agreements to gain access to program

participants and to pilot test materials. LOSH will partner with the Roofers apprenticeship program to pilot adapted WOSHTEP modules and 15-minute mini-lessons. The WOSHTEP module pilot test would entail a 1-day (8 hours) training, to apprentices. In addition, 15-minute mini-lessons would be presented to 5 classes for 5 weeks. WOSH trainers from LOSH will serve as instructors during the pilot testing phase. Verbal and written feedback on the materials will be gathered at the end of each session. Piloted materials will be edited and adapted based on participant feedback and instructor experience.

LOSH will also pilot test materials in two YouthBuild pre-apprenticeship programs. Adapted WOSHTEP materials will be presented in 2-hour increments in 4 classes for 4 weeks at the La Causa YouthBuild Program. LOSH also plans to present 15-minute mini-lessons focused on green job hazards at the Watts Labor and Community Action Committee YouthBuild Program to 5 classes for 5 weeks. WOSH trainers from LOSH will once again serve as instructors during the pilot testing phase. Verbal and written feedback of the materials will be gathered at the end of each session. Piloted materials will be edited and adapted based on participant feedback and instructor experience.

English language materials will be used in the pilot testing phase. It is recommended that materials be professionally translated into Spanish once the English materials have been piloted. The Spanish-material pilot plan will be developed at a later date.

Material Dissemination

LOSH plans to disseminate the adapted WOSHTEP materials to apprenticeship programs through a variety of means including collaboration with representatives from SBCTC, CHSWC and LOHP to identify avenues for material dissemination. Presentations at quarterly meetings of the California Apprenticeship Coordinators Association (CACA) will inform apprenticeship coordinators about the availability of material. In addition, LOSH will partner with SBCTC to select apprenticeship programs and identify apprenticeship coordinators, higher-level apprentices, and journeymen who are interested in participating in a Train-the-Trainer program. The Train-the-Trainer program will prepare participants to use these materials in classroom and on-the-job trainings.

Areas for Further Exploration

Given recent interest in the issue, LOSH proposes to further explore green jobs in building construction retrofitting. This activity should build on the work currently being done by LOSH and the UCLA Community Scholars course. The Community Scholars course explored innovative approaches to address climate change and the creation of safe, green jobs in the construction industry.³² Future work should also incorporate the recent efforts of SBTC, CHSWC, LOHP and the California Department of Public Health Occupational Health Branch.

The opportunity to include health and safety in Project Labor Agreements (PLAs) to prevent workplace injuries and illnesses should also be further explored. PLAs are collectively bargained construction contracts between owners or their representatives and a range of craft labor unions. PLAs are a means to ensure the involvement of organized labor, local hire, and the protection of public investment in construction projects.^{33,34}

³² Delp, Linda and Elizabeth Stewart. (2009). Green Buildings, Good Jobs, Safe Jobs: Social Justice Pathways To A Sustainable Los Angeles. UCLA Community Scholars Report 2009. UCLA LOSH, Labor Center/California Construction Academy, UCLA Dept. of Urban Planning, and Institute for Research on Labor and Employment. <http://www.losh.ucla.edu/losh/projects/pdf/green-jobs-report.pdf> Accessed 3/15/10.

³³ Community Scholars Report. "Construction Careers for Our Communities." UCLA Labor Center 2008.

<http://www.labor.ucla.edu/programs/pdfs/ConstructionCareersForOurCommunitiesFullReport.pdf> Accessed 3/15/10.

³⁴ Johnston-Dodds, K. "Constructing California: A Review of Project Labor Agreements." 2001.

Appendix A: Needs Assessment Questionnaire

These questions were used as a guide during key-informant interviews and discussions with representatives from unions, apprenticeship, and pre-apprenticeship programs

What health and safety training do apprentices/pre-apprentices receive?

- What does the training cover? (content)
- How many hours of training do they receive?
- Who does the training? How are these trainers trained?
- What kind of training methods are used - interactive or lecture based? (Can you provide examples of interactive training?)
- Is there any follow-up? i.e., refreshers on H&S after the apprenticeship is completed?

Health and safety classroom and on-the-job training (are pre-apprenticeship programs also included in these points?)

- What is the content? resources? methods? What are the strengths and weaknesses?
- Do trainers/apprenticeship coordinators feel that apprentices are interested/engaged in the program?
- Do trainers/apprenticeship coordinators feel that the classroom training is practical and applicable to the field?
- How do trainers get feedback about the training? What do apprentices say that they most like about the training? What are common areas that workers say could be improved?
- How do trainers/apprenticeship coordinators think classroom training could be strengthened?
- What do workers think?
 - Does what they learn regarding workplace health and safety help them address the challenges they face?
 - For what role are the training programs preparing workers?
 - To identify hazards, address hazards, know what safety measures to take, report any safety hazards, get involved in safety committees, etc.

