May 3, 2004

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	
	Docket No. 52-007
Exelon Generation Company, LLC	
(Early Site Permit for Clinton ESP Site)	

CONTENTIONS OF BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE, NUCLEAR INFORMATION AND RESOURCE SERVICE, AND PUBLIC CITIZEN REGARDING EARLY SITE PERMIT APPLICATION FOR SITE OF CLINTON NUCLEAR POWER PLANT

I. INTRODUCTION

Pursuant to 10 C.F.R. § 2.309 and the Atomic Safety and Licensing Board's ("ASLB's") Initial Prehearing Order of March 8, 2004, Blue Ridge Environmental Defense League ("BREDL"), Nuclear Information and Resource Service ("NIRS"), Nuclear Energy Information Service ("NEIS"), and Public Citizen (hereinafter "BREDL et al."), hereby submit contentions in this proceeding regarding Exelon Generating Company's ("Exelon's") application for an Early Site Permit ("ESP") for the site of the Clinton Unit 2 nuclear power plant. These contentions are separate from the contentions that BREDL et al. filed today in conjunction with the Environmental Law and Policy Center.

As demonstrated below, these contentions satisfy the NRC's admissibility requirements in 10 C.F.R. § 2.309.

II. CONTENTIONS

Below Petitioners present their additional contentions, which are numbered in accordance with the ASLB's instructions in its March 8, 2004, Initial Prehearing Order. Contentions related to the Site Safety Analysis begin with 2. Contentions relating to environmental issues begin with 3. Petitioners' environmental contentions are numbered consecutively after the numbers used in Environmental Law and Policy Center's contentions. Petitioners are submitting no contentions under the "administrative" or "miscellaneous" categories proposed by the ASLB in its order.

2. Contentions Regarding Site Safety Analysis

Contention 2.1: Failure to provide adequate safety assessment of reactor interaction

Contention: The ESP application for the Clinton site fails to comply with 10 C.F.R. § 52.17 because its safety assessment does not contain an adequate analysis and evaluation of the major structures, systems, and components of the facility that bear significantly on the acceptability of the site under the radiological consequences evaluation factors identified in 10 C.F.R. § 50.23(a)(1). In particular, the safety assessment does not adequately take into account the potential effects on radiological accident consequences of co-locating new reactors with advanced designs next to an older reactor. The safety assessment should contain a comprehensive evaluation and analysis of the ways in which interaction of the old and new plants under accident conditions may exacerbate the consequences of a radiological accident. Without such an evaluation and analysis, the presiding officer cannot make a finding that, taking into consideration the site criteria in Part 100 of the regulations, the proposed reactors can be operated "without undue risk to the health and safety of the public." 10 C.F.R. § 52.21.

This contention is supported by the Declaration of David A. Lochbaum, Nuclear Safety Engineer, In Support of Petitioners' Contentions (May 3, 2004), copy attached as Exhibit 2.1-1.

Basis: Pursuant to 10 C.F.R. § 52.17, an ESP application must contain:

> a description and safety assessment of the site on which the facility is to be located. The assessment must contain an analysis and evaluation of the major structures, systems, and components of the facility that bear significantly on the acceptability of the site under the radiological consequence evaluation factors identified in § 50.34(a)(1) of this chapter.

Pursuant to 10 C.F.R. § 50.34(a)(1)(ii), an ESP application must consider such "radiological consequence evaluation factors" as whether and to what extent "generally accepted engineering standards" are used to design the new plant, whether and to what extent the new reactor design incorporates "unique, unusual, or enhanced safety features having a significant bearing on the probability or consequences" of an accident release of radiation, and plant design features that are "intended to mitigate the radiological consequences of accidents."[1]

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[1] Section 50.34(a)(1) has two subsections, (i) and (ii). Subsection (ii) presumably is the relevant provision, because it applies to post-1997 applications for construction permits, design certification, or combined licenses. The relevant portion of Subsection (ii) requires submission of the following information:

> (i) A description and safety assessment of the site and a safety assessment of the facility. It is expected that reactors will reflect through their design, construction and operation an extremely low probability for accidents that could result in the release of significant quantities of radioactive fission products. The following power reactor design characteristics and proposed operation will be taken into consideration by the Commission:
>
> (A) Intended use of the reactor including the proposed maximum power level and the nature and inventory of contained radioactive materials;
>
> (B) The extent to which generally accepted engineering standards and applied to the design of the reactor;

The safety assessment for the Clinton ESP application is deficient because it does not adequately consider the relationship between the design of the proposed new reactors and the design of the existing reactor on the site. The new reactor designs already certified by NRC and those currently under review by NRC are allegedly "safer" and less likely to have an accident involving significant core damage. For instance, the potential reactor designs listed in the application include the AP-1000 pressurized water reactor, the gas-turbine modular helium reactor ("GT-MHR"), and the pebble-bed modular reactor (PBMR). ESP Application, § 1.3. The vendors of these reactors contend that the designs contain features which lessen the likelihood of an accident, and which also lessen the severity of an accident, should one occur. Consequently, the design basis accidents ("DBAs") and source terms resulting from DBAs for the proposed reactors are significantly less severe than for the existing operating reactor. Consequently, the new reactors are designed with fewer features to protect station workers from radiation released during accident conditions, including loss-of-coolant accidents. An accident at

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> (C) The extent to which the reactor incorporates unique, unusual or enhanced safety features having a significant bearing on the probability or consequences of accidental release of radioactive materials;
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> (D) The safety features that are to be engineered into the facility and those barriers that must be breached as a result of an accident before a release of radioactive material to the environment can occur. Special attention must be directed to plant design features intended to mitigate the radiological consequences of accidents. In performing this assessment, an applicant shall assume a fission product release [footnote omitted] from the core into the containment, assuming that the facility is operated at the ultimate power level contemplated. The applicant shall perform an evaluation and analysis of the postulated fission product release, using the expected demonstrable containment leak rate and any fission product cleanup systems intended to mitigate the consequences of the accidents, together with applicable site characteristics, including site meteorology, to evaluate the offsite radiological consequences. Site characteristics must comply with part 100 of this chapter. . . .

the existing reactor could, therefore, have significant adverse effects on the operation of the new reactor.

There are many sites in the United States with more than one operating nuclear power reactor. Many of these multiple-unit sites feature reactors of essentially duplicate design. Some of these multiple-unit sites have reactors of different design, such as the reactors at the Arkansas Nuclear One site supplied by two distinctly different manufacturers. But the reactors at these multiple-unit sites shared the common trait of having the potential for a postulated accident causing significant amounts of radiation to be released. Placing a new reactor design at a site with one or more operating reactors of an earlier vintage creates a more difficult situation.

The interaction of control room designs for older and newer reactors provides an example of this problem. The control room design for the new reactors may be sufficient to adequately protect workers from postulated accidents at that reactor and from postulated accidents at nearby reactors of the same or similar design. But the control room design for the new reactors may not adequately protect workers from postulated accidents at nearby reactors of different design (e.g., the current fleet of operating reactors).

As required by General Design Criterion 19 of Appendix A to Part 50, a control room:

> shall be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents. Adequate radiation protection shall be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 5 rem whole body, or its equivalent to any part of the body, for the duration of the accident. Equipment at appropriate locations outside the control room shall be provided (1) with a design capability for prompt hot shutdown of

> the reactor, including necessary instrumentation and controls to maintain the unit in a safe condition during hot shutdown, and (2) with a potential capability for subsequent cold shutdown of the reactor through the use of suitable procedures.

