

Chemical Facility Safety in an Era of Climate Change: Training for Worker Participation and Community Engagement

2014 WETP Spring Workshop Report

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INTRODUCTION

It is well recognized that one of the most alarming consequences of climate change is the growing intensity and duration of severe weather events. These events can have detrimental impacts on communities. Unfortunately, those who are often most impacted by weather-related disasters are vulnerable populations, including children, the elderly and disabled, and communities that are already disproportionately impacted by environmental hazards. Climate change-related severe weather events also pose potential risks for those who work in facilities that use high-risk chemicals and communities that are located in close proximity to such facilities. In an effort to improve the safety and readiness of these workers and communities nationwide, President Barack Obama issued two directives in 2013: Executive Order 13653, "Preparing the United States for the Impacts of Climate Change," and Executive Order 13650, "Improving Chemical Facility Safety and Security."

The National Institute of Environmental Health Sciences (NIEHS) Worker Education and Training Program (WETP), in partnership with the University of California, Los Angeles (UCLA) Labor and Occupational Safety and Health Program (LOSH), held a workshop in Los Angeles, California, on April 8, 2014, to discuss these executive orders and the implications for workers and communities. The workshop focused on the "Improving Public and Worker Safety at Oil Refineries" report prepared for the California Interagency Task Force on Refinery Safety, the "Executive Order 13650, Actions to Improve Chemical Facility Safety and Security – A Shared Commitments" report prepared for Obama, and what these reports mean for emergency responders and plant workers.

NIEHS also hosted a disaster response tabletop exercise (TTX) on April 7, 2014, in Los Angeles, California. The event brought scientists, state and local health organizations, community leaders, and federal, state and local government officials together to engage in a simulated response to an earthquake-induced tsunami and subsequent fire at a nearby oil refinery. Prior to the TTX, participants were taken on a tour of the region impacted by the simulated disaster to highlight the density and proximity of industrial plants in the region to homes. The TTX provided helpful context for the WETP workshop.

This report highlights the lessons learned, best practices and next steps for the WETP community discussed during the workshop as they relate to Executive Order 13653, Executive Order 13650 and responses to future disasters.

BACKGROUND

Executive Order 13653 and Executive Order 13650 share a common goal: preparing communities for disaster events to mitigate negative impacts on the environment and public health. These executive orders are also linked by the reality that the increasing severity of weather-related events attributed to climate change presents an increasing threat to high-risk chemical facilities. As a result, the WETP decided to address both executive orders during the workshop.

The implications of the executive orders for the WETP relate to its Hazardous Waste Worker Training Program. The potential dangers of climate change-related weather events and/or disasters involving high-risk chemical facilities suggest a need to examine current training curricula and identify opportunities where curricula might be updated to better prepare workers to respond to disasters of this nature. In addition, the WETP should acknowledge the need for curricula focused on training community members. Community members, including workers, are often among the first responders to disasters. These community members should be equipped with the information to ask their representatives the right questions, and prepared to respond safely.

Community member responder training for weather-related disasters and/or chemical facility disasters also has environmental justice implications. Communities that are often most impacted by weather-related disasters include a high percentage of vulnerable populations and/or are communities that are already disproportionately impacted by environmental hazards.

Executive Order 13653, "Preparing the United States for the Impacts of Climate Change"

Climate change-related weather events can have severe impacts on communities and the economy. Disaster preparedness is key to minimizing the negative impacts associated with such disasters. Executive Order 13653, issued November 1, 2013, directs federal agencies to assist communities in strengthening their resilience to severe weather events and preparing for other impacts of climate change.[1]

More specifically, Executive Order 13653 establishes a federal interagency Council on Climate Preparedness and Resilience, as well as a State, Local and Tribal Leaders Task Force on Climate Preparedness and Resilience. It also requires federal agencies to:

- Modernize federal programs to support climate-resilient investments.
- Manage lands and waters for climate preparedness and resilience.
- Provide information, data and tools for climate change preparedness and resilience.
- Plan for climate change-related risk.

