



Renewable Energy: A Need for Renewed Safety Compliance

By Paul J. Colangelo

While the economic downturn has had a very negative effect on historically strong industries such as construction and manufacturing, there has been rapid growth in the expanding renewable energy sector. Along with this tremendous growth, has been the realization of a significant increase in deaths and disabling injuries on renewable energy projects.

One recently published OSHA accident investigation highlights a major concern with renewable energy:

In 2010, workers were performing routine maintenance on a wind tower. During the maintenance procedure, one worker unexpectedly energized a transformer, causing an arc flash that directly exposed another worker to the direct blast. The injured worker suffered third degree burns to his neck, chest and arms, and second degree burns to the face. OSHA cited the company for failure to ensure that technicians working on the wind tower followed Control of Hazardous Energy procedures, commonly called Lockout/Tagout, on the tower turbine switch gear. In addition to the tremendous lifelong pain and suffering the victim must endure, and the life of guilt the co-worker must live with, OSHA issued the company six citations for willful safety violations with proposed fines totaling \$378,000. This is just one example where OSHA required safety training and procedures were not in place, resulting in a catastrophic event.

In a recent statement, Secretary of Labor, Hilda L. Solis was quoted as saying, "Green jobs are an important part of our economy, and sectors such as wind energy are growing rapidly. That growth comes with a continued responsibility for employers to ensure that the health and safety of workers is never compromised. Employers must not cut corners at the expense of their workers' safety." She has been quoted saying "Our message is simple: "Safety pays and falls cost. So Plan, Provide and Train."

OSHA requires that each of their "Focus Four" categories is included as primary training topics in their OSHA 10 Hour training course. Why you might ask? These "Focus Four" topics represent the four leading causes of preventable death in the construction industry. The categories representing the highest fatality rates are Falls, Electrical Hazards, Struck By and Caught in Between hazards. Each of these four "high risk" hazards is present during all photovoltaic, solar thermal and wind tower construction projects, large and small. Many states, such as California, have started a "Green Energy" safety focus based on the number and severity of injuries that are occurring. State inspectors across the US are finding an increasing trend in the lack of proactive safety planning/job hazard analysis, availability of Personal Protective Equipment, employee training and a host of other areas of non-compliance. Federal OSHA has taken note of this as well, and they are effectively and justifiably educating their compliance officers on renewable energy hazards.

Protecting your Employees and your Company:

The development and implementation of a quality safety program is a minimum requirement for any company owner or leader that seeks to run a reputable business. By far, the best companies ensure they hire experienced workers and train them in safe work procedures and all safety requirements before they are allowed to enter a hazardous work environment, such as a construction site. Taking the time and effort to ensure your safety program is effective and



engaging your employees in the overall safety program is the best defense possible against preventable injuries and incidents.

What other processes do successful companies use to protect their employees and reduce their overall risks? Proven methods of protecting employees and reducing overall risk that your competition is probably using include:

Fall Prevention - Pre-Job and Pre-Task Planning: This includes site specific safety plans, fall protection plans, Pre-Task Plans, Job Hazard Analysis, and any other tool designed to identify and mitigate worksite fall hazards. Planning safety into your work will prevent injuries and incidents. For example, many renewable energy projects are loaded with fall protection hazards. Sadly, although a variety of fall preventive and protective systems are available; many times they are either never procured, not utilized in a proper or effective manner or the fall hazards are ignored all together. For flat roof tops, warning lines at 6' have been used as a cost effective solution, however, that is a roofing only solution and the 6' setback rule does not apply to renewable energy sector. Portable guardrails are by far the most effective and less restrictive solution. Many manufacturers and providers offer rent to own programs for this equipment. For all rooftop types, personal fall arrest and restraint systems also offer significant protection, however, employee training and proper use must always be a top priority as many fall victims are found wearing their fall harness, neglecting to "tie off" before their exposure to a fall.

Due to the complex nature of many PV, solar thermal and wind tower projects, there isn't a one manufacturer and model fits all solution for fall protection and restraint systems. Renewable energy providers must take a serious look at the harnesses, specialized anchorage attachments, (such as mobile fall protection carts), associated equipment and employee training when planning for these projects.