The reactors operating today, such as Clinton Unit 1, are designed with ventilation systems that maintain the control rooms at higher pressure than outside so that in event of an accident, clean air leaks out of the control room rather than radioactive air leaking in. Some outside air must be drawn in to create the positive pressure inside the control rooms- this outside air passes through charcoal and HEPA filters to remove radioactivity before it reached the operators in the control rooms. Because these existing reactors cannot preclude the occurrence of an accident resulting in significant release of radiation, GDC-19 requires their control rooms be designed to protect workers from exposure to that radiation.

Because new reactor designs are allegedly safer, the protection for control room operators is less. Assuming the new reactor designs are safer, building one next to an existing reactor means that it will be exposed to radiation released during an accident at Clinton Unit 1. Thus, it is unreasonable to protect the operators in the control room of the proposed new reactor at the Clinton site, but not the operators in the control room of the existing reactor. The applicant has not shown that the workers in the control room of a new plant or plants would be adequately protected from a design basis accident or a severe accident, as required by GDC 19.

Environmental qualification of electrical equipment provides another example of the potentially adverse interaction between old and new plant designs. Pursuant to 10 C.F.R. § 50.49 and General Design Criterion 4 of Appendix A to Part 50, nuclear power plant electrical equipment must be qualified to withstand the severity of accident

conditions that are predicted for that plant design. Because accidents at nuclear plants of relatively new design are not expected to be as severe as accidents than for older plants, electrical equipment in the new plants at the Clinton site may not be qualified to withstand levels of heat or radiation that may be generated by an accident at the existing plant. This should be of concern to the applicant because of the relatively close proximity of the new and existing plants.[2]

Contention 2.2: Failure to Evaluate Site Suitability for Below-Grade Placement of Reactor Containment

Contention: The Site Safety Analysis Report for the Clinton ESP application is inadequate because it does not evaluate the suitability of the site to locate the reactor containment below grade-level. Below-grade construction is advisable and appropriate, if not necessary, in order to maintain an adequate level of security in the post-9/11 threat environment.

Basis:

a. Legal requirements. Pursuant to 10 C.F.R. § 52.17, an ESP application must contain "a description and safety assessment of the site on which the facility is to be located." Section 52.17 also requires that site characteristics "must comply with part 100 of this chapter." Part 100 requirements include the stipulation that: "[s]ite characteristics must be such that adequate security plans and measures can be developed." 10 C.F.R. § 100.21(f). The site conditions that must be evaluated include "soil and rock stability,

[2] Section 1.2.3 of the ESP application for Clinton reports that the proposed new reactor(s) will be located approximately 700 feet from the existing Clinton facility. A radiological release could therefore impact the new reactor(s).

liquefaction potential, natural and artificial slope stability, cooling water supply, and remote safety-related structure siting."

b. Rationale for requiring below-grade construction of containments. The applicant should be required to evaluate the Clinton site for below-grade construction of the containment because, as currently designed and constructed, nuclear power plants are unacceptably attractive and vulnerable targets for terrorist attacks and sabotage. The attractiveness of nuclear plants as terrorist targets is well-recognized. In his 2002 State of the Union Address, for example, President Bush stated that nuclear power plants are priority targets for terrorists. http://www.cnn.com/2002/ALLPOLITICS/01/29/bush.speech.txt/. The fact that nuclear plants are still high on Al Qaeda's target list was recently confirmed by Robert Hutchings, chairman of the National Intelligence Council (which reports to the CIA Director). Reuters, "U.S. Intelligence Official: Qaeda Posed Plane Threat," New York Times (February 17, 2004), copy attached as Exhibit 2.2-1.