1 The White House, Office of the Press Secretary, "Fact Sheet: Executive Order on Climate Preparedness," White House Press Release (November 1, 2013), http://www.whitehouse.gov/the-press-office/2013/11/01/fact-sheet-executive-order-climate-preparedness.

Given the WETP's experience with cleanup from other weather-related disasters—most recently Superstorm Sandy—Executive Order 13653's call to make communities more resilient to the impacts of climate change has significant relevance.

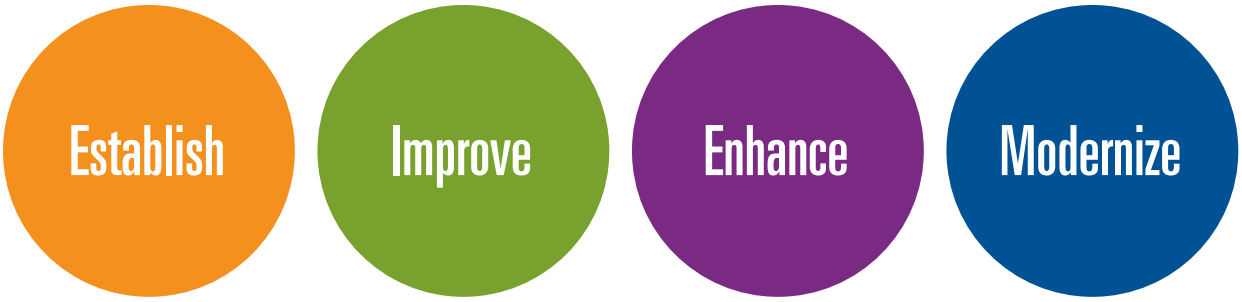
Executive Order 13650, "Improving Chemical Facility Safety and Security"

The president issued Executive Order 13650 on August 1, 2013. The introductory section points out that while "the Federal Government has developed and implemented numerous programs aimed at reducing the safety risks and security risks associated with hazardous chemicals," additional measures need to be taken by federal departments and agencies with regulatory authority "to further improve chemical facility safety and security in coordination with owners and operators."[2]

Executive Order 13650 directs the federal government to:

- Establish a federal interagency Chemical Facility Safety and Security Working Group.
- Improve operational coordination with state, local and tribal partners.
- Enhance federal agency coordination, information collection and sharing.
- Modernize relevant policies, regulations and standards.
- Work with stakeholders to identify best practices.[3]

Given the significant hazardous materials found in chemical facilities and their risk to workers, emergency responders and the surrounding communities, this executive order also resonates with the WETP. The program's grantees have been training workers from chemical facilities with regard to safety and health protections for years and the WETP has long monitored policies surrounding chemical facility safety and security.



2 The White House, Office of the Press Secretary, "Executive Order--Improving Chemical Facility Safety and Security," White House Press Release (August 1, 2013), http://www.whitehouse.gov/the-press-office/2013/08/01/executive-order-improving-chemical-facility-safety-and-security.

3 The White House, Office of the Press Secretary, "Fact Sheet: Executive Order on Improving Chemical Facility Safety and Security," White House Press Release (August 1, 2013), http://www.whitehouse.gov/the-press-office/2013/08/01/fact-sheet-executive-order-improving-chemical-facility-safety-and-securi.

DISASTER CASE STUDY: RICHMOND – CHEVRON FIRE

To ground the discussion on hazards related to weather-related events attributed to climate change and/or disasters involving chemical facilities, a case study on the 2012 Chevron Fire in Richmond, California, was selected as a point of focus. This disaster was selected because of its relevancy to the issue of high-risk chemical facility safety and the involvement of WETP grantees in the response effort.

On August 6, 2012, a corroded side-cut pipe at the Chevron Refinery in Richmond, California, ruptured releasing a flammable, hydrocarbon process fluid. Nineteen workers were exposed to a large vapor cloud. While all 19 employees escaped with minor injuries, the vapor cloud ignited producing a large plume of particulates and vapor that traveled across several surrounding communities. Approximately 15,000 people in the community sought medical treatment for respiratory stress, anxiety and eye issues associated with exposure to the chemical plume.[4]

The Bigger Picture

Prior to the August 6 event, several less severe incidents, including a shutdown due to a sulfidation corrosion concern, had prompted investigations and recommendations by Chevron technical staff. Chevron elected not to act.