System Design- More and more renewable energy providers, especially those engaged in photovoltaic installations, are faced with an ongoing struggle in attempting to engineer fall hazards out of a project, but knowing that precious roof space is vital to a system's capacity, that option is not always feasible. Designing safety into a rooftop as-built is always a wise choice. Examples include keeping a 10-15' set back from all exposed roof edges, and including fall protection and skylight protection barrier graphics would greatly and proactively assist project managers in preparing for these hazards. Also, many inverter manufacturers have already begun to engineer smart safety designs into their equipment.

Electrical Hazards and NFPA 70E:

Electrical hazards are prevalent on all renewable energy sites. Many of the personnel working on these projects have heard of Lockout/Tagout, but give a blank stare when asked about compliance with NFPA 70E. NFPA 70E is a consensus standard that is authored and published by the National Fire Protection Association (NFPA). If you are not enforcing the requirements of NFPA 70E, your employees and your company are taking unnecessary risks. Educating yourself in the methods and protections required under this very important standard is critical. Many new changes have been published in the new 2012 NFPA70e standard that affect qualified person verification, written job hazard analysis, AC and DC arc flash, incident energy calculations, establishing correct flash boundaries, lockout tag out, PPE, labeling and design.



Struck By & Caught In Between:

When you take into account the high volume of equipment operating on renewable energy projects, combined with the large number of employees and subcontractor personnel presence, struck by and caught in between hazards are of constant concern. Struck by and caught in between hazard awareness training and equipment operator training and certification, is crucial to eliminate these extremely preventable injuries. In addition, with the amount of crane activity always in progress, companies must educate their staff on OSHA's Subpart CC crane standard.

Effective Safety Cultures start with Leadership: In order to establish an effective safety culture, business owners and company leaders must include effective safety requirements in their bids. An assumption that all work will be performed safely and with regard to compliance does nothing to ensure that a safe project will result. Include all employees in the creation and education of the safety program; allow them to have a voice and support that safety program with management presence (not supervision) in the field often enough to solicit their feedback and concerns with regard to safety. Always provide positive recognition to those employees that are following and supporting the rules and provide coaching and mentoring to those that don't. An effective reward and recognition program is critical to show appreciation and value to those that help provide a safe work place. A fair and consistent disciplinary system is also needed to ensure those that don't or won't comply with the safety program, do.

Subcontractor management- This could be one of the biggest areas that if improved upon, would significantly reduce the occurrences of project incidents and injuries. Many renewable energy companies have now shifted to a subcontractor turnkey model for commercial projects, and have now found themselves engaged in one of two battles. The first is making the mistake of thinking that once a project is handed off to a subcontractor, your safety responsibility was handed off as well. For those who feel that is the case, I highly encourage them to review OSHA's Multiple Employer Worksite Citation Policy, especially regarding correcting and controlling employer responsibility. The second understands that many of these subcontractors are inexperienced with renewable energy projects, and fail to recognize common safety hazards that exist on these projects.

Leadership States and Organizations- There is some good news here. Many states, like Oregon, have established associations such as **OSEIA**, the Oregon Solar Energy Industries Association, by stepping up their attention and commitment to the renewable energy sector with cutting edge safety information. **OSHA**, the Occupational Safety and Health Administration, has focused on its green energy initiative, and many helpful links are available on their website <http://www.OSHA.gov/dep/greenjobs/index.html>. Other organizations, such as **AWEA**, the American Wind Energy Association, are working with OSHA and NIOSH in its research and development on wind tower safety. More information can be found at www.AWEA.org. And ClickSafety, the leading online safety training company, continues to task its content team in the development of renewable energy safety information that is offered in the form of white papers and specialized online training programs. More information can be found at www.ClickSafety.com.

Renewable energy has raced its way into the mainstream, and has become the beacon of hope for clean energy solutions worldwide. However, let us not forget that safety and its associated gamut of endless hazards does not turn a blind eye to any industry, no matter how politically or fundamentally popular in its application. The first word in renewable is renew, and renew is that



exact ideology we must all apply toward safety compliance for each and every one of these projects.

Bio of author: Paul Colangelo, National Director of Compliance Programs at ClickSafety.com

Paul is responsible for the effective operations of the compliance programs department. He leads Compliance Programs product development, manages daily program operations and partners with sales personnel to enhance customer safety programs. He is a certified AHA Core instructor with 13 years of experience as an accredited OSHA Outreach 10- and 30-Hour Construction program trainer, and is obtaining ARM and CHST certifications. Paul has over 20 years of experience as Safety Director, Manager and Consultant to Construction, Telecommunications, Utility and Renewable Energy sectors. He has created and delivered hundreds of Outreach and specialized training programs across the country.