Appendix B: Summary of Outreach and Needs Assessment Activities

1. Presentations and Discussions

- **Los Angeles Apprenticeship Council meeting July 23, 2008, in Los Angeles.**

An overview of the WOSHTEP program was presented to apprenticeship coordinators from the Concrete Masons, Roofers, Ironworkers, Laborers, IBEW, and Pipefitters apprenticeship programs. The group discussed possibilities for incorporating WOSHTEP into apprenticeship orientation and training, pre-apprenticeship programs, and refresher training for journeymen or more experienced apprentices. Coordinators expressed interest in adapting WOSHTEP materials to real-life situations through case studies and reaching workers with limited literacy.

- **California Apprenticeship Council meeting, July 31, 2008, in San Diego**

An overview of the WOSHTEP program was presented to all apprenticeship coordinators present. Small group discussions were held with union representatives from the Ironworkers, Carpenters, Laborers, Sheetmetal Workers, Concrete Masons, and IBEW. Union representatives expressed interest in using interactive materials to supplement current training including the OSHA 10 course, implementing 10-minute safety meetings/trainings at the beginning of apprenticeship classes, and having senior apprentices lead sessions to learn presentation skills.

- **California Apprenticeship Council meeting, October 30, 2008, in Anaheim**

Small group and individual discussions were held with union representatives from the Concrete Masons, Roofers, Ironworkers, Laborers, Firefighters, Drywall/ Lathing, IBEW, and Pipefitters. Representatives expressed interest in using adapted WOSHTEP materials to complement the health and safety training already provided in apprenticeship programs. In

addition, the subject of reaching young workers through pre-apprenticeship and workforce development programs was also discussed and supported.

2. Focus Groups

Themes from one-hour focus groups conducted on February 25 and May 13, 2009, with six union representatives from the Ironworkers, Bricklayers, Electrical Workers, Painters, and Laborers included:

Health and safety training in apprenticeship programs. Union apprenticeship programs offer a range of safety training both in the classroom and on-the-job. Courses offered include OSHA 10/30 and special certifications for scaffolding, welding, first aid, CPR, lead, and asbestos abatement. Journeymen are welcome to attend courses offered to apprentices to maintain their certification. Tailgate training is offered at the job site which provides educational opportunities for apprentices as well as ongoing education for journeymen.

Green jobs. Green jobs are not necessarily different from traditional jobs . They may involve new technology or products, but most of the same work methods and hazards continue to exist. Union apprenticeship programs are working to address new issues that arise in green jobs and educate workers about these issues. New green building construction and retrofitting of existing buildings pose health and safety hazards for workers. It is expected that workers will continue to be exposed to traditional hazards, such as falls, electrical hazards, and general unsafe conditions, while working on green construction jobs. However, changes to work processes and products to make them more environmentally friendly may also benefit worker health. For example, worker exposure to toxic chemicals is reduced when using environmentally friendly low Volatile Organic Compound (VOC) paints.

Vulnerable workers. Participants in apprenticeship and pre-apprenticeship programs often represent vulnerable populations such as those who are young (under 24 years old), Spanish-speaking and women, or who confront other challenges. Apprenticeship and pre-apprenticeship programs are challenged to meet the needs of these particular populations.

Workplace injuries and illnesses. Workers are exposed to hazards on both traditional and green jobs which result in a variety of injuries and illnesses. All focus group participants spoke of personal injuries (cuts, broken bones, back injuries, vision damage), near misses (almost getting hit by falling objects or preventing co-workers from falling), and witnessing incidents on the job. Many green job hazards are expected to be similar to those found on traditional construction sites, such as falls, lead and asbestos exposure while retro-fitting older buildings, and overcrowding of worksites.

Preventing injuries and illnesses. There are a variety of ways to prevent worksite injuries and illnesses. Education and training are important to make workers aware of hazards, teach safe work practices, and ensure that worksite accidents and injuries are prevented. Also, qualified safety representatives and experienced workers play a role in mentoring apprentices and monitoring safety conditions on the jobsite. Worksite safety depends on how well safety is implemented on the job, including how well apprentices are mentored, attitudes about safety, and supervisor training. Focus group participants discussed the importance of workers and employers working together, through union contracts and Project Labor Agreements (PLAs), to ensure safe working conditions and prevent injuries.