Panelist Mike Wilson, California Department of Industrial Relations (DIR), commented that the Chevron incident serves as an example of a systemic problem with oil refinery safety in California and across the country. He noted that there is an urgent need for adequate attention and timely correction to avoid future incidents that threaten worker and community health and the environment.

Wilson identified three major contributing factors to the systemic problem:

- Many oil refineries are still operating using carbon steel pipes installed in the 1970s. This aging infrastructure is succumbing to sulfur corrosion, leading to an increased risk of incidents.
- The sulfur content of crude oil has increased in recent years. Inputs to refineries have increased from 1 percent to 1.5 percent between 1996 and 2012. The increased sulfur content increases corrosivity to refinery infrastructure.
- Management negligence and carelessness is commonplace. Management often ignores inspection recommendations regarding equipment updates.

Following the Chevron fire, Gov. Jerry Brown of California established the Interagency Refinery Safety Working Group to assess how to better protect the safety and health of workers and communities through improved oversight and emergency preparedness.

Wilson noted that industrywide problems of corrosion, aging infrastructure and managerial carelessness require solutions based on inherent safety in the hierarchy of controls:

- First-order inherent safety: safer chemicals.
- Second-order inherent safety: lower volume of chemicals.
- Passive layers of protection: corrosion-resistant piping.
- Active layers of protection: auto shutdowns.
- Procedural protections.

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4 U.S. Chemical Safety and Hazard Investigation Board, Regulatory Report: Chevron Richmond Pipe Rupture and Fire, Report No. 2012-03-I-CA (May 1, 2014), http://www.csb.gov/assets/1/7/Chevron_Regulatory_Report_05012014.pdf.

Implications for the WETP

The Chevron fire example provided context for a discussion involving panel members and workshop participants. Some of the major findings of the session included the following:

- There is an opportunity for WETP grantees to provide worker training and evaluation. For instance, most California Occupational Safety and Health Agency (CAL-OSHA) inspectors do not have a background on these issues, nor do they have experience with worker or community engagement.
- One of the fundamental problems is that the refinery industry does not have a "learning culture." There might be adherence to well-recognized industry standards, hence regulatory language will need to be grounded in actions that are part of the industry's own recommendations. Regulatory language must also consider if there are justifiable indicators of infeasibility. For instance, will an economic argument from industry be enough to persuade rule makers that an approach is infeasible?
- Requirements for contractor training, contractor health and safety performance, and contractor involvement in safety culture and assessments (in addition to these requirements for employees and their representatives) should be included in the draft regulation.

Lessons Learned: Commitment, Communication, Community

The 2012 Chevron fire is just one of the many incidents that illustrate an industrywide problem and the need for safer chemical facility management. Panelists Greg Karras, Communities for a Better Environment (CBE), and Mike Smith, United Steelworkers (USW) Local 5, emphasized the importance of involving workers and communities in the discussion about improving chemical facility safety.

The sometimes contentious discussions held after the incident between Chevron, unions and community organizations helped to identify important lessons to prevent future incidents. The findings included:

- Clear and timely communication with adjacent communities did not occur following the incident.
- Communities have long raised concerns about facility safety, insufficient emergency management plans and a lack of evacuation routes.
- "Safer refineries" means a safe and healthy environment for both refinery workers and residents in surrounding communities.
- Trust between all stakeholders is essential to realizing safer facilities and better emergency planning.
- It is important to establish relationships prior to disasters (e.g., USW and CBE) to identify safety concerns and develop emergency response plans.
- Unions need to be involved in safety-related planning and discussions.
- It takes unions and workers working together with communities to push for industry change in creating a safer and healthier facility.
- Chevron has begun focusing on projects and engaging in further discussions on how they can begin to ensure the safety of workers and communities.
- A successful collaboration should be based on three principles: commitment to community health and safety, worker rights and transparency.

Best Practices: WETP Awardee Involvement

Residents living in close proximity to the Chevron facility were among those most affected by the August 6 incident. They were also actively involved in response efforts.