The vulnerability of containment structures and associated irradiated fuel storage ponds to terrorist attack, particularly to aircraft penetration, has also been recognized in NRC documents and press articles. For example, a 1987 NRC-sponsored study found that a 12,500 pound aircraft had a 32% chance of crashing through a 6-feet thick reinforced concrete wall, and an 84% chance of penetrating through a 2-feet thick reinforced concrete wall. NUREG-/CR-5042, Evaluation of External Hazards to Nuclear

Power Plants in the United States (December 1987), relevant excerpts attached as Exhibit 2.2-2.[3]

A 1982 study by Argonne National Laboratory also concluded that U.S. reactor containments have not been adequately evaluated for effects of explosion and fire from impact associated with penetration by an aircraft. While the study is not available from the NRC's Public Document Room, it was described by the Washington Post in an October 25, 2001 article. Peter Behr, "Nuclear Plants Vulnerability Raised Attack Concerns: 1982 Report on Danger of Jet Crashes Into Reactors Was Open To Public," Washington Post at A4 (October 25, 2001), copy attached as Exhibit 2.2-3. According to the article, Argonne National Laboratory calculated the impact of various commercial aircraft at varying speeds. The study determined that the containment dome would be penetrated at the highest flight speeds. The study also determined that the ignition of a small percentage of the aviation fuel inside the containment dome would have the force of 1,000 pounds of explosives and "could lead to rather violent explosion environment and impose upon the primary containment relatively severe loads." *Id.* As quoted by the Washington Post article, the Argonne study raised the concern that:

> Based on the review of past [NRC] licensing experience, it appears that fire and explosion hazards have been treated with much less care than the direct aircraft impact and the resulting structural response.
>
> Therefore, the claim that these fire/explosion effects do not represent a threat to nuclear power plant facilities has not been clearly demonstrated.

Id. Moreover, according to NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," § 3.5.2 (January 2001), one

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[3] Notably, a "large" aircraft was defined as weighing 12,500 pounds, even though the report observed that a Boeing B727-200 has a maximum takeoff weight of 209,500 pounds (or roughly the equivalent of 17 "large" aircraft). *Id.*, Table 6.4 at 6-27.

out of two aircraft flying today is large enough to penetrate a 5-feet thick reinforced concrete wall, such as the side of a irradiate fuel storage pond. *Id.* Relevant pages of the report are attached as Exhibit 2.2-4.

The various advanced reactor generation designs that are being considered by Exelon in its application were developed before the terrorist attacks of September 11, and before the NRC undertook a comprehensive evaluation of its regulations to evaluate their adequacy to protect against the terrorist threat. Thus, they are not specifically designed to protect against assault by attackers with the level of determination and capability demonstrated by the September 11 terrorist attackers. In fact, the new generation of advanced reactors does not have as robust a containment as the current generation. For example, as a general matter, the containment thickness of the current generation of nuclear power plants is about 2-3 feet.[4] The containments of the allegedly new "inherently safe" reactor containment building designs are equivalent or even thinner. For example, the Westinghouse AP 600 Advanced Pressurized Water Reactor has a 3-foot thick containment wall of reinforced concrete.[5]

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[4] For example, the containment dome for the existing Clinton reactor, the Grand Gulf reactor, and other Boiling Water Reactor Mark III designs are 0.25-inches of steel and 2.5-feet of reinforced concrete. NUREG/CR-1037, Containment Performance Working Group Report at 2-29 (May 1985). Similarly, the thickness of the containment dome of the Davis-Besse reactor, a Pressurized Water Reactor, is 13/16-inch of steel and 2.5-feet thick reinforced concrete. NUREG/CR-5567, PWR Dry Containment Issue Characterization at 8 (August 1990). The thickness of the containment dome at the Surry nuclear power station, also a PWR, is 2.5 feet of reinforced concrete. NUREG/CR-5662, Hydrogen Combustion, Control, and Value-Impact Analysis for PWR Containments at 145 (June 1991).

