PUBLIC REACTIONS TO NUCLEAR POWER pdf

1: Nuclear Energy is the most certain future source.

The fact that familiarity increases public support for nuclear energy is apparent from the very favorable attitudes of people who live near nuclear power plants. In addition to national surveys conducted at least twice a year, NEI sponsors biennial surveys of people living within a mile radius of any US nuclear power plant.

Nuclear fission is the process that is used in nuclear reactors to produce high amount of energy using element called uranium. It is the energy that is stored in the nucleus of an atom. While being environmentally friendly is the big plus of nuclear energy, disposal of radioactive waste and protecting people and environment from its radiations is a big cons of nuclear energy. Therefore, expensive solutions are needed to protect mother earth from the devastating effects of nuclear energy. When we think about this resource, many of us think about nuclear bombs or the meltdowns that have happened at a number of nuclear plants around the world. That being said, nuclear energy is definitely a type of renewable energy that we need to look at. Pros of Nuclear Energy 1. Nuclear power also has a lot fewer greenhouse emissions. It has been determined that the amount of greenhouse gases have decreased by almost half because of the prevalence in the utilization of nuclear power. Nuclear power produces very inexpensive electricity. The cost of the uranium, which is utilized as a fuel in this process, is low. Also, even though the expense of setting up nuclear power plants is moderately high, the expense of running them is quite low low. The normal life of nuclear reactor is anywhere from years, depending on how often it is used and how it is being used. These variables, when consolidated, make the expense of delivering power low. Even if the cost of uranium goes up, the impact on the cost of power will be that much lower. It is estimated that with the current rate of consumption of uranium, we have enough uranium for another years. A nuclear power plant when in the mode of producing energy can run uninterrupted for even a year. As solar and wind energy are dependent upon weather conditions, nuclear power plant has no such constraints and can run without disruption in any climatic condition. There are sure monetary focal points in setting up nuclear power plants and utilizing nuclear energy in lieu of traditional energy. It is one of the significant sources of power all through the country. The best part is that this energy has a persistent supply. It is broadly accessible, there is a lot in storage, and it is believed that the supply is going to last much, much longer than that of fossil fuels that are used in the same capacity. More Proficient Than Fossil Fuels: The other primary point of interest of utilizing nuclear energy is that it is more compelling and more proficient than other energy sources. A number of nuclear energy innovations have made it a much more feasible choice than others. They have high energy density as compared to fossil fuels. The amount of fuel required by nuclear power plant is comparatively less than what is required by other power plants as energy released by nuclear fission is approximately ten million times greater than the amount of energy released by fossil fuel atom. This is one the reason that numerous nations are putting a lot of time and money into nuclear power. Coal and natural gas power plants discharge carbon dioxide into the air, which causes a number of environmental issues. With nuclear power plants, carbon emissions are insignificant. Nuclear energy is not renewable resource. Uranium, the nuclear fuel that is used to produced nuclear energy is limited and cannot be produced again and again on demand. On the other hand, by using breeder and fusion reactors, we can produce other fissionable element. One such element is called plutonium that is produced by the by-products of chain-reaction. Also, if we know how to control atomic fusion, the same reactions that fuel the sun, we can have almost unlimited energy. Cons of Nuclear Energy 1. One of the biggest issues is environmental impact in relation to uranium. Actually transporting nuclear fuel to and from plants represents a pollution hazard. As a rule, a nuclear power plant creates 20 metric tons of nuclear fuel per year, and with that comes a lot of nuclear waste. When you consider each nuclear plant on Earth, you will find that that number jumps to approximately 2, metric tons a year. The greater part of this waste transmits radiation and high temperature, implying that it will inevitably consume any compartment that holds it. It can also cause damage to living things in and around the plants. Nuclear power plants create a lot of low-level radioactive waste as transmitted parts and supplies. Over time, used nuclear fuel decays to safe radioactive levels, however this takes a countless number of years. Even low level radioactive waste takes hundreds of years to achieve adequate levels of safety. The radioactive