3. **Key Informant Interviews**

- Representatives from SBCTC:
 - Program Coordinator
 - Director of Special Programs
 - Outreach Coordinator
- Staff from LOHP.
- Representatives from union apprenticeship programs (for more details refer to table below):
 - Apprenticeship Coordinator, Cement Masons
 - Apprenticeship Coordinator, Ironworkers
 - Apprenticeship Director, Roofers and Waterproofers
 - Regional Director, United Association of Plumbers and Pipefitters

- Apprenticeship Coordinator, Painters
- Representatives from Pre-Apprenticeship programs in Los Angeles (for more details refer to table below):
 - Program Instructor, Community Center Inc. WorkSource Center
 - Leadership & AmeriCorps Coordinator, La Causa Youth Build
 - Program Coordinator, Los Angeles Infrastructure Academy
 - Watts Labor & Community Action Committee, YouthBuild
 - President & Founder, YouthBuild USA
- Reviewed notes from Focus Four participant interviews with Apprenticeship Coordinators and union representatives from IBEW, Sheet Metal Workers, and Roofers and contractor representatives

Summary of Key Informant Interviews with Apprenticeship & Pre-Apprenticeship Representatives

<u>Program</u>	<u>Interviewee</u>	<u>Curriculum/Topics Covered</u>	<u>New Training Interest</u>	<u>Comments</u>
Cement Masons Apprenticeship	Apprenticeship Coordinator	OSHA 10/30, First Aid, CPR, Specific Products/ Equipment	Confined Space, Green Jobs 1-day TOT for apprenticeship instructors	
Ironworkers Locals 416 & 433 Apprenticeship	Apprenticeship Coordinator	OSHA 10/30, Construction Site Safety, Fall Protection, SmartMark, Steel Erection, Scaffolds, Rigging, Forklift, Lead, First Aid/ CPR	Green Job Hazards (asbestos abatement). Weekly "toolbox talks" on different safety topics. Do TOT via webinar or video conference.	Make new training materials uniform and email to each jobsite on a weekly basis. All worksites would cover same topic each week.

Painters Apprenticeship	Apprenticeship Coordinator	OSHA-10/30, First Aid/CPR, Fall Protection, Scaffold Safety, Respirators, Aerial Lifts/Forklifts	Hearing loss prevention, confined space, ergonomics, green jobs. Present materials during apprenticeship classes (M-Th, 4 hrs)	Benefit from real-world based training
Roofers & Waterproofers	Apprenticeship Director	SmartMark, OSHA 30, First Aid, CPR, Forklift, Lead, Confined Space, Silica, Scaffolds, Fall Protection	Green Job hazards (solar panels on roofs, chemicals). 1-day training for apprentices after 3 rd period.	Use games and prizes to keep attention in OSHA 30 training. Have done some Spanish language training in past. Now offer ESL classes & some printed Spanish materials.
Community Center Inc. WorkSource Center, Pre-apprenticeship	Pre-Apprenticeship Instructor	Pre-Apprenticeship, Test Prep, Prep for Union Entry Exams. No health & safety component.	Construction Site Safety & Health, Mental Health. 1 hour per week for 12-week course sessions.	
La Causa YouthBuild, Pre-apprenticeship	Leadership & AmeriCorps Coordinator	National Center for Construction Education & Research (NCCER), First-Aid, CPR. 10 months of hands-on instruction with up to 5 years	Hazmat, Cal/OSHA, construction worksite hazards, low cost First Aid & CPR. Open to offering as much time as needed (full or partial	Need these types of partnerships/collaborations

		follow up.	days, weekly)	
Los Angeles Infrastructure Academy, Pre-apprenticeship	Program Coordinator	Hands-on & classroom instruction. OSHA (youth, videos, website), on-site safety training before beginning hands-on work offered through L.A. Trade Tech College (power tools, framing, roofing, cement pours)	Any supplemental health & safety training. Would allot 2-4 hours	
Watts Labor & Community Action Committee- YouthBuild, Pre-apprenticeship	Director	Hazmat, OSHA 10, NCCER. 9-12 months of hands-on instruction with 2-year follow-up. Serves youth (18-24 yrs.). Provides stipends.	Green Job hazards (building, chemicals), Emergency & Disaster Preparedness. Would allot 10+ hours.	
YouthBuild USA, Pre-apprenticeship	President & Founder	NCCER, Hazmat, OSHA, Construction Safety & Health, Home Builders Institute. 9-12 months of hands-on instruction with 2-5 years follow-up. Serves youth (16-24 years). Provides stipends to participants.	Interested in partnering with LOSH at the local (L.A.) level	

4. Site Visits

- **Electrical Training Institute**, an apprenticeship training center jointly sponsored by the National Electrical Contractors' Association (NECA) and the International Brotherhood of Electrical Workers (IBEW), on February 18, 2009. Spoke with apprenticeship instructors and outreach coordinators about health and safety training currently offered and green jobs.
- **Piping Industry Progress Education (PIPE)** trades apprenticeship training center headquarters on March 10, 2009. Spoke with apprenticeship coordinators and outreach coordinators about health and safety training currently offered and apprenticeship program outreach.