[5] Declaration of Paul V. Gunter (May 3, 2004), attached as Exhibit 2.2-5.

c. Viability of below-grade construction

Below-grade construction of nuclear reactor containments is a viable design security measure that would protect the reactor containment from assault by aircraft or other high-power weapons. In fact, consideration of below-grade construction was recommended as a prudent design feature over 50 years ago by Dr. Edward Teller, one of the founders of the U.S. nuclear industry. In a July 23, 1953, letter to the Joint Committee on Atomic Energy, Dr. Teller noted:

> [t]he various committees dealing with reactor safety have come to the conclusion that none of the powerful reactors built or suggested up to the present time are absolutely safe. Though the possibility of an accident seems small, a release of the active products in a city or densely populated area would lead to disastrous results. It has been therefore the practice of these committees to recommend the observance of exclusion distances, that is, to exclude the public from areas around reactors, the size of the area varying in appropriate manner with the amount of radioactive poison that the reactor might release. Rigid enforcement of such exclusion distances might hamper future development of reactors to an unreasonable extent. In particular, the danger that a reactor might malfunction and release its radioactive poison differs for different kinds of reactors. It is my opinion that reactors of sufficiently safe types might be developed in the near future. *Apart from the basic construction of the reactor, underground location or particularly thought-fully constructed safety devices might be considered.*

Letter from Dr. Edward Teller to the Honorable Sterling Cole, Chairman of the Joint Committee on Atomic Energy, United States Congress (emphasis added), copy attached as Exhibit 2.2-6.[6]

There is no indication in the ESP application that the applicant considered the suitability of the site for below-grade construction of the reactor containment. While the application evaluates the suitability of the site for construction of a foundation for the facility, suitability for underground construction would require a much more

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[6] Petitioners note that they were unable to obtain a copy of the original letter. The copy that is attached is was retyped and posted on the website of the Nuclear Age Peace Foundation.

sophisticated and in-depth analysis of geological and hydrogeological conditions. Therefore, Petitioners contend that the applicant has not provided sufficient information within its site safety analysis to permit a finding that the propose site is suitable for new nuclear reactors.

3. Environmental Contentions

Contention 3.3 Even if the Waste Confidence Decision Applies to This Proceeding, It Should be Reconsidered.

Contention: As discussed in a contention submitted separately by Petitioners in conjunction with the Environmental Law and Policy Center, Petitioners do not believe that the Waste Confidence decision applies to this proceeding. Even if the Waste Confidence Decision is found to apply to this proceeding, however, it should be reconsidered, in light of significant and pertinent unexpected events that raise substantial doubt about its continuing validity, *i.e.*, the increased threat of terrorist attacks against U.S. facilities.

Basis: In its 1999 "Nuclear Waste Confidence Decision" revision, NRC stated "the Commission would consider undertaking a comprehensive reevaluation of the Waste Confidence findings…if significant and pertinent unexpected events occur raising substantial doubt about the continuing validity of the Waste Confidence findings." 64 Fed. Reg. at 68,007. Clearly, the catastrophic terrorist attacks upon the United States on September 11th, 2001 constituted significant and pertinent unexpected events that raise substantial doubts about the continuing validity of the third and fourth findings of the revised Waste Confidence Decision. These findings are:

> 3. The Commission finds reasonable assurance that high-level radioactive waste and spent fuel will be managed in a safe manner until sufficient repository capacity is available to assure the safe disposal of all high-level waste and spent fuel (This finding is identical to the finding in the original Waste Confidence Decision in 1984).
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> 4. The Commission finds reasonable assurance that, if necessary, spent fuel can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor at its spent fuel storage basin, or at either onsite or offsite independent spent fuel storage installations. (This finding is basically identical to that in the original Waste Confidence Decision with the addition of the consideration of license renewal and spent fuel storage 30 years beyond the licensed life for operation of a reactor).

64 Fed. Reg. at 68,006. The terrorist threat to irradiated nuclear fuel and high-level radioactive waste – whether it is being stored on-site at commercial reactors in storage pools or dry casks; stored in away-from-reactor Independent Spent Fuel Storage Installations; or transported by truck, train, or barge between nuclear plants and off-site interim storage facilities – demands an evaluation of whether (a) it is appropriate to store spent fuel and other highly radioactive waste for 30 years or more pending availability of a permanent repository, and (b) whether nuclear power should be phased out as quickly as possible as a matter of environmental protection, national security, public safety, and common defense.