waste produced can pose serious health effects on the lives of people as well as the environment. The Chernobyl accident that occurred on 26 April at the Chernobyl Nuclear Power Plant in Ukraine was the worst nuclear accident in the history. Its harmful effects on humans and ecology can still be seen today. Then there was another accident that happened in Fukushima in Japan. Although the casualties were not that high, but it caused serious environmental concerns. At present, the nuclear business let waste cool for a considerable length of time before blending it with glass and putting away it in enormous cooled, solid structures. This waste must be kept up, observed and watched to keep the materials from falling into the wrong hands and causing problems. These administrations and included materials cost cash â€" on top of the high expenses needed to put together a plant, which may make it less desirable to invest in. It requires permission from several international authorities and it is normally opposed by the people who live in that region. Just like other sources of fuel, uranium is also finite and exists in few of the countries. It is pretty expensive to mine, refine and transport uranium. It produces considerable amount of waste during all these activities and can result in environmental contamination and serous health effects, if not handled properly. Hot Target for Militants: Nuclear energy has immense power. Today, nuclear energy is used to make weapons. If these weapons go into the wrong hands, that could be the end of this world. Little lax in security can be brutal for humankind.

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2: International reactions to the Fukushima Daiichi nuclear disaster - Wikipedia

Public Opinion and Nuclear Waste Policymaking / Michael E. Kraft, Eugene A. Rosa, and Riley E. Dunlap 2. The Historical Development of Public Reactions to Nuclear Power: Implications for Nuclear Waste Policy / Eugene A. Rosa and William R. Freudenburg.

Frequently Asked Questions What is a web browser? Web browsers are software programs that allow you to search for information on the Web. Click on this link to find out which browser you are currently using: Why do I need to update my browser? Duke Energy recommends the following browser versions to ensure continued secure use of Duke-energy. How do I upgrade my browser? From the list of web browsers , click the browser you wish to upgrade. Should you require assistance with the upgrade, please refer to your browsers website for troubleshooting tips. Unfortunately, Duke Energy will not be able to assist you with your personal browser upgrade. What can I do? Here is a screenshot of the Advanced tab in Internet Explorer. What do I do if my operating system is not compatible? Some older machines have older operating systems that may not be compatible with newer browsers. If you are unable to upgrade your browser due to your operating system, you will need to visit your operating system providers website for information and support. What is an operating system? Examples of mobile operating systems for phones and tablets include Android, iOS, Fire, and Blackberry. Please visit the website for your operating system for details on upgrading and troubleshooting. The following link is a free diagnostic tool to help you identify your operating system. You can pay by phone for a fee by calling the General Customer Service contact numbers provided above. You can report your outage by texting OUT to You can also report your outage by calling the Report an Electric Outage contact numbers provided above.

3: Chernobyl | Nuclear Reaction | FRONTLINE | PBS

Three Mile Island and Chernobyl represent extreme instances of the problem that seems to trouble the American public more than any other about commercial nuclear power: its apparent danger. But.

