

Installer Safety 101

A SEIA webinar in association with the Interstate Renewable Energy Council as the National Administrator of the U.S. Department of Energy Solar Instructor Training Network.

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Introduction

Christine Covington
Solar Energy Industries Association

SEIA Installer Safety & Workforce Development Working Group

- **Sharing Information & Best Practices**
 - Educational webinars
 - Sessions at PV America and other solar shows
- **Coordination with OSHA**
 - Advisory Committee on Construction Safety & Health
 - Industry representation for codes and standards

Agenda

Karl Riedlinger

- **What is safety?**
- **Safety, compliance & the law**

Carlos Ramirez

- **Safety program basics**
- **PV installation safety basics**

Solar Safety Introduction

Karl Riedlinger
Chair, SEIA Installer Safety & Workforce
Development Working Group



What is safety?

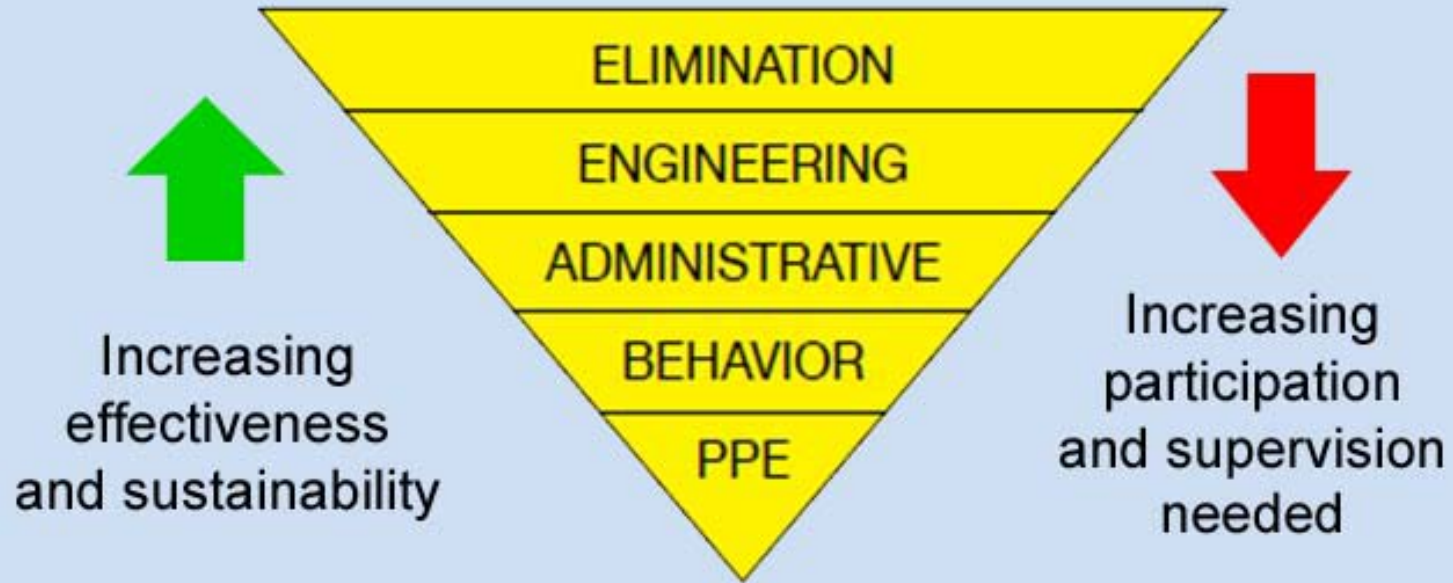
What is safety?

- **A definition of Safety:**

- The implementation of passive and active controls to remove or reduce exposure to hazards.
- The adherence to rules that dictate and govern safe behavior.
- An attitude of awareness and caution for yourself and others in everything you do.

- **Workplace safety is *the law*.**

Hierarchy of Hazard Control



- The highest level of protection should always be implemented for any hazard.
- Responsibilities are shared with 'the company' and 'workers' each having a role



Safety, Compliance & the Law

Occupational Safety & Health Act

Section 5 - Duties:

(a) Each employer –

- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
- (2) shall comply with occupation safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupation safety and health standards and all rules, regulations, and orders issued pursuant to the Act which are applicable to his own actions and conduct.

Compliance – state or federal OSHA?

- Multi-state employers face the problem of employing companywide safety standards to meet differing regional requirements.
- Similar to dealing with differing permitting requirements of AHJs.



There are currently 22 States and jurisdictions operating complete State plans (covering both the private sector and State and local government employees) and 5 - Connecticut, Illinois, New Jersey, New York and the Virgin Islands - which cover public employees only. (Eight other States were approved at one time but subsequently withdrew their programs).

