



Illinois Doesn't Need New Reactors at Clinton

Exelon is in the process of applying for an Early Site Permit to site up to two new nuclear reactors in Central Illinois on the shores of Lake Clinton. Despite a long process of public intervention, serious issues remain. New reactors will have negative impacts on the local community and the region, and are not necessary to meet Illinois's electricity needs.

UNRESOLVED WASTE AND SECURITY ISSUES

Waste not adequately evaluated in ESP process

NRC fails to thoroughly examine the environmental and security impacts of the onsite storage and eventual permanent "disposal" of the additional radioactive waste from new reactors. The NRC's generic "Waste Confidence Decision" – which claims that one or more geologic repositories will be soon available and that the waste will be managed in a safe manner until then – does not rest on a strong scientific basis and has not been supported by recent developments. This "Waste Confidence Decision" should not be allowed in new reactor licensing proceedings. Instead, the impacts of near, intermediate, and long term radioactive waste storage should be evaluated in the Final Environmental Impact Statement (FEIS) for the Clinton ESP.

More waste will pile up at Clinton

Building new reactors at Clinton will mean additional waste will be generated and stored onsite around the facility. Each reactor generates over 20 metric tons of highly radioactive waste per year – material that is extremely dangerous to human health.¹ Concerns about storing waste onsite include problems with leaking casks and fuel pools, and intentional attacks on these structures. Over 54,000 metric tons of irradiated fuel has already accumulated at commercial nuclear reactors across the United States, and is expected to remain at these sites for the foreseeable future.

No solution for nuclear waste

No country in the world, including the United States, has a solution for permanently and safely managing its nuclear waste. Yucca Mountain - the only national repository site for nuclear waste under consideration in the U.S. - is beset with numerous unresolved scientific problems concerning its geologic and hydrologic suitability, and may never open. Recently, a scandal erupted over the possible falsification of scientific studies used to justify the geologic suitability of the site.¹¹ The Department of Energy (DOE) has also not yet submitted its license application for Yucca Mountain to the NRC and is not likely to meet its revised goal of accepting waste by 2017. No sites have been proposed as an alternative. Reprocessing - the chemical process of extracting plutonium from irradiated fuel after it is removed from a reactor – is also not a solution to the waste problem. Reprocessing is extremely expensive, poses a security threat, contaminates the environment, and does not eliminate the need for a repository.

Radioactive waste leaks

In 2006, tritium - a radioactive isotope of hydrogen – was discovered leaking from nuclear power plants into the groundwater at the Braidwood, Byron, and Dresden reactors throughout Illinois, the Palo Verde reactors in Arizona, and the Indian Point nuclear plant near New York City. In some cases, the nuclear industry knew about these leaks years in advance, but did not tell the Nuclear Regulatory Commission or the local communities near the plants. In France - the world leader in nuclear power - waste storage sites in the Normandy and Champagne regions have been found to be leaking radioactive material, threatening wine and dairy production.

New reactors mean additional safety risks

New reactors at Clinton would also bring increased safety risks to the region, including the possibility of accidents and attacks. Considering the devastation that could result from a successful terrorist attack on a nuclear plant, ensuring their protection should be a priority in a post-September 11th environment. However, the U.S. Nuclear Regulatory Commission (NRC) and nuclear industry have not taken significant steps to secure reactors, irradiated fuel pools, or dry waste storage casks against attack. Reactors still have inadequate defenses and a record of failing security tests.ⁱⁱⁱ Investigations have also found a serious mismanagement at several reactor facilities, such as the Davis Besse reactor in Ohio and Hope Creek station in New Jersey, where the emphasis was put on the corporate bottom line and not safety, and the NRC was found to be complicit.^{iv}

Recent court decision ruled NRC must evaluate the environmental impacts of a terrorist attack

NRC has refused to evaluate the environmental impacts of a terrorist attack on new reactors at Clinton, calling the threat “highly speculative”. In June 2006, the United States Court of Appeals for the Ninth Circuit ruled that the NRC acted unreasonably in declining to assess the environmental impact of a terrorist attack in its environmental review of a proposed radioactive waste storage facility in California.^v This may set precedent for other licensing proceedings. In October, Public Citizen, Sierra Club and NIRS filed a challenge to NRC’s refusal to consider these impacts at the Grand Gulf ESP site. The environmental review for the Clinton site should also include such an analysis.