It recommends safety standards, but member states are not required to comply; it promotes nuclear energy, but it also monitors nuclear use; it is the sole global organization overseeing the nuclear energy industry, yet it is also weighed down by checking compliance with the Nuclear Non-Proliferation Treaty NPT. When reports of the damaged nuclear power plants at Fukushima emerged, many countries looked immediately to the IAEA for more information. But its initial reports provided scant and at times contradictory information from Japanese sources and it took a week for the IAEA to dispatch a team to Japan to gather more facts on the ground. Olli Heinonen has said that "Fukushima should be a wake-up call to re-evaluate and strengthen the role of the IAEA in boosting nuclear safety, including its response mechanism". This repeated a widely held criticism in Japan that "collusive ties between regulators and industry led to weak oversight and a failure to ensure adequate safety levels at the plant". Once power was completely lost, critical functions like the cooling system shut down. Three of the reactors "quickly overheated, causing meltdowns that eventually led to explosions, which hurled large amounts of radioactive material into the air". The meeting was hosted by the International Atomic Energy Agency and focused on the Convention on Nuclear Safety that came into being in the wake of the Three Mile Island accident and Chernobyl disaster. Level 7 is the most serious level on INES and is used to describe an event consisting of "a major release of radioactive material with widespread health and environmental effects requiring implementation of planned and extended countermeasures. Gunter stated that the disaster could not be called an accident because it was the outcome of a "gamble [that] has been going on since the dawn of the nuclear age". Beyond Nuclear began a campaign to shut these reactors down on 13 April It said that the disaster in Japan has demonstrated the limits of human capability to keep dangerous technologies free from accidents with catastrophic results: This applies to nuclear weapons as well as to nuclear power reactors. Vessels risk facing extra delays for checks at subsequent destinations if they pick up even trace contamination. An official of the NSA said that high radioactivity levels detected by the NGO could not be considered reliable, although some members of Greenpeace stressed that their numbers corresponded in other areas. Members of Greenpeace stressed that there has been distrust of the official data, and that their contention was not the radiation levels, but the action that was taken. In Germany, demand for renewable energy has increased among private consumers. Russian authorities were reported on 15 March to be ready to evacuate the Kuril Islands and Sakhalin , if needed. On 20 March, Swedish citizens in Tokyo were recommended to begin taking potassium iodide as a precautionary measure. This recommendation was lifted on 29 March. Perry Kendall, urged residents not to stockpile the tablets. A team of Ukrainian nuclear specialists was reported on 17 March to be ready to fly out to realize this. Readings from aerial survey conducted by United States federal agencies after the Fukushima accident Three days after the earthquake, the U. Furthermore, the high levels of ground contamination at the site are raising concerns about the viability of individuals to work at the site in coming decades. The alert came in addition to the red outbound travel alert for the rest of Japan. No radiation has been detected. On 29 March the travel advice eased to only apply to non-necessary travel. After the Fukushima disaster begun, radiation monitoring activities increased across the country but radiation levels remained normal. The protesters were also opposed to plans to extend the lifespan of three existing nuclear plants. Taiwan is on the West Pacific Rim earthquake zone, like Japan. This was part of a nationwide "No Nuke Action" protest, urging the government to stop construction of a Fourth Nuclear Plant and pursue a more sustainable energy policy. The Taiwan Environmental Protection Union, together with 13 environmental groups and legislators, gathered in Taipei with banners that read: They also called for "all nuclear power plants to be thoroughly re-evaluated and shut down immediately if they fail to pass safety inspections". According to Wang To-far, economics professor at National Taipei University , "if a level-seven nuclear crisis were to happen in Taiwan, it would destroy the nation". Only 43 percent of those polled after the Fukushima nuclear emergency said they would approve building new power plants in the United States. The

demonstration was held to show support for the thousands of Japanese people who are endangered by possible radiation from the Fukushima I nuclear accidents. Vermont Yankee and Pilgrim have designs similar to the crippled Japanese nuclear plant. Buffet said that the "United States was poised to move ahead with nuclear plans here, but the events in Japan derailed that". NRC chairman Jaczko visited the plant and said afterwards "that there was no longer enough energy in the reactors at the crippled Fukushima No. Organisers called it the biggest anti-nuclear demonstration the country has seen, with police estimating that , people turned out in Berlin alone. Hamburg, Munich and Cologne also saw big demonstrations. In the Government had just prolonged the retention period of nuclear power plants which were scheduled to be phased out in by the nuclear phase-out plan of In light of the Fukushima disaster, the Government changed its mind: A physicist by training and a former environment minister, Merkel understood what Fukushima meant. Germany has 17 reactors, providing 23 percent of the electrical power in the country and making it the sixth largest nuclear electricity producer in the world. In record time, what once was the most pro-nuclear German government in decades prepared comprehensive legislation to phase out the remaining nine reactors by at the latest, starting in In June, parliament overwhelmingly passed the law in favor, 79 against, 8 abstentions. But in the wake of the Fukushima crisis, antinuclear rallies drawing thousands have erupted in Italy, and the Italian government has "decided on a one-year moratorium on its plans to revive nuclear power". Demonstrators, many with signs that read "No nuclear power, neither here nor in Japan", gathered in small groups in more than 30 cities, including Madrid, Barcelona, Seville and Valencia. Demonstrators marched peacefully near the Beznau Nuclear Power Plant , the oldest in Switzerland, which started operating 40 years ago. TEPCO was blamed for its conduct during and after the disaster. There were insufficient measures to prevent environmental damage and it was impossible to move the company to different behavior. After all attempts of the ABP to change the attitude of the company had failed, all stock was sold in the first week of Mexico has sidelined construction of 10 reactors in favor of developing natural-gas-fired plants. The state government of West Bengal state has also refused permission to a proposed MW facility near the town of Haripur that intended to host six Russian reactors. He also stated that "In addition to renewable energy, nuclear energy is clean and low cost". Quebec Premier Jean Charest issued statements that the Gentilly-2 reactor was safe, and the Canadian Nuclear Safety Commission declared it could withstand earthquakes. The opposition urged a meeting on the plans with the Minister of Mines and Energy, Laurence Golborne. President Obama and aides for former Senator Domenici publicly supported continued development of new U. We are blessed with abundant sources of renewable energy, of clean energy, of solar, wind, tide, hot rocks. Australia has no nuclear power stations. However, our decision on development of more nuclear power plants and current arrangement on nuclear energy development will not be changed. Also, Rodong Sinmun reported, "The situation of the nuclear plant accident get worse and worse every day, and made the international society worry greatly". After the Fukushima disaster, opposition against the plans started to emerge. Sabah al-Ahmad al-Jaber al-Sabah, emir of Kuwait, issued an order to dissolve the national nuclear energy committee. Besides the opposition, Kuwait is a small country, and it would be difficult to find a safe place for the nuclear waste the reactors would produce. Besides the cooperation with Japan, Kuwait did sign agreements on atomic energy with the United States, France and Russia. He emphasized both coolant and containment and compared these measures to reviews of the financial system after the banking crisis of All nuclear power plants in the Union were planned to be subject to an assessment and it was also hoped plants of neighbouring countries were taken into account. The evaluation would include " vulnerability to seismic events, their exposure to flooding, as well as man-made disasters such as power cuts and terrorism , with special attention being paid to cooling and back-up systems. The initial conclusions are expected by the end of President Nicolas Sarkozy has stressed the need for dialogue but said that France had chosen nuclear power for reasons of energy security and to counter greenhouse gas emissions. This protest had long been scheduled for 12 March, which now happened to be the day of the explosion of reactor block 1. Netherlands â€" Maxime Verhagen , Minister of Energy, Agriculture and Innovation, wrote in a letter to the House of Representatives that the experience of Japan would be taken into account in the definition of the requirements for a new nuclear power plant to be built in