5. Workshops

- **Laborers International Union** – hazard awareness workshops to pilot ideas for adapting WOSHTEP to building trades. Riverside, California, March 29, 2008, with 40 participants; Las Vegas, NV, August 27, 2008, with 35 participants.
- **California Construction Academy** – a new Academy initiated by the UCLA Institute for Research on Labor and Employment and supported by SBTC. Attended Academy conferences in Southern California (July 18-19, 2008) and Northern California (November 21, 2008). Presented a workshop on health and safety at Southern California conference. Discussed UCLA Community Scholars Class and worker safety and health in green construction.
- **Women Building California Conference** – 2 workshops co-presented with Laura Boatman of SBTC, Building the Green Future, May 2, 2009, with 55 participants; Health and Safety, May 3, 2009, with 10 participants.

Appendix C: Health and Safety Training Materials

1. California Department of Public Health, Occupational Health Branch

Materials: Fatality Assessment and Control Evaluation (FACE) factsheets which include case studies of fatalities investigated in Los Angeles County: www.cdph.ca.gov/programs/ohb-face

Materials: BuildSafe California Safety Break Tailgate Training Cards
www.cdph.ca.gov/programs/ohb/Pages/BuildSafe.aspx

2. Commission on Health and Safety and Workers' Compensation

Website: <http://www.dir.ca.gov/chswc/chswc.html>

Materials: Worker Occupational Safety and Health (WOSH) Specialist Curriculum

Summary of activities currently included in the WOSH Specialist training materials which are construction-related:

Core Modules

Module 1: Promoting Effective Safety Programs

- Worksheet #2 – Looking for underlying causes - Joe's & Mary's stories

Module 2: Identifying Hazards in the Workplace

- Hazard mapping activity

Module 3: Controlling Hazards in the Workplace

- Hierarchy of Controls Game: David's story (adapt to construction ladder safety), James's story (laborer/heat illness), Gail's story (construction/electric shock)

Module 4: Health and Safety Rights and Responsibilities

- Worksheet #5 – What do you know about Cal/OSHA - adapt to construction standards

Supplemental Modules

Bloodborne Pathogens

- Worksheet #3- Solving Problems as a WOSH Specialist: Scenario #2 Exposure to Blood in a Warehouse Accident – adapt to construction setting

Chemical Hazards

- Whole module, minor adaptations to make construction-specific

Communicating Effectively

- Worksheet 1 – If the Glove Fits

Emergency Preparedness

- Case Study 3: Summer sun nearly kills construction worker

3. Occupational Safety and Health Administration (OSHA)

Materials: OSHA 10-hour and 30-hour training. Website: www.osha.gov

4. Smart Mark

Materials: Hazard awareness curriculum for the OSHA 10- and 30-hour training program.

International unions affiliated with the Building and Construction Trades Department and their employers continue to develop one-hour modules that are interchangeable, depending on the interests of each trade. Website: <http://www.cpwr.com/training-smartmark.html>

5. State Building and Construction Trades Council of California (SBCTC)

Materials: OSHA Focus Four hazards, Construction Hazards Education Project tailgate training, Hardhats United to Save Hearing (HUSH) hearing conservation program, among other topics. Website: <http://www.sbctc.org>

6. UC Berkeley Labor Occupational Health Program (LOHP)

Materials: Construction Safety – Tailgate Training Curriculum. Website: http://www.lohp.org/Projects/Construction_Safety/construction_safety.html

Appendix D: Sample Case Studies - DRAFT

Case Study 1: CRYSTAL'S STORY

Crystal is a 28-year-old apprentice. She had been working on a large new construction site constructing a pier for 4 months with three other workers when she was involved in a horrible accident.

Their job was to lay PVC piping underground in trenches. The project contractor began running behind schedule and the workers were directed to change the process. Instead of working from the vault out, they were instructed to lay the pipes from the ends of the trench and work towards the middle. Once the vaults were put in, they had to connect the pipes with PVC glue and make the pipe fit very tightly into the trenches. While they were trying to put a pipe in place, it sprung up and struck Crystal in the face.