Electricity will not necessarily be for Illinois

Although they bear the risks, communities may not even benefit from the electricity generated from new reactors at Clinton. A new nuclear unit at the Exelon ESP site would be constructed and operated as a “merchant plant” or “merchant generator”, meaning the power produced would be sold on the open wholesale market, without specific consideration to supplying a traditional service area. This means that the power generated would not necessarily be used for local needs or even for the state of Illinois.

STRESS ON LOCAL AND REGIONAL WATER RESOURCES

New reactors would harm Lake Clinton

Additional reactors would have a significant negative impact on Lake Clinton. According to the FEIS, the reactors will use a wet cooling tower or a hybrid wet/dry tower cooling system design. NRC has allowed Exelon to defer selecting a cooling system for the reactors until the Construction and Operating License (COL) process, although it is unclear how one can approve a site for new reactors under the ESP process without considering these issues now. Both cooling systems would significantly reduce fish impingement and the dumping of hot water directly back into Lake Clinton (the first reactor raised the average temperature of the lake 14 °F), but they will increase the evaporation of water from the lake. The wet cooling tower system would especially increase this evaporation. Increased evaporation from new reactors would lower lake levels, increase shoreline exposure, and disrupt fisheries and lake recreation. *NRC should require Exelon to protect local water resources and use a dry-cooling tower system - which would avoid increased water evaporation - for any new reactors it proposes to build on Lake Clinton.*

NEW LICENSING PROCESS BIASES AGENCY REVIEW

While some changes were needed in licensing reactors, there are serious problems with the “improved” NRC process. These problems include:

- *Reactor approval is broken up into many parts* - Early Site Permits (ESP), Combined Operating and Construction Licenses (COL), and Standard Reactor Design Certifications - which are difficult for the public to follow. Issues addressed in one process can not be examined in the others.
- *The approval process is spread out over too much time* (several years to potentially 40 years) which also makes it difficult for the public to remain engaged in it. The U.S. Environmental Protection Agency (EPA) has expressed concern about these changes to the licensing process saying, “The 20-year horizon under the proposed ESP does not take into consideration unforeseen population growth and/or additional stressors on air or water resources. Typically, an action which has not occurred within five years of an EIS requires a re-evaluation to determine whether significant changes have occurred, and whether a supplemental EIS is required.”^{vi}
- *Too much is left uncertain until the last minute* – i.e. choosing the reactor design and number of reactors

- *Too many things generically approved* or taken off table – i.e. waste confidence decision, risk terrorist attacks
- *Significant improvements to the safety of nuclear reactors resulting from public interventions* in past NRC process are ignored. This new licensing process cuts out the public and does a disservice to the industry and to communities.

RENEWABLE ENERGY HAS NOT BEEN FAIRLY EVALUATED AS AN ALTERNATIVE

NRC's review of alternatives is insufficient and misleading

Renewable energy technologies are dismissed by NRC as unviable replacements for a new nuclear facility at the ESP site, and the bulk of NRC's analysis focuses only on Exelon's recommended "reasonable" alternatives - conventional coal and natural gas plants. This dismissal, however, is based on minimal analysis and violates the requirement of the National Environmental Policy Act (NEPA) to "rigorously explore and objectively evaluate" at alternatives. While we agree that an analysis of alternatives should be based on "those power generation technologies that are technically reasonable and commercially viable", NRC's review has not met this standard.

NRC unjustly dismisses efficiency measures

In the Final Environmental Impact Statement (FEIS), NRC refuses to consider efficiency measures (such as geothermal heat pumps, fluorescent/LED lighting, and energy-star appliances) as an alternative to new nuclear generation, stating "As described in its ER [Environmental Report], from Exelon's perspective, alternatives not requiring additional generation are not reasonable alternatives to a merchant plant." This exclusion of efficiency alternatives is inconsistent with the NEPA requirement that the permit applicants' self-interested purpose cannot constrain the alternatives analysis.