The homeland security risks posed by indefinite temporary storage of spent fuel have been recognized by Energy Secretary Spencer Abraham:

> Yucca Mountain is an important component of homeland security. More than 161 million people live within 75 miles of one or more nuclear waste sites, all of which were intended to be temporary. We believe that today these sites are safe, but *prudence demands we consolidate this waste from widely dispersed, above-ground sites into a deep underground location that can be better protected.*

Statement of Spencer Abraham, Secretary of Energy, Before the Energy and Natural Resources Committee, U.S. Senate (May 16, 2002), copy attached as Exhibit 3.1-1

(emphasis added). It is undisputed that neither fuel storage pools nor dry storage facilities are designed to withstand the type of determined and sophisticated attack that was carried out on September 11, 2001.

To protect against and mitigate the impacts of terrorist attacks, the NRC has developed a system to maintain a constant state of alert, undertaken a comprehensive review of the adequacy of its safety and security regulations, and upgraded its security requirements for all operating nuclear facilities in the United States. Clearly, under NEPA it is also appropriate to consider whether the Commission continues to have a basis for expressing confidence that stored spent fuel and other high-level radioactive waste is safe from a terrorist attack.

Petitioners are aware that the Commission has ruled that environmental impacts of terrorist attacks are not cognizable under NEPA. *See, e.g., Pacific Gas & Electric Co.* (Diablo Canyon Independent Spent Fuel Storage Installation), CLI-03-01, 57 NRC 1 (2003); *Private Fuel Storage, L.L.C.* (Independent Fuel Storage Installation), CLI-02-25, 56 NRC 340 (2002). Petitioners request that the Commission reconsider this policy, in light of (a) the obvious attractiveness and vulnerability of spent fuel to terrorist attack, (b), the Secretary of Energy's recognition of the relationship between homeland security and assured capacity for timely spent fuel disposal; and (c) the Commission's explicit statement in the Waste Confidence status review that it would undertake a comprehensive reevaluation of the Waste Confidence findings if "significant and pertinent unexpected events" occur raising substantial doubt about the continuing validity of the Waste Confidence findings. Clearly, that condition is met here.

III. CONCLUSION

For the foregoing reasons, the ASLB should admit Petitioners' contentions.

Respectfully submitted,

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[7] Counsel for BREDL has been duly authorized to submit these contentions on behalf of BREDL, NIRS, NEIS, and Public Citizen.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD PANEL

In the Matter of	
	Docket No. 52-007-ESP
Exelon Generation Company, LLC	
	ASLBP No. 04-821-01-ESP
(Early Site Permit for Clinton ESP Site)	

SUPPLEMENTAL REQUEST FOR HEARING AND PETITION TO INTERVENE BY ENVIRONMENTAL LAW AND POLICY CENTER, BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE, NUCLEAR INFORMATION AND RESOURCE SERVICE, NUCLEAR ENERGY INFORMATION SERVICE, AND PUBLIC CITIZEN

In accordance with the Nuclear Regulatory Commission's ("NRC") Rules of Practice for Domestic Licensing Proceedings in 10 C.F.R. Part 2, and the Atomic Safety and Licensing Board's Initial Prehearing Order, Petitioners Environmental Law and Policy Center, Blue Ridge Environmental Defense League, Nuclear Energy Information Service, Nuclear Information and Resource Service, and Public Citizen hereby submit contentions challenging the adequacy of Exelon Generating Company's September 25, 2003 application for an Early Site Permit ("ESP") for the Clinton 2 nuclear plant. As demonstrated below, each of the contentions satisfy the NRC's admissibility requirements that are set forth in 10 C.F.R. § 2.309(f).

I. ENVIRONMENTAL CONTENTIONS

CONTENTION 3.1: THE CLEAN ENERGY ALTERNATIVES CONTENTION - The Environmental Review Fails To Rigorously Explore And Objectively Evaluate All Reasonable Alternatives.