Navigating the Regulations

- **Once you know whether you are under state or federal OSHA, it takes effort to understand all the sections of code that apply to the work being performed.**
 - Now knowing the code is not an excuse to be in violation.
 - It is the burden of the employer to implement the safety laws that govern the work.
 - It is the burden of the employer to make sure all its employees understand and follow that safety laws at all times.
- **Outreach and consultation services are available from the private safety consulting industry or OSHA Consultation without fear of reprisal.**

Winning Hearts and Minds

- One of the biggest hurdles an employer faces is changing the behavior of people who would act unsafe if left to their own methods.
- If individuals are unwilling to follow the established safety policies it is still ultimately the responsibility of the company to maintain a safe workplace.
- It is OSHA's stance that "workers don't hurt themselves, employers allow them to get hurt"
- Employees need to "buy-in" to the culture of safety and not allow coworkers to work unsafely.

How to be OSHA Compliant – 3 tips

- Know, understand and implement the laws and best practices covering all workplace hazards.
- OSHA regulations are not only suggestions, they are *the law*.
- OSHA regulations are only a starting point for working safely (like the NEC or other building codes) – they set minimum requirements which we often need to supplement to complete work.



PV Installation Safety Basics

Carlos Ramirez
Senior Director of Safety, SolarCity



Safety Program Basics

What is needed from employers

- **Safety-minded leadership starts at the top and is present in every level of operations and visible in every task performed.**
- **Willingness to put worker safety higher on the priority list than competing goals (maximum profit, etc.)**
- **Safety program implementation, management, and oversight**
 - Metrics to measure and improve
 - Field audits
 - Firm enforcement of policies
- **Documented installation and safety policies and practices**

What is needed from employers (con't)

- **Training, training, training!**
- **Properly equipped offices and crews**
 - Full safety gear, regularly inspected and replaced if necessary
 - Easy access to safety policies and process documentation
- **Support from safety leadership to solve problems**
- **Have a safety plan for the work to be performed before work starts, have everyone in-site trained to the plan.**
- **Make safety part of the culture, everywhere, all the time, for everyone.**

How to create a Safety Program – 3 tips

- **Identify all the hazards and risks of tasks being performed (Job Hazard Analysis, Activity Hazard Analysis)**
- **Use industry best practices to address hazards under the hierarchy of control.**
- **Make a safety plan to address all hazards.**
 - Train all workers on the safety plan.
 - Implement the safety plan.
 - Monitor the safety plan.
 - Enforce the safety plan.



PV Installation Safety Basics

PV Installation Safety Basics

- **All plans in place PRIOR to performing work**
 - Hazard Assessments
 - Training Plans
 - Emergency Plans
 - What hazards can a worker typically be exposed to?
 - Falls, Weather conditions, shock, strains, insects and wildlife, working around heavy equipment etc.
 - Plan what to do if an accident occurs.

PV Installation Safety Basics (con't)

- **Train AND Document**

- Workers need to be trained on:

- Hazard Assessments

- Training Plan

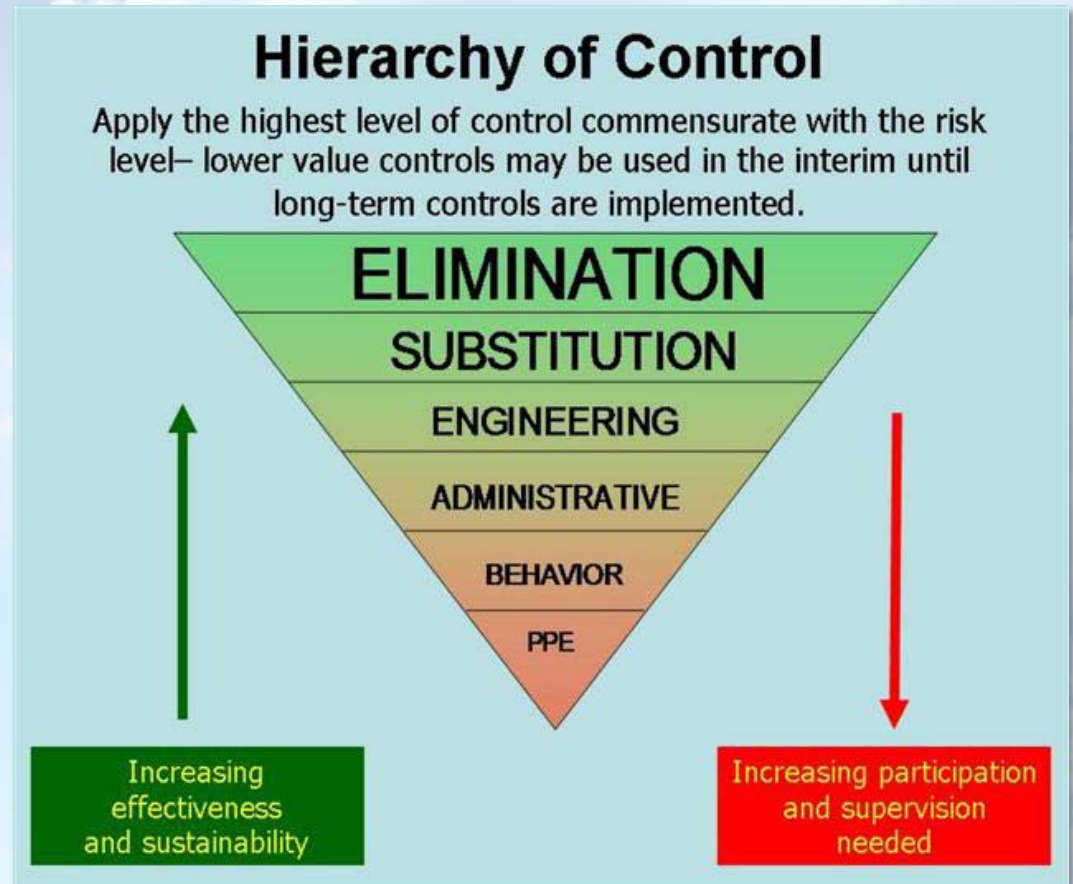
- Emergency Action Plan

- Workers need to be **QUALIFIED** to perform the tasks that pertain to the job

- All training needs to be documented and made available upon request of the Client and OSHA

PV Installation Safety Basics (con't)

- Always follow the hierarchy of controls for all work performed.
 - Eliminate the hazard
 - Substitution:
 - Is there a less hazardous material that can be used?
 - Roof access - stair tower vs. ladder?



PV Installation Safety Basics (con't)

- **Defensive driving and Driver Qualifications**
 - Driver training on-site as well as off-site
 - Seatbelts
 - Speed limits in place and enforced
 - Material storage secured
 - Aisles cleared and other housekeeping
 - Vehicle maintenance program in place
 - Spotter used as needed when equipment backing up, are back up alarms operational?
 - Vehicles over 10,001 lbs GVWR require registration with DOT FMCSA and possibly participating states
 - DOT Physicals
 - Drivers logs

PV Installation Safety Basics (con't)

- **100% Fall Protection all the time**
 - Fall Protection required anytime workers are exposed to a fall from a height of 6' or greater
 - Rescue plan in place where PFAS's used & workers trained
 - Guardrails, constructed in accordance with 1926.502(b)
 - Personal fall arrest systems
 - Training and periodic inspections conducted by a competent person
 - Personnel must be trained to recognize fall hazards
 - PFAS components inspected before use

PV Installation Safety Basics (con't)

- **Electrical Safety**
 - **Cord sets properly inspected and have ground prongs**
 - **GFCI's used**
 - **Electrical tools inspected and in good condition**
 - **Work only on de-energized circuits**
 - **Lock-out/Tag-out (LOTO) Circuits**
 - **Arc-flash Hazard Assessment complete**
 - **PPE used**

PV Installation Safety Basics (con't)

- **Ladder safety**
 - Properly setup and secured, maintained and inspected, type and use of ladder selected for best application
 - Workers trained in ladder safety
- **It is a violation of OSHA regulation 1926.1053 (b)(22) to carry tools or panels up a ladder by hand.**
- **Material handling**
 - Minimize risk when transporting and storing materials
 - Forklift and equipment inspected prior to use
 - Proper lifting techniques used
 - Loads secured on pallets
 - Use machinery to lift panels tools and equipment to the roof
 - Pick-up & landing plans when cranes used

PV Installation Safety Basics (con't)

- **Personal Protective Equipment (PPE)**

- OSHA requires that Hazard Assessments be completed for the selection of PPE
 - Assessments documented and workers trained in the selection and use of PPE
- Gloves selected based on the hazard (ex: cut resistant)
- Safety glasses, Hardhats, foot protection
 - Meet applicable ANSI standards.
 - Standard sunglasses do not meet ANSI Z.87 standard
- Hearing protection as needed
 - Based on noise levels over time exposed per 8 hrs. (1910.95 table G-16)

PV Installation Safety Basics (con't)

- **Weather-related Illness/Injury Prevention & Environmental Exposures**
 - Awareness training: look for signs of heatstroke or hypothermia
 - Potable water available
 - Shaded or heated rest areas and clothing suitable for the weather, loose fitting light colors for summer, layers for winter.
 - Severe weather concerns
 - Thunder storms
- **Sanitation – facilities are required (1 restroom/20 workers) & hand washing stations.**

Further References & Resources

- **Federal OSHA Standards for the construction industry**
 - [29 CFR – 1926 OSHA Construction Industry Regulations](#)
- **Cal-OSHA Standards for the construction industry**
 - [CCR Title 8 Construction and Electrical Safety Orders](#)
- **Find your state's OSHA regulations**
 - <http://www.osha.gov/dcsp/osp/index.html>
- **ANSI - American National Standards Institute**
 - <http://www.ansi.org/>



**SEIA
INSTALLER
SAFETY**
Seminar + EXPO

February 14-15, 2012
Westin Mission Hills Resort & Spa · Rancho Mirage, California

- **Mark your calendar!**
- **Call for Presentations closes Sept. 30, 2011**
 - Anyone may submit an idea
 - Contact Leah Bernick at lbernick@seia.org
 - Go to:
www.seia.org/events_education/installer_safety_seminar_presentations
- **This two-day intensive seminar includes education sessions and networking opportunities in an intimate business setting.**

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Thank You!