Recognizing the inevitable role of residents as responders, panelist Dinorah Barton-Antonio, University of California Berkeley, Labor Occupational Health Program (LOHP), discussed LOHP's partnership with CBE to increase hazard awareness and train selected leaders on how to become meaningfully involved in decision-making processes regarding chemical facility safety management. This program consists of the following:

- A 10-week program including evening and/or weekend classes.
- Spanish language hands-on training.
- A toxic tour for participants and families, identifying the hazards in their community.
- Opportunities to present concerns to city council and other relevant decision-makers.

Moving Forward

The foundation for progress toward safer refineries for workers and communities has been laid. However, there is still much that needs to be done to move forward.

First, there is a need to build the principles of inherent safety into regulatory language to advance a new baseline for industry safety performance. Perhaps the most significant industry change regarding adoption of inherent safety would be to embrace a shift from large chlorine tanks to a chemical substitution. The California DIR is currently working to require companies to examine and evaluate the feasibility of adopting first- and second-order safety solutions, to document evaluation methods, and to adopt these solutions or provide justification for not doing so. The implementation of these requirements would support a shift toward inherent safety as a standard practice.

Second, workers must have the ability to be meaningfully involved in safety and health discussions and decision-making. Explicit language is being developed by California DIR to actively involve workers in any safety and health matters, as assessment of safety culture at any facility has to involve meaningful worker and community participation.

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CHEMICAL FACILITY SAFETY

Chemicals and the facilities that produce, process, utilize and store the chemicals are crucial to today's economy. Often, the characteristics that make chemicals hazardous are also the same characteristics that make them useful. To protect the workers and the nearby communities from these hazards, it is necessary to find ways to minimize the risks related to handling and storing these hazardous chemicals. Executive Order 13650 is an important first step toward enhancing the safety of communities around the U.S. regarding chemical hazards.

Investigations into past and recent tragic events at high-risk chemical facilities, including fertilizer plants and oil refineries, have found common safety issues leading to the catastrophic events. The investigations have also helped to identify lessons learned and recommendations to mitigate and reduce these disasters in the future.

Unfortunately, the multiplicity of such disasters indicates that high-risk chemical facilities are not taking safety seriously enough. Despite available information about risks, they are not adopting precautionary measures that would help to prevent these disasters that result in injury and death for workers and surrounding communities.

Implications for the WETP

Stakeholder Engagement

Workers, community members, industry leaders, federal, state and local agencies, and other stakeholders must work together in order to best protect workers and communities from potentially catastrophic disasters involving chemical facilities. Pre-disaster planning and training involving various stakeholders is an important component of sufficient emergency preparedness.

Stakeholders bring valuable and varied resources and insight to the table. For example, workers often have intimate knowledge of potential hazards. Community members can help identify concerns and challenges that might complicate response efforts involving residents. Industry leaders can provide additional technical knowledge about operations and they maintain an ability to adopt and implement best practices. Government agencies possess regulatory authority to compel industry to act, are responsible for coordinating response efforts and can provide additional technical assistance.

Community residents should be engaged in planning and decision-making processes, and provided with the information and training necessary to protect themselves in the event of an emergency.

Approaches to Safer and Secure Chemical Facilities

Kim Nibarger, USW, commented that the only real solution to making chemical facilities safer is to substitute dangerous chemicals for safer alternatives whenever possible.

Nibarger shared the USW's perspective of Executive Order 13650 and concerns related to the current Process Safety Management (PSM) standard. The PSM standard requires measures to be taken to prevent or minimize the potential for catastrophic releases of toxic, reactive, flammable or explosive chemicals. Nibarger noted that the PSM standard is flawed. He provided the following recommendations for improving the standard:

- Eliminate the Atmospheric Storage Tank Exemption and the Oil and Gas Well Drilling/ Servicing Exemption.
- Require additional Management System elements.
- Include a Recognized and Generally Accepted Good Engineering Practices definition.
- Expand the mechanical integrity of all safety-critical equipment.

