

Megan Locatis

All the Gears: How an Array of Nuclear Energy Workers Make Life as We Know it Possible

Last year, nuclear energy constituted 19.6% of all electricity generated in the United States (Nuclear Energy Institute--U.S. Nuclear Power Plants). In a society where our lives and electronic devices have become irreversibly intertwined, this is a colossal contribution. Not only do we rely on electricity to power our social networking and leisure activities (video games, YouTube, and more), but we also depend on it to keep society as we know it running smoothly. Businesses and the government all rely on computers and the Internet to effectively communicate in a timely fashion. Can you imagine how slow the bureaucracy and businesses would be without the convenience of e-mail, faxing, scanning documents, and phone calls? It would take months just to plan one meeting, to order one book!

We rely on electricity for everything from heat to light to transportation—and much, much more. And the future lies in technology—so we will only become more dependent on electricity and energy, if anything. And with this dependency comes responsibility; we can't ruin our earth in the process of feeding our energy needs. Each year, burning fossil fuels contributes 23 billion tons of carbon dioxide to the atmosphere (Comby); this increase in greenhouse gases leads to greater retention of heat from the sun, meaning an increase in overall global temperature—a change that could potentially have a deadly impact on our environment and ecosystems. Nuclear energy, on the other hand, contributes relatively little to greenhouse gas emissions—just 21 grams of carbon dioxide per kilowatt hour, compared to the 1017 generated by coal and the 575 by natural gases (Comparative Carbon Dioxide Emissions from Power Generation). And one gram of uranium yields about as much as one ton of oil or coal (Comby)—meaning that nuclear power really packs a punch when it comes to efficiency. Nuclear energy is

the future of clean energy; not only does nuclear fission produce large quantities of energy using only very small quantities of uranium, it also is sustainable—some waste produced by nuclear energy can even be recycled into fuel (Comparative Carbon Dioxide Emissions from Power Generation). Nuclear energy is, and will continue to be, a major contributor to energy production in the United States and around the world; it is a key element in making our day to day lives possible on multiple levels.

But nuclear power would not be a reality without the dedication and skill of hundreds of workers at each nuclear plant. These workers perform vital tasks that ensure energy is produced safely and efficiently, making this clean fuel source a possibility. Engineers lead the industry into the future by drafting new designs for plants, envisioning changes that would ensure improved performance and safety or reduce production costs even further to make nuclear energy an even more marketable option (NUCLEAR POWER). Pipe layers are vital to the function and safety of power plants; they lay the pipe work that channels water heated by fission out of the reactor core, as well as the pumps and valves that would bring in cold water to cool the core in case of a meltdown (Nosowitz). Line workers lay electrical lines and ensure that the energy produced can be converted into electricity and carried from the nuclear plant to homes, schools, hospitals, and businesses for use (NUCLEAR POWER). Without these workers, a nuclear power plant simply wouldn't function.

Nuclear energy workers are key parts of our community and society as a whole; they continue to advance safety and efficiency of power plants, make safe, clean, affordable energy a possibility. We live in a time when dependency on foreign fuel (particularly fossil fuels) is a real problem that affects our daily lives. This dependency is a contributor to the economic crisis we find our country in. Nuclear power plants provide jobs and a reliable source of domestic energy,

and skilled workers in this field are the ones who see to it not only that nuclear energy remains a viable source of electricity, but that the field expands and continues to improve our lives by preventing the crisis from spiraling out of control. Nuclear energy workers are like small gears; each group has a specific job that it oversees, and each specific job contributes to the smoothness of the power plant overall. Without engineers to continually advance the design and safety of power plants, disasters, even meltdowns, would be an inevitable reality. Without line workers to create an intricate web of power lines, we would have no means of delivering the power to homes, businesses, hospitals, schools, and more. Without technicians to radiograph structures and equipment, damage to the integrity of the plants and the machines in them would go unnoticed, and disaster would be sure to follow (Nuclear Technician Job Description). Other workers and surrounding areas would be at risk for unhealthy dosages of radiation were it not for health physics technicians, because without these techs radiation levels at nuclear plants would go unmonitored (Nuclear Technician Job Description). The actual nuclear reactions that produce the energy would never occur without operators, because it is they who maintain and control the reaction as well as assist in handling and disposal of waste (Nuclear Technician Job Description).