Crystal's co-workers did not know what to do and could not decide who should drive her to the main trailer. Meanwhile, Crystal was kneeling in the trench looking for her teeth with blood all over her face. Frustrated, she climbed out of the trench, put her own icepack on her face and drove herself to the main trailer.

When she arrived at the trailer, there was no safety or emergency information including where the nearest hospital was. There were also no accident forms and the project manager did not know what to do. Since there were no radios, no one was able to contact the General Foreman. Again, Crystal had to drive around the work site to find him to figure out next steps and fill out an accident report.

Every Monday morning there were weekly safety meetings that covered basic issues but not emergency procedures. If workers on site were able to avoid accidents, they received "safety bucks" which they could use in buying merchandise from the contractor's catalogue.

Crystal was taken to an emergency room by the union steward who was on site. They found her front two teeth were knocked out, her lips were lacerated, and her face was burned by the PVC glue.

1. What went wrong in this situation?
 - Workers didn't know how to respond to a worksite accident.
 - There was no one in the trailer who could provide assistance.
 - There were no emergency numbers or workers comp clinic information posted.
 - There was no proper training on changes to the process of making pipe connections.
2. What can be done to prevent similar incidents from happening in the future? Which are the employer's responsibilities and which are the worker's responsibilities?

Employer:

- There should be safety trainings conducted on how to respond in an emergency.
- There should be clearly posted numbers/logs/forms for contacting supervisors and/or clinics, nearest hospital etc.
- There should always be someone present in the trailer who has authority to make decisions.
- Find an alternate method of connecting the pipes (i.e. slip couplings).
- Look for a green product that could be used instead of caustic chemicals.

Worker:

- Attend trainings that are provided.
- Report Hazards.
- Talk to co-workers and form a health and safety committee.

Case Study 2: BILL'S STORY (DRAFT)

Bill is a 32-year-old ironworker who was working on a new construction site. He and his partner Tony were the "detail gang" who did a variety of work on the site. One day, the regular foreman was not on the job site. The foreman on duty told them to connect a steel beam to a wall. They weren't able to do the job because there was a piece of rebar in their way. They were directed to move the rebar so they could make the connection. Bill and Tony used a concrete shoring post, which was not part of their usual equipment, to remove the rebar. While walking with the shoring post, Bill's body harness got hooked on something. As he bent down to untangle the harness, the 80-pound shoring post fell on his foot. Once Tony removed the post off of Bill's foot he was in so much pain he couldn't walk. Tony called Ed, the union steward, and they helped Bill into a buggy and took him to the trailer. After he filled out accident forms, Bill was taken to the Workers' Comp clinic for medical care.

1. What went wrong in this situation?

- No specific directions had been left by the regular foreman for the foreman on duty.
- Bill and Tony shouldn't have been using the shoring post because it wasn't their equipment and they hadn't been trained to use it.
- Bill's body harness got caught.

2. What can be done to prevent similar incidents from happening in the future?

- Train workers to be aware of hazards.
- Have an accident plan in place and train workers about how to respond to an emergency.

Case Study 3: MIGUEL'S STORY, **SOLAR PANEL INSTALLATION FATALITY³⁵ (DRAFT)**

Miguel was installing solar panels on a building in Los Angeles. He lifted up a metal bracket and it ended up touching high voltage electrical lines over his head. He was electrocuted and fell 35 feet from a scaffold to the ground. Miguel was badly injured and died.

Miguel's employer was a non-union solar energy contractor. He had worked for this company on and off for two years. The contractor had a safety program with written safety policies and a formal solar panel training program. The solar training covered some electrical hazards, but did not include how to recognize hazards or how to work safely around high-voltage electrical lines.

Miguel had been in the United States for five years. He was originally from Guatemala and spoke Spanish. Most of the routine job and safety instructions between company supervisors and Miguel were in Spanish. There were also written instructions on how to work safely for most tasks including lifting materials, but only some of these instructions were written in Spanish.

1. What went wrong?
 - Miguel wasn't informed of all potential worksite hazards, including overhead power lines.
 - All safety information was not provided in a language that Miguel could understand.
2. What should be done to prevent incidents like this? Which are the employer's responsibilities and which are the worker's responsibilities?

Employer:

- Employers should have safety programs that address all hazards and have procedures for doing regular job hazard analyses.
- Translate all safety materials in Spanish and ensure that any new workers receive language appropriate training on hazards including how to work safely around high voltage lines

Worker:

- Workers should organize and form a Health and Safety Committee



The high voltage lines in relation to the building



The top of the building where Miguel was working



Looking up from the ground to where Miguel was working

³⁵ California FACE Report #08CA006. January 27, 2009. <http://www.cdph.ca.gov/programs/ohb-face/Documents/08CA006.pdf>