PUBLIC REACTIONS TO NUCLEAR POWER pdf

4: How Nuclear Power Works | Union of Concerned Scientists

Add tags for "Public reactions to nuclear power: are there crit. masses?[this book is based on a symposium that was held at the AAAS annual meeting in Washington, D.C., Jan.]".

How Nuclear Power Works Principles of nuclear power Atoms are constructed like miniature solar systems. At the center of the atom is the nucleus; orbiting around it are electrons. The nucleus is composed of protons and neutrons, very densely packed together. Hydrogen, the lightest element, has one proton; the heaviest natural element, uranium, has 92 protons. During fission, a neutron bombards a uranium atom, releasing more neutrons and triggering a chain reaction. Because uranium atoms are so large, the atomic force that binds it together is relatively weak, making uranium good for fission. In nuclear power plants, neutrons collide with uranium atoms, splitting them. This split releases neutrons from the uranium that in turn collide with other atoms, causing a chain reaction. This chain reaction is controlled with "control rods" that absorb neutrons. In the core of nuclear reactors, the fission of uranium atoms releases energy that heats water to about degrees Farenheit. This hot water is then used to spin turbines that are connected to generators, producing electricity. Mining and processing nuclear fuels An open pit uranium mine in Namibia. One pound of uranium has as much energy as three million pounds of coal. Radioactive elements gradually decay, losing their radioactivity. The time it takes to lose half of its radioactivity is called a "half life. Uranium is found in a number of geological formations, as well as sea water. To be mined as a fuel, however, it must be sufficiently concentrated, making up at least one hundred parts per million 0. Wyoming and the Four Corners region produce most U. The mining process is similar to coal mining, with both open pit and underground mines. It produces similar environmental impacts, with the added hazard that uranium mine tailings are radioactive. Groundwater can be polluted not only from the heavy metals present in mine waste, but also from the traces of radioactive uranium still left in the waste. Half of the people employed by the uranium mining industry work on cleaning up the mines after use. The Department of Energy estimates that the U. American power plants are using over 40 million pounds of uranium fuel each year. Much more uranium is likely to be available beyond our proven reserves. Uranium comes in two forms, U and U As found in nature, uranium is more than 99 percent U; unfortunately, U is what is used in power plants. U can also be processed into plutonium, which is also fissionable. Once mined, the uranium ore is sent to a processing plant to be concentrated into a useful fuel. There are 16 processing plants in the US, although eight are inactive. Most uranium concentrate is made by leaching the uranium from the ore with acids. Sometimes the concentrate is made underground, without removing the uranium ore. When finished, the uranium ore is turned into U3O8, the fuel form of uranium, and shaped into small pellets. The pellets are then packed into foot long rods, called fuel rods. The rods are bundled together into fuel assemblies, ready to be used in the core of a reactor. Nuclear reactors There are currently 99 commercial nuclear reactors in operation in the United States. Over a dozen commercial reactors have been shut down permanently, with more retirements likely to be announced in coming years. Most of the plants in operation are "light water" reactors, meaning they use normal water in the core of the reactor. Different reactor technologies are in use abroad, such as the "heavy water" reactors in Canada. In a boiling water reactor, shown below, the water is allowed to boil into steam, and is then sent through a turbine to produce electricity. In pressurized water reactors, shown below, the core water is held under pressure and not allowed to boil. The heat is transferred to water outside the core with a heat exchanger also called a steam generator , boiling the outside water, generating steam, and powering a turbine. In pressurized water reactors, the water that is boiled is separate from the fission process, and so does not become radioactive. After the steam is used to power the turbine, it is cooled off to make it condense back into water. Some plants use water from rivers, lakes or the ocean to cool the steam, while others use tall cooling towers. The hourglass-shaped cooling towers are the familiar landmark of many nuclear plants. For every unit of electricity produced by a nuclear power plant, about two units of waste heat are rejected to the environment. Commercial nuclear power plants range in size from about 60 megawatts for the first generation of plants in the early s, to over megawatts. Many plants contain more than one reactor. The Palo Verde plant in Arizona , for example, is