Bill Hoyle, U.S. Chemical Safety and Hazard Investigation Board, and on assignment to the California DIR, noted that there is a need for a more sustainable model for improving the safety and health of high-risk facilities as normalization of deviance sets in and processes become ineffective. Hoyle added that it is insufficient to rely on regulation and enforcement of these facilities.

Hoyle and Tim Malloy, UCLA Law School and Sustainable Technology and Policy Program, advocated for the inherently safer design (ISD) approach. The ISD approach holds that, wherever possible, hazards should be eliminated, and where infeasible, companies should adopt "as low and reasonably practicable" (ALARP) approaches to reduce risks.

Malloy echoed Nibarger's remarks that removing hazards is the best way to enhance safety. Substitution for safer chemicals can also reduce regulatory costs. Furthermore, the ISD approach supports improved communication and cooperation across a variety of departments and disciplines within a firm. This interdepartmental communication can promote information sharing related to ISD feasibility, and financial incentives to adopt ISD (e.g., insurance costs, regulatory costs, etc.). Nevertheless, barriers to ISD adoption include: information gaps, cost characterization, methodological support, misconceptions, inertia, intra-firm communication and firm power/political structure.

Malloy also argued for the "safety case," which is a systematic hazard evaluation framework where the agency accepts the firm's "case" for safety. It applies the ALARP standard and moves toward continuous improvement without any rule change.

Best Practices: Need for Effective Safety and Health Training

Effective safety and health training for workers and community residents is an important component of pre-disaster planning and preparedness and reducing chemical facility disaster injuries, illnesses and fatalities. Some efforts to address accidents involving chemical hazards through worker safety and health training have already started to take place since the issuance of Executive Order 13650.

In an effort to curb tragic incidents in oil refineries such as the 2012 Chevron fire, California passed Senate bill 54 (SB 54), also known as the Hancock bill. The Hancock bill aims to reduce the prominence of underqualified workers in high-risk refineries. Under the law, by 2016, 60 percent of refinery contractors' workforces must be graduates of state-approved apprenticeship programs, which includes 20 hours of advanced safety training in Division of Apprenticeship Standards-approved curriculum. The law also requires local area fair wages. Cesar Diaz, State Building and Construction Trades Council of California, noted that SB 54 is a model program for other states.

Some labor organizations are also making efforts to ensure that workers are adequately trained and prepared for events involving chemical facilities. The International Association of Fire Fighters (IAFF) has a minimum operations-level training for member firefighters aimed at protecting the public and preparing for effective and safe response. Elizabeth Harman, IAFF, presented on the organization's training strategy which emphasizes the need for risk-based responses. The training program's design includes four elements: Analyze, Plan, Implement and Evaluate (AIPE) to ensure safe and competent response.

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Moving Forward: Recommendations

- To protect workers and communities from preventable incidents at high-risk facilities, panelists provided the following suggestions in addressing Executive Order 13650 directives:
- Pre-decision planning is a valuable practice and should be used to mitigate and reduce negative impacts from chemical facility accidents.
- There is a need for regional tools regarding community/worker engagement in planning and decision-making.
- The PSM standard should be improved to protect emergency responders. Such improvements include:
  - Updating Appendix A, List of Highly Hazardous Chemicals, Toxics and Reactives. Updating Appendix A would help in the identification of the facilities that utilize processes involving these chemicals or use them in the manufacturing process. It would also help identify where these materials may be stored on site, as well as where they are transferred at a facility to be distributed.
  - Facilities should be inspected annually, or required to hold drills annually. The annual basis for inspection or drills would enable the off-site responders to interact with the facility's personnel and stay current on the hazards present.
- Funding should be made available to those organizations that have made strides in developing programs for the Regional Response Teams in the "short term" and "medium term" as outlined in Executive Order 13650.
- Root cause analysis should be used to prevent repeat incidents.
- Risk communication should be translated in an easily understandable and effective manner.
- Stakeholder input on decision-making processes should be promoted and encouraged.

CLIMATE CHANGE AND HOW TRAINING CAN INCREASE WORKER AND COMMUNITY RESILIENCE

Recent extreme weather events attributed to climate change, including Hurricane Katrina and Superstorm Sandy, have highlighted the wide range of hazards that can emerge for workers and community members responding to such disasters. As climate change continues, the frequency and severity of these kinds of extreme weather events is expected to increase. There is an escalating need to ensure that both workers and community members are informed about how to best protect themselves and others from hazards while responding to weather-related disasters.