And it is only through the combination of these workers that nuclear energy is safe and a real possibility as an energy source. A great amount of skill is required to ensure that operations at a nuclear plant are smooth; in a day and age when electricity is the conduit to society itself as well as the metaphorical nervous system of our industry, government, and private lives, these skilled workers certainly make a great deal of difference.

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Nuclear Power

People of today's society work hard to make our communities great places to live. Doctors find new medicines to cure complex diseases, teachers help children begin a lifetime of learning, garbage collectors keep neighborhoods clean. But almost every aspect of modern life requires some source of energy, from performing advanced medical tests, to working on computers, to driving through cities or towns. While scientists and inventors endeavor to find innovative ways to make sustainable energy sources cost effective, nuclear energy technology has already proven to be affordable, safe, and has a much smaller carbon footprint than traditional fossil fuels (Moens, 2011). Nuclear power is very energy rich, with each ton of uranium providing more than one million times the energy generated by a ton of coal or natural gas (EIA, 2011). This gives nuclear power an important role as people try to cut back on greenhouse gas emissions.

Nuclear power plants are run by highly skilled men and women. These employees serve their communities in three important ways. They provide reliable electricity at very little cost to the environment. They also ensure the safety and security of the nuclear plant, and they participate in community activities outside of their jobs.

Each nuclear power plant that has been built has become an integral part of people's lives. The nuclear power plant in Michigan provides millions of homes, thousands of businesses, and many transportation and health systems with electricity (Kulp, 2010). If Palisades Nuclear Power Plant were to be closed, it would take 1.2 billion dollars to restore the lost energy to everyone (Kulp, 2010). Without being on the power grid, hospitals would have to run on generators, which are not nearly as efficient nor as clean as power plants (Bernier, 2011). Police would struggle to keep up with criminals taking advantage of darkened houses and streets (GNA, 2010). Deprived of electricity, people would have no way to keep food cold, which would jeopardize their health due to accelerated bacteria growth (NDDIC, 2008). Furnaces and air conditioners would not function, so people would have no way to get warm or cool down. New electric lines would have to be put up at significant cost to support the different energy load (Kulp, 2010). Additionally, the millions of dollars in state and local taxes paid by the company would have to be found some other way (Kulp, 2010). The employees of all nuclear power plants work hard to make sure our lives stay normal by producing the electricity that keeps society running.

Although the safety of nuclear power plants is sometimes questioned, companies work very hard to make sure that people come to no harm. Line workers constantly maintain the power lines, making sure electricity is safely carried to homes and businesses (U.S Bureau of Labor and Statistics, 2007). Employees at the plant are carefully trained to use all of the specialized equipment (NEI, 2011). Others are on the job making sure nuclear power plants are operated in ways that meet federal safety standards (NEI, 2011). There are also people at the plant who, every day, verify that daily activities and programs are performed correctly, along with inspectors who routinely check the overall programs (Kulp, 2010). If an accident were to happen, staff would immediately take action to get the situation under control (Kulp, 2010). Special drills are conducted to ensure everybody is safe were a nuclear emergency to occur (Kulp, 2010). To ensure the security of the plant, access is restricted and there is around the clock monitoring to make sure only trained workers are around the reactors (NEI, 2011). Nuclear power plant employees work hard to make sure that no one harmed by the radioactive materials used to generate the electricity that keeps life going normally.