made up of three separate reactors, each with a capacity of 1, megawatts. Some foreign reactor designs use coolants other than water to carry the heat of fission away from the core. Canadian reactors use water loaded with deuterium called "heavy water" , while others are gas cooled. One plant in Colorado , now permanently shut down, used helium gas as a coolant called a High Temperature Gas Cooled Reactor. A few plants use liquid metal or sodium. Nuclear waste Experimental tunnels at the Yucca mountain waste repository site. Nuclear Regulatory Commission By the end of , over 67, metric tons of highly radioactive waste had been produced by American nuclear reactors. That increases by about 2, metric tons every year. Before the mids, the plan for spent uranium was to reprocess it into new fuel. Since a by-product of reprocessing is plutonium, which can be used to make nuclear weapons, President Carter ordered the end of reprocessing, citing security risks. Reprocessing also had a difficult time competing economically with new uranium fuel. Since then, the Department of Energy has been studying storage sites for long-term burial of the waste, especially at Yucca Mountain in Nevada. Although Yucca Mountain has yet to be officially chosen, there are no other sites being considered. Meanwhile, radioactive waste is being stored at the nuclear plants where it is produced. The most common option is to store it in spent fuel cooling pools , large steel-lined tanks that use electricty to circulate water. As these pools fill up, some fuel rods are being transferred to large steel and concrete casks, which are considered safer. In addition to the spent fuel, the plants themselves contain radioactive waste that must be disposed of after they are shut down. Plants can either be disassembled immediately or can be kept in storage for a number of years to give the radiation some time to diminish. Most of the plant is considered "low level waste" and can be stored in less secure locations. Currently, only two sites accept low level waste: Barnwell in South Carolina and Hanford in Washington. A number are in storage awaiting decommissioning at a future time. The rise of nuclear power The principles of nuclear power were formulated by physicists in the early 20th century. In , German scientists discovered the process of fission, triggering a race with American scientists to use the incredible power of fission to create a bomb. Through the intense effort of the Manhattan Project, the atomic bomb was created by , and used to destroy Hiroshima and Nagasaki at the end of World War II. After the war, "great atomic power" was seen as a potential new energy source. As late as the s, bombs were being set off above and below ground to test different ideas. That job would be done with H-bombs having a total power of 42 megatons. To build it with conventional explosives would cost nearly six billion dollars -- using nuclear blasts just a little over two billion. Excavating, which took almost 20 years for the old Canal, might take only five for the new one. A more successful use of atomic power was in nuclear reactors. Admiral Hyman Rickover guided the development of small reactors to power submarines, greatly extending their range and power. The USS Nautilus was launched in By the late s, nuclear power was being developed for commercial electric power, first in England. Morris, Illinois, was the site of the first U. A plant at Shippingport, Pennsylvania, went on line in , but was not commercially owned. The head of the Atomic Energy Commission, Lewis Strauss, said in that "it is not too much to expect that our children will enjoy in their home electrical energy too cheap to meter. As a result, many of the early safety concerns about nuclear power were suppressed. Any consideration of the long-term effects and hazards were downplayed. This started a trend of "turnkey" nuclear plantsâ€”plants that were sold to utilities only when fully completed. Such turnkey plants enabled the nuclear industry to get off the ground, with plant orders booming in the late s. The fall of nuclear power After absorbing as many losses as they could, manufacturers ended turnkey offers. By the s, about plants were built, under construction or planned. But a number of factors conspired to end the nuclear boom. Interested in your local nuclear reactor? Use our database to research nuclear safety issues in your area. First, cost overruns revealed the true cost of nuclear plants. Once utilities began building the plants as their own projects, their lack of experience with the technology, the use of unique designs for every plant, and a "build in anticipation of design" approach led to enormous cost overruns. Because construction took years to complete, utilities found themselves with huge amounts of money invested in a plant before any problems developed. Yet the utility canceled construction of the plant in