In Section 9.2 of the Environmental Report ("ER"), Exelon claims to satisfy 10 C.F.R. 51.45(b)(3), which requires a discussion of alternatives that is "sufficiently complete to aid the

Commission in developing and exploring" "appropriate alternatives . . . concerning alternative uses of available resources," pursuant to the National Environmental Policy Act ("NEPA"). However, Exelon's analysis is premised on several material legal and factual flaws that lead it to improperly reject better, lower-cost, safer, and environmentally preferable energy efficiency, renewable energy resource, distributed generation, and "clean coal" resource alternatives. Therefore, Exelon's ER does not provide the basis for the rigorous exploration and objective evaluation of all reasonable alternatives to the ESP that is required by NEPA.

Basis: There are several serious shortcomings in the ER's evaluation of reasonable alternatives for the Clinton ESP application. First, the evaluation of alternatives is improperly constrained because the NRC regulations provide, in clear violation of NEPA, that the application need not analyze the need for power. Second, the ER treats each alternative energy source as a discrete alternative, contrary to the mandate of NEPA to combine alternatives. Third, the ER improperly rejects the reasonable alternative of meeting energy needs through increased energy efficiency efforts on the ground that such efforts would not be profitable for Exelon. Finally, the ER relies on flawed and outdated information to support its conclusion that energy efficiency, renewable energy resources, distributed generation and "clean coal" technologies are not reasonable alternatives to new nuclear power generation. Each of these points demonstrate that there is "a germane dispute" with Exelon "on a material issue of law or fact," thereby making this an admissible contention. 10 C.F.R. 2.309(f)(1)(vi).

A. The NRC Is Required To Consider All Reasonable Alternatives, Including Energy Efficiency And Renewable Energy Resources, To The Siting Of A New Nuclear Power Plant at Clinton.

At the outset, it is important to note that, despite its public statements to the contrary, the NRC is legally required to consider energy efficiency and renewable energy resource alternatives to the siting of a new Clinton nuclear plant. At the NRC's public scoping meeting held in Clinton, Illinois on December 18, 2003, NRC Senior Project Manager Thomas J. Kenyon stated that "the Commission has determined that we do not need to look at alternative energy sources at this time."[1] A power point slide and handout from the NRC also identified "alternative energy sources" as an issue that need not be considered during the ESP process.[2]

These assertions are incorrect. Energy efficiency and renewable energy resources are reasonable alternatives that must be considered. Under NEPA, the NRC must "rigorously explore and objectively evaluate all reasonable alternatives" to the granting of an ESP. 40 C.F.R. 1502.14(a). Furthermore, NRC regulations require that the environmental analysis of the ESP "focus on the environmental effects of construction and operation of a reactor." 10 C.F.R. 52.17. As part of this analysis, the NRC must "develop and explore . . . appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." 10 C.F.R. 51.45(b)(3). Energy efficiency and renewable energy resources clearly qualify as "reasonable" and "appropriate" alternatives to the siting of a new Clinton nuclear plant and to the "environmental effects of construction and operation of a reactor" at the site. Therefore, the NRC must consider these alternatives as part of its environmental analysis under NEPA and 10 C.F.R. 51.45(b)(3).

[1] U.S. Nuclear Regulatory Commission, Public Scoping Meeting Transcript (Dec. 18, 2003), at p. 14, Lines 14-15 (Exhibit 1).

B. The ER's Analysis Is Improperly Constrained By The Lack Of Consideration Of The Need For Power.

The alternatives analysis in Exelon's ER is improperly constrained by NRC regulations that violate NEPA. In particular, 10 C.F.R. 52.17 and 52.18 provide that the NRC need not consider "the need for power" in determining whether or not to grant an ESP to Exelon. The need for power, however, is at the heart of the purpose and need statement which, in turn, serves as the baseline by which the reasonableness of various alternatives are measured. Without an analysis of whether, how much, and what type of