NRC underestimates Illinois's wind resources

While NRC has corrected some incorrect information about the impacts of wind in the final EIS as a result of our intervention, NRC uses outdated information and has a limited understanding of what can generate baseload power.^{vii} NRC, for instance, states that "Wind power, by itself, is not suitable for large baseload capacity." NRC, however, offers minimal technical analysis to support this conclusion. Recently, the International Energy Agency (IEA) - an intergovernmental body of twenty-six countries committed to advancing security of energy supply, economic growth, and environmental sustainability- concluded that *intermittency is not a technical barrier to renewable energy*. IEA recommends distributed generation, links across geographic areas, a diverse mix of technologies harnessing different resources, and the continued development of storage technologies.^{viii} Such storage technologies already available in Illinois would be pumped hydroelectric storage and compressed air storage. Others are being developed. The amount of electricity from "intermittent" and decentralized sources can reach at least 20% before storage is necessary.

NRC misrepresents Illinois's solar resources

NRC also mistakenly asserts that the "construction of solar generating facilities has substantial impacts on natural resources", and would have large land requirements. The agency fails to understand the solar PV would be installed and integrated into the existing buildings and infrastructure over the area the proposed Clinton reactor would supply electricity, making impacts on natural resources and land minimal. Like with wind, NRC dismisses solar PV as incapable of supplying baseload power, and also incorrectly implies the solar resource is too weak to be significant. As we have seen with the successful use of solar power in New York and throughout New England, this is simply not the case. NRC also states that photovoltaic technologies (PV) "cannot currently compete with conventional nuclear and fossil fuel technologies because of solar power's higher capital cost per kilowatt of capacity". Recently, however, major breakthroughs have been announced in the cost of solar PV cells, with companies in California and South Africa beginning production of high efficiency thin film solar cells at a fourth or fifth the cost of present panels.^{ix} This would make these panels cost competitive with new nuclear reactors, and these developments should be incorporated into the NRC analysis.

What are Illinois's alternatives?

It is technically and economically feasible for a diverse mix of existing renewable energy technologies to meet Illinois's electricity needs over the coming decades.^x These renewable resources can be harnessed effectively and reliably without producing carbon emissions or the burdens of nuclear power. According to recent studies from

Stanford University, the National Renewable Energy Laboratory, and the Energy Foundation, Illinois's electricity needs can be fully met in the coming decades by solar, wind, advanced hydroelectric power, and geothermal heat pumps. According to the data from these studies:

- Illinois's PV solar potential by 2025 is 36, 261 megawatts (MW), which would generate over 66 million megawatt hours (MWh) annually – about 48% of Illinois's electricity use.^{xi} This is a low estimate, as it uses a modest value for Illinois's hours of sunshine, only includes available residential and commercial roof space, and does not take into account the available space for PV from parking lots, awnings, windows, highway medians, and industrial buildings. With these other spaces taken into account, Illinois could produce significantly more electricity from solar.
- Illinois also has useful wind resources, which are rated fair to good by the Department of Energy (DOE). A complete mapping of Illinois's wind resources has not been made public, but there are significant areas of class 3 and 4 winds capable of commercial generation. A Stanford study on U.S. wind resources in 2003 also found that there are also high class 6 sites located on Lake Michigan.^{xii} Using the conservative DOE estimate of Illinois's wind resources at 9000 MW, this would generate 26.3 million MWh annually – 19% of Illinois annual electricity use. Illinois is also surrounded regionally by other windy states, especially Iowa, southern Minnesota, and South Dakota. Wind energy from these states could also help meet Illinois's needs.
- Geothermal heat pumps are systems that use the relatively constant temperature of the earth to heat and cool buildings, significantly reducing the energy typically used for these purposes. These pumps could be used in Illinois to reduce a building's energy use by 30 to 60% - which would significantly reduce the amount of natural gas used for heating and the electricity used for air-conditioning.

Renewable alternatives can provide local jobs and prosperity

Significant investments in these renewable technologies can bring just as much local economic benefit to Dewitt County and the central Illinois region as building new reactors at Clinton. The jobs however will be safer and would also be more supportive of other local businesses, with more of the profits remaining in the community.

For the documents referenced in this fact sheet, please see

http://www.citizen.org/cmep/energy_enviro_nuclear/newnukes/clinton/articles.cfm?ID=15881

WHAT SHOULD YOU ASK OF THE NUCLEAR REGULATORY COMMISSION?

NRC should not grant Exelon an Early Site Permit for new reactors at Clinton. Issues like waste and security must be thoroughly evaluated in the ESP process, and NRC should reexamine the potential of renewable energy resources in Illinois.

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