5: Nuclear Energy Pros and Cons - Energy Informative

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The event was a decisive step toward the creation of the age of atomic energy, and critically, at the time, to the production of the atomic bomb for use in World War II. Exactly twenty-five years later, on December 2nd, , the sculpture Nuclear Energy was unveiled as a memorial to the accomplishments of Fermi and his fellow physicists. The twelve-foot tall bronze sculpture was commissioned by the University of Chicago and created by British artist Henry Moore, one of the most preeminent public sculptors of his generation. In a commentary on the work, he said: Like anything that is powerful, it has a power for good and evil Beadle set up a committee to oversee the upcoming 25th anniversary of this momentous event. Until that point there had been only a small plaque hanging on a fence to mark the site, so the search committee was instructed to look for an artist who could create a full-scale monument. Professor of History William McNeill, a key figure on the committee, approached several sculptors including Henry Moore to see if they would be interested in the task. Moore created Nuclear Energy in the same way he did many of his other public sculptures at the time. Working almost exclusively in plaster, he initially created a small maquette that would then be scaled up and cast in bronze. As Nuclear Energy was a particularly complex piece, Moore took the work to be cast in Berlin by the master founder Hermann Noack. The difficult process took around ten months to complete, with the work first cast in separate pieces that then had to be welded together. Like an enormous 3-D jigsaw puzzle, the fit of the pieces had to be perfect to create a seamless appearance in the overall shape. After construction, the sculpture was then patinated, a process that involves the application of chemicals to the surface of the bronze to produce a particular color and finish. The final color of the work was important to Moore, though he realized corrosion on the surface could be an issue due to the natural chemical reaction that turns bronze green in color. Even before Nuclear Energy had been cast in bronze, an image of the working maquette was circulated at the University. In June , the University committee overseeing the budget for the memorial viewed a photograph of the proposed sculpture for the first time, and the piece met with a certain amount of resistance. The media were quick to pick up on these tensionsâ€”headlines from the time stirred the potential controversy: In such articles, Nuclear Energy was seen as potentially threatening and frightening. In this, the upper part is very much connected with the mushroom cloud of an atomic explosion, but also, it has the shape and eye sockets of a skull. One might think of the lower part of it being a protective form and constructed for human beings and the top being more like the destructive side of the atom. So between the two it might express to people in a symbolic way the whole event. These smaller scale helmet bronzes, representing the military equipment that protects the human head, can provide further context to the meaning of Nuclear Energy. There is a striking similarity between the upper section of Nuclear Energy and these earlier works, indicating a development of ideas from the helmet forms into the larger architectural sculpture. No single photograph does justice to this monumental sculpture; every change of viewpoint reveals new order and complexity Certainly the great bronze will mark a point in time and space this is [sic] without doubt, a watershed in the history of mankind. Thanks to the support of University faculty members like Haydon and the B. Ferguson Fund at The Art Institute of Chicago, Nuclear Energy was revealed to the public in December and has had a lasting impact as a powerful testimony to one of the most important scientific developments in the history of the University of Chicago and of the world.

6: Unsupported Browser - Duke Energy

continue to use nuclear power in the energy mix, the attitudes of this middle ground will be critical. â€¢ There is a clear correlation between knowledge and support.

