

# TerranearPMC Safety Share

## **Week of August 20, 2012 – Health and Safety in a Green World**

Within recent years we have seen the term *Green Jobs* become a household expression. Yet how well has this term been defined? It seems that if we talked to ten people, we would get ten different responses. The Centers for Disease Control has defined Green Jobs as being a broad category of occupations that helps to improve the environment. And while these jobs may be creating opportunities to help revitalize our economy, green jobs do not necessarily mean that they are safe jobs. Workers in green industries may face hazards that are commonly known in standard work environments. Such hazards include falling from heights, work in confined spaces, electrical, fire, and exposure to toxic materials. Such conditions may be new to many workers who are moving into these fast-growing industries and therefore they are not prepared or trained in the proper control methods necessary to protect themselves. For example, workers in the solar energy industry may be exposed to *cadmium telluride*, a known carcinogen. If adequate controls are not implemented, we could be facing a new wave of occupational incidents; just at a time when there have been major advances in the areas of hazard identification, assessment and mitigation.

The Occupational Safety and Health Act (OSH Act) requires employers to comply with safety and health standards and regulations promulgated by OSHA or by a state with an OSHA-approved state plan. In addition, the Act's General Duty Clause, Section 5(a)(1), requires employers to provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm. In the absence of an OSHA standard, OSHA can enforce the General Duty Clause. OSHA standards cover many of the hazards in green industries and employers must use the necessary controls to comply with these standards and therefore, protect workers. However, if this new and upcoming industry is unaware of the hazards inherent within its various work environments, many workers could be facing unfortunate consequences; all at the expense of not understanding their own work environment.

During a recent Going Green Workshop sponsored by the National Institute for Occupational Safety and Health Assistant Secretary of Labor, Dr. David Michaels (head of OSHA) committed to helping workers and employers ensure that green jobs are safe jobs.

A key concept for all industries, but especially those that are just beginning to grow, is "Prevention through Design" or PtD; designing the process/equipment in a way that eliminates hazards to the workers who use them. Employers should have a system in place where safety and health professionals work with design engineers in "designing out" hazards throughout the planning phase of their products.

While recycling is good for the environment, it can be dangerous for workers. In 2008, the U.S. Environmental Protection Agency (EPA) estimated that of the 250 million tons of waste generated in the U.S., approximately 1/3, or 83 million tons, was recycled or composted. Certain materials that are recycled or reused, such as scrap metal, electronics, batteries, and used oil and other chemicals, pose hazards to workers. In addition, there are some hazards that are common across various types of recycling, such as traffic safety, lifting injuries, and slips, trips, and falls.

Other jobs emerging within the green sector include renewable energies such as solar energy, wind energy, hydropower, bioenergy, marine wave and tidal energy, and geothermal energy. Solar, wind and biomass energies are the most commonly used. Some physical hazards that workers face when installing solar panel systems are similar to those in construction, but are new to electricians and plumbers installing Photovoltaic (PV) panels or solar water heaters on roofs. These may include falls from heights, manual handling (ergonomics, lifting, and pinch points, etc), high temperatures, confined spaces and electrocution during construction and maintenance. And there is an additional health hazard for fire-fighters and residents due to airborne inhalation of chemical fumes released from burning photovoltaic modules in case of fire in buildings. Concentrating Solar Power (or CSP) uses the sun's rays to heat a receiver which creates mechanical energy to generate electricity, as opposed to PV, which uses direct conversion with semi-conductors. Occupational hazards in this industry are embedded in the construction and maintenance of industrial scale installations, such as electrical hazards, high temperatures and hazards from concentrated sunlight. PV cell manufacture also involves a number of cleaning agents which may be toxic. Consequently, workers involved in manufacturing photovoltaic modules and components must be protected from exposure to these materials.

In addition to these occupational hazards within the manufacturing and installation activities, there is a concern from the end of life waste disposal of PV panels. More than 15 hazardous materials are used in the manufacture of PV panels. Many hazards may arise from the chemicals used in conjunction with silicon in various manufacturing processes. These new products currently have an end-of-service life estimated at 20 to 25 years.

Wind power generation has seen tremendous growth over the past decade and continued growth is expected. The types of jobs include project development, turbine component manufacturing, construction, installation, operation and maintenance of wind turbines. The type of hazards and risks in the manufacture of windmills are similar to those in the automobile industry and aerospace installations, while hazards and risks concerning their installation and maintenance are similar to those in construction. Workers may be exposed to chemical hazards from exposure to epoxy resins, styrene and solvents, harmful gases, vapors and dusts and physical hazards from moving parts, as well as manual handling in blade manufacturing and maintenance. There is a risk of exposure to dust and fumes from fiberglass, hardeners, aerosols and carbon fibers. Common health related problems include dermatitis, dizziness, sleepiness, liver and kidney damage, blisters, chemical burns, and reproductive effects. Physical hazards during maintenance, are include: falls from heights, musculoskeletal disorders from manual handling, and awkward postures when working in confined spaces, physical load from climbing towers, electrocution, and injuries from working with rotating machinery and falling objects. Estimates on accidents, injuries and diseases are uncertain due to a lack of available statistical data. However, the Bureau of Labor and Statistics is starting to categorize incidents within these industries.

It is clear that this new, emerging industry, while given a name that conjures up beauty and a promise of a bright and environmentally responsible future, may cause some unforeseen problems for workers. While the intentions of the green industry can prove to be everything we hope it will be, we must not forget that people in this industry could be paying a price that is contrary to what this business sector's name implies.

***Let him who would move the world, first move himself***

Socrates