Employees are very active within their surrounding communities to support the quality of life. Employees have formed groups to help Habitat for Humanity build homes for families in need (Kulp, 2010). They donate to local organizations such as food pantries, performing arts centers, schools and conservancies (Exelon, 2011). Many companies are very active in community improvement, meetings and service projects (Kulp, 2010). The nuclear station in Huntersville, North Carolina, held a concert on it's lawn that attracted nearly 10,500 people (Duke Energy, 2011). They also had approximately five-hundred Boy Scouts camped on the property learning about healthy environmental habits (Duke Energy, 2011). In South Carolina, the Oconee Nuclear Station sponsors a movie series. Employees at the Catabawa Nuclear Station participate in a pen pal program with local schools (Duke Energy, 2011). Employees in most power plants also provide information to service groups, schools, and senior citizens about nuclear energy (Duke Energy, 2011). They help people understand nuclear power by making free videos available to the public, giving presentations, workshops and creating displays (Duke Energy, 2011). When people tour a nuclear facility, employees often volunteer their time to ensure things go smoothly and any questions are answered (Duke Energy, 2011). Nuclear power plant employees share their time, expertise and money to build stronger communities.

Like other people across America, every day workers at nuclear power plants go to work to help build better lives for themselves and their children. Theirs is a very important role both in their company and in their community: giving us the energy we need to stay healthy and comfortable, keeping us safe and working with us to improve society.

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Jessica Barjaktarovich
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Underappreciated: The Nuclear Professional

The advancement of our nation and the world is predicated on the availability and reliability of its energy sources. Energy is the fuel that drives any modern day economy. With this said, I believe that the nuclear industry and its professionals will turn out to play a major role in fulfilling the future development of the world.

The nuclear industry is influential on most people's day-to-day life. However, it seems as though the nuclear industry is often vilified in different forms through the media. Their mishaps are often times magnified and scrutinized by the media, while their benefits are frequently overlooked. I believe that a lot of the disdain and leeriness about nuclear energy strings back from the devastation seen in the bombing of Japan in World War II, and more recently, the damage caused by the tsunami in Japan and the plant accident in Chernobyl, Russia in the late 80's. The professionals in the industry have a tough road ahead of them. They are fighting an uphill battle of negative views that are placed upon them. So far, it is of my opinion that the nuclear industry has done a remarkable job at providing safe and reliable energy to those who demand it. Rarely do you hear about incidents involving deaths or accidents caused within the industry. Conversely, mishaps and misfortunes do not seem to be all that uncommon in the coal and oil industries nowadays. Mining is a dangerous job that has its casualties, along with the oil industry. For example, the recent oil spill in the gulf placed many professionals in the oil industry under hazardous conditions. Nevertheless, due to the perseverance of their workers, the nuclear industries rate of incidents is unparalleled with the rest of the energy industries. Yet, they remain un-trusted to the point where they are often times

overregulated. Parts of the nuclear industry today are regulated to the point where innovation within the industry is being stifled.

The number one source of energy used in the United States today is oil. The problem that arises from this is the fact that oil is susceptible to unpredictable market swings due to dependence on foreign countries. Unlike fossil fuels, nuclear energy has the advantage of less dependence due to our efficiencies in the industry. I believe that it is important for professionals in the field of nuclear energy to remain steadfast. They have the difficult task of swaying public belief that nuclear energy is safe and efficient. This is because we are not solely market driven. Opinion, emotion, and impression all play a major role in the decisions made in society, such as what our primary energy source will be. An industry will not win simply based on the fact that their source is more efficient. It also has to be accepted and supported by society.

With this said, I find it both courageous and praiseworthy of those who continue to expand the nuclear industry. Due to all of negative implications that seem to be stacked up against the industry, it would only be logical for it to begin to slowly die away. Here is where I believe the diligence of those active in the nuclear profession are truly making a difference in our society. Who knows where we will be in twenty or thirty years when it comes to our primary source of energy. What I do know is that nuclear energy will be a viable option for us to choose from if oil or coal begins to fail us. This option is at hand because of those remaining dedicated and persistent in the industry and I commend them for that.

The nuclear industry is often times found in the tough position of having to operate under the conditions of zero tolerance for failure. Yes, using nuclear energy has

its risks, just like any other source of energy. However, to move forward as a society we must bear some risk. As of right now, the industry has proven to have an amazing track record of producing efficient energy while minimizing most of the risks. Nonetheless, my belief is that their work will prove to make a substantial difference in the energy industry in the coming years.