NIEHS WETP and Awardee Involvement

The NIEHS WETP has actively supported safety and health training for workers and community members responding to national disasters of various origin, scale and hazard exposure. Panelists shared with participants the response and recovery activities in which their organizations have engaged in the wake of Hurricane Katrina and Superstorm Sandy.

Hurricane Katrina Rebuilding Efforts

Dr. Beverly Wright, Deep South Center for Environmental Justice (DSCEJ), provided an overview of DSCEJ's involvement in the aftermath of Hurricane Katrina. Wright noted that the disproportionate impacts of severe weather-related disasters on minority and low-income communities are consistent with the disproportionate socioeconomic stress and environmental burdens these communities already face.

After Hurricane Katrina, DSCEJ directed its programmatic components and research efforts toward identifying solutions and providing technical assistance to communities along the Gulf Coast devastated by the disaster. Advisory boards were established in Atlanta, Georgia; Baton Rouge, Louisiana; Houston, Texas; and Jackson, Mississippi, to assist the large numbers of displaced New Orleans residents fleeing to these cities.

Supported by funding from the Ford Foundation and the U.S. Department of Housing and Urban Development (HUD), and in collaboration with labor unions, environmental organizations and other academic institutions, DSCEJ developed several safety and health training initiatives in these communities, including the Healthy Homes Project, Healthy Rebuilding Toolkits and Packet (Katrina Survivor's Project), and the Safe Way Back Home Project. The goal of these efforts was to build the capacity and knowledge of workers and residents displaced by the disaster to safely rebuild and return to New Orleans. The curricula developed to support these efforts helped to build community resilience to severe weather events associated with climate change.

Wright added that DSCEJ would be hosting the Second Annual Historically Black Colleges and Universities (HBCU) Student Climate Change Conference in New Orleans, Louisiana, on April 17-19, 2014. Under the theme Building Safe and Resilient Communities for All, the conference focused on climate change impacts and resilience in vulnerable communities and provided students at HBCUs with opportunities to engage with researchers and scientists about the expected impacts of climate change. The annual conference raises awareness about the disproportionate impact of climate change on vulnerable and marginalized communities, and is designed to develop the next generation of leaders on issues related to environmental justice policies, community resilience and adaption.

Superstorm Sandy Recovery and Rebuilding Efforts

Panelist John Morawetz, International Chemical Workers Union Council (ICWUC), discussed the safety and health training response in the aftermath of Superstorm Sandy. He noted that the response effort was complicated by a regional capacity overload, including large numbers of volunteers. Morawetz noted that most volunteers appeared to have general awareness of various hazards; however, most had little or no training on confined spaces or asbestos. Also, there was no medical monitoring system to track health concerns.

Morawetz informed workshop participants that future ICWUC efforts will include continued "muck and gut" training, train-the-trainer courses, and developing additional safety and health guides for workers, volunteers and residents.

Implications for WETP Training and Training Target Populations

Additional Training Efforts

While the impacts of climate change are generally acknowledged, most people do not experience a significant impact on their daily lives. Thus, they do not feel an urgent need to change behaviors that may be contributing to the problem.

Hillary Godwin, UCLA Department of Environmental Health Sciences and Institute of the Environment and Sustainability, noted that one good way to motivate people to change behaviors is to educate people about the health impacts of climate change on an individual and family level. A better understanding of the health impacts of climate change can help to mobilize communities to identify and address resiliency issues.

Godwin highlighted the Climate and Health Workshop series from the County of Los Angeles Department of Public Health's Five-Point Plan to reduce the health impacts of climate change while building healthy, sustainable and resilient communities. These train-the-trainer workshops discuss core aspects of climate change, including specific impacts on health, regulatory and other policy issues, and also involve a brief seminar and brainstorming activities aimed at mobilizing public health officials and the population to prepare for climate change impacts.