Stewart Brand at debate, "Does the world need nuclear energy? Wikimedia Commons With impending concerns about climate change and American energy independence, nuclear energy remains as a viable and scalable energy source. It is the only source of energy that does not produce greenhouse gases and has operated for nearly two decades with accident-free operations. Public trust in nuclear energy infrastructure is critical to its development as a sustainable and long-term solution in the United States. In order to implement policies and large-scale infrastructures conducive to the development of nuclear technologies, the American people must hold values that are aligned with those of our engineers and policy-makers. Some sources touted the importance of nuclear in the role of U. Nuclear energy presents us with a fundamental choice about what kind of society we wish to be. Do we wish to continue a way of life that is wasteful of energy, relies on highly centralized technologies, and is insensitive to ecological consequences? Or do we want to become a society more in harmony with its natural environment? We need to pursue alternative, soft paths. We should change our way of life to conserve energy as much as possible and to develop sources of energy that are ecologically safe and renewable, and that lend themselves to decentralized production - for example, sun, wind, and water. In many cases, this may not even a direct attack on the technologies, but an uncertainty that prevents any sense of progress. Modern Demographic Opinions In predicting individual attitudes towards the nuclear technologies, a study from Michigan State University found that "trust in environmental institutions and perceived risks from global environmental problems do not predict attitudes toward nuclear power. These decisions are based more on social cues than individual calculation. In any case, Americans face a unique state in which public ambivalence hinders the large-scale development of nuclear energy technologies as a means to a sustainable energy future. To fight this ambivalence, Americans must bring the issue to the public stage, as seen in the debate in Fig. The author grants permission to copy, distribute and display this work in unaltered form, with attribution to the author, for noncommercial purposes only. All other rights, including commercial rights, are reserved to the author. A Constructionist Approach," Am. Dake, "Theories of Risk Perception: Who Fears What and Why?

PUBLIC REACTIONS TO NUCLEAR POWER pdf

7: Nuclear Power | Union of Concerned Scientists

The international reaction to the Fukushima Daiichi nuclear disaster has been diverse and widespread. Many inter-governmental agencies responded to the Japanese Fukushima Daiichi nuclear disaster, often on an ad hoc basis.

History Origins The Nuclear binding energy of all natural elements in the periodic table. Higher values translate into more tightly bound nuclei and greater nuclear stability. Iron Fe is the end product of nucleosynthesis within the core of hydrogen fusing stars. The elements surrounding iron are the fission products of the fissionable actinides e. Except for iron, all other elemental nuclei have in theory the potential to be nuclear fuel, and the greater distance from iron the greater nuclear potential energy that could be released. However, he and other nuclear physics pioneers Niels Bohr and Albert Einstein believed harnessing the power of the atom for practical purposes anytime in the near future was unlikely, with Rutherford labeling such expectations "moonshine. Experiments bombarding uranium with neutrons led Fermi to believe he had created a new, transuranic element, which was dubbed hesperium. They determined that the relatively tiny neutron split the nucleus of the massive uranium atoms into two roughly equal pieces, contradicting Fermi. This work became part of the Manhattan Project , a massive secret U. The United States would test an atom bomb in July with the Trinity test , and eventually two such weapons were used in the atomic bombings of Hiroshima and Nagasaki. In August , the first widely distributed account of nuclear energy, in the form of the pocketbook The Atomic Age, discussed the peaceful future uses of nuclear energy and depicted a future where fossil fuels would go unused. Nobel laureate Glenn Seaborg , who later chaired the Atomic Energy Commission , is quoted as saying "there will be nuclear powered earth-to-moon shuttles , nuclear powered artificial hearts , plutonium heated swimming pools for SCUBA divers, and much more". This was followed by the Amendments to the Atomic Energy Act which allowed rapid declassification of U. The controllability of nuclear power reactors depends on the fact that a small fraction of neutrons resulting from fission are delayed , which makes the reactions easier to control. These are neutrons emitted by the decay of certain fission products. AEC, forerunner of the U. Nuclear Regulatory Commission and the United States Department of Energy spoke of electricity in the future being " too cheap to meter ". AEC itself had issued far more realistic testimony regarding nuclear fission to the U. Congress only months before, projecting that "costs can be brought down First connected to the national power grid on 27 August and officially opened by Queen Elizabeth II on 17 October The Shippingport Atomic Power Station in Shippingport, Pennsylvania was the first commercial reactor in the United States and was opened in One of the first organizations to develop nuclear power was the U. Navy , for the purpose of propelling submarines and aircraft carriers. Navy submarine fleet is made up entirely of nuclear-powered vessels, with 75 submarines in service. As of the Russian Navy was estimated to have 61 nuclear submarines in service; eight Soviet and Russian nuclear submarines have been lost at sea. Several serious nuclear and radiation accidents have involved nuclear submarine mishaps. Army also had a nuclear power program , beginning in The SL-1 was a U. It underwent a steam explosion and meltdown in January , which killed its three operators. The Soviet government kept this accident secret for about 30 years. The event was eventually rated at 6 on the seven-level INES scale third in severity only to the disasters at Chernobyl and Fukushima. Installed nuclear capacity initially rose relatively quickly, rising from less than 1 gigawatt GW in to GW in the late s, and GW in the late s. Since the late s worldwide capacity has risen much more slowly, reaching GW in Between around and , more than 50 GW of capacity was under construction peaking at over GW in the late s and early s â€” in , around 25 GW of new capacity was planned. More than two-thirds of all nuclear plants ordered after January were eventually cancelled. In the s U. The project was cancelled in and anti-nuclear success at Wyhl inspired opposition to nuclear power in other parts of Europe and North America. Several site occupations were also attempted. In the aftermath of the Three Mile Island accident in , some , people attended a demonstration against nuclear power in Bonn. Health and safety concerns, the accident at Three Mile Island , and the Chernobyl disaster played a part in stopping new plant construction in many countries, [42] although the public policy organization, the Brookings Institution states that new nuclear units, at the time of publishing in , had not been