Rebuilding Effort Training Considerations

As the number of weather-related disasters increases, there will be a growing need to provide training to workers who clean up after disasters and residents preparing to return to their homes. Effective safety and health training and capacity building will be essential to prevent and reduce injury and illness resulting from these events. Training organizations will need to consider the wide range of hazards workers and residents may be exposed to following weather-related disasters attributed to climate change, and develop curricula and training to prepare these individuals for safe recovery and rebuilding efforts.

Panelist John Ferris, U.S. Environmental Protection Agency (EPA), provided an overview of the Hurricane Sandy Rebuilding Strategy, which includes guidelines for resiliency investments using federal funds and recommendations for rebuilding efforts.

The goals of this strategy provide a good model for rebuilding efforts following climate change-related disasters. The goals include:

- Aligning funding with local rebuilding visions.
- Providing families, businesses and communities with efficient and accountable support.
- Coordinating federal, state and local efforts.
- Ensuring the region is rebuilt to be more resilient, to withstand future storms.

New Job Opportunities

As climate change continues and more weather-related disasters occur, the need for responders and cleanup workers will increase.

WETP awardees will need to adapt training efforts to reflect climate change impacts on workers' careers. Panelist Gary Gustafson, LIUNA Training and Education Fund (LIUNA Training), noted that LIUNA members are concerned about how their jobs might be affected by climate change and weather-related disasters.

LIUNA Training has developed curricula designed to provide workers with a diverse skill base that can also be adapted to support a wide variety of disaster response efforts, including demolition. This approach prepares LIUNA members with the technical training required to take on and safely perform jobs that often emerge from disaster situations. LIUNA workers arrive with technical knowledge, and ready to receive site-specific training, before engaging in response efforts.

Moving Forward: Best Practices and Lessons Learned

Several best practices and lessons learned regarding response efforts to climate change-related disasters emerged from previous experiences. Panelists noted the following:

- Collaborations between unions, worker organizations and communities are valuable to efforts to build communities more resilient to climate change.
- Public health officials, workers and community members require a better understanding of how climate change-related events can adversely impact health.
- Every disaster is different. Hazard analyses should be performed following each event.
- Training during disasters can be a challenge. Access to workers and volunteers can be very limited. Cleanup activities often become prioritized over the need to first train those doing the cleanup work.
- Requests/opportunities for training should be explored, but limited resources require judgment calls on what can be provided.
- The hazards and responders vary from disaster to disaster. These event-specific conditions must be considered when designing curricula and providing training to workers responding to a specific disaster.
- Limited resources are commonplace. Leveraging resources with other agencies and organizations can help to sustain training and capacity-building efforts.

As climate change continues and more weather-related disasters occur, the need for responders and cleanup workers will increase.

WRAP-UP

Gina Solomon, Deputy Secretary for Science and Health, California EPA, noted the importance of research and data collection to support safety and health hypotheses.

Solomon noted that lessons learned from previous disasters have helped responders to better address issues that have emerged in more recent disasters. It is important to engage and work with communities living in impacted areas. They can provide valuable insight and information to aid response efforts.

Working closely with communities can lead to improved training and response efforts, and help to inform research about how communities can increase resilience to weather-related disasters and/or disasters involving chemical facilities.

There is a clear need to increase worker and community capacity and preparedness to respond to climate change-related events and/or disasters involving chemical facilities. And while not all disasters can be prevented, impacted stakeholders including workers, communities, industry, researchers and government officials must work together to help communities prepare for and mitigate impacts related to these kinds of events.

Comprehensive safety and health training curricula that acknowledges concerns related to these issues is a vital part of building community preparedness and resilience to incidents attributed to climate change and/or involving chemical facilities.

NEXT STEPS

The WETP has a clear interest in the impacts of climate change on workers' safety and health, including the impacts that climate-related weather events can have on chemical facilities and those who live near and work in them. The WETP is in the process of developing a climate change vulnerability assessment to better understand the impacts of climate change on its program. In addition, an October 2014 workshop will explore the broader implications of climate change to occupational safety and health. These efforts aim to help workers and communities better prepare for the impacts they are likely to face.


NIH
National Institute of
Environmental Health Sciences