built in the United States because of soft demand for electricity, and cost overruns on nuclear plants due to regulatory issues and construction delays. Eventually, more than reactor orders in the United States were ultimately cancelled [52] and the construction of new reactors ground to a halt. A cover story in the February 11, , issue of Forbes magazine commented on the overall failure of the U. However, changes were made in both the reactors themselves use of a safer enrichment of uranium and in the control system prevention of disabling safety systems , amongst other things, to reduce the possibility of a duplicate accident. Opposition in Ireland and Poland prevented nuclear programs there, while Austria , Sweden and Italy influenced by Chernobyl voted in referendums to oppose or phase out nuclear power. In July , the Italian Parliament passed a law that cancelled the results of an earlier referendum and allowed the immediate start of the Italian nuclear program. It is the first EPR design, but problems with workmanship and supervision have created costly delays which led to an inquiry by the Finnish nuclear regulator STUK.

PUBLIC REACTIONS TO NUCLEAR POWER pdf

8: Nuclear Energy | UChicago Arts | The University of Chicago

The basic principle behind a nuclear reactor is simple: the heat produced by a controlled nuclear reaction is used to create steam pressure that drives a power-generating turbine. But the technology required to implement this principle efficiently and safely is enormously complex.

Nuclear reactors in the United States may have large concrete domes covering the reactors, which are required to contain accidental releases of radiation. Not all nuclear power plants have cooling towers. Some nuclear power plants use water from lakes, rivers, or the ocean for cooling. Stock photography copyrighted Nuclear power comes from nuclear fission Nuclear power plants heat water to produce steam. The steam is used to spin large turbines that generate electricity. Nuclear power plants use heat produced during nuclear fission to heat water. In nuclear fission, atoms are split apart to form smaller atoms, releasing energy. Fission takes place inside the reactor of a nuclear power plant. At the center of the reactor is the core, which contains uranium fuel. The uranium fuel is formed into ceramic pellets. Each ceramic pellet produces about the same amount of energy as gallons of oil. These energy-rich pellets are stacked end-to-end in foot metal fuel rods. A bundle of fuel rods, some with hundreds of rods, is called a fuel assembly. A reactor core contains many fuel assemblies. The heat produced during nuclear fission in the reactor core is used to boil water into steam, which turns the blades of a steam turbine. As the turbine blades turn, they drive generators that make electricity. Nuclear plants cool the steam back into water in a separate structure at the power plant called a cooling tower or they use water from ponds, rivers, or the ocean. The cooled water is then reused to produce steam. Thirty-six of the plants have 2 or more reactors. Nuclear power has supplied about one-fifth of total annual U. The United States generates more nuclear power than any other country Of the 31 countries in the world with commercial nuclear power plants in , the United States had the most nuclear electricity generation capacity and generated more electricity from nuclear energy than any other country.

9: Public Perception of Nuclear Energy

Nuclear reactors are machines that contain and control nuclear chain reactions while releasing heat at a controlled rate. A nuclear power plant uses the heat that a nuclear reactor produces to turn water into steam, which then drives turbine generators that generate electricity.

PUBLIC REACTIONS TO NUCLEAR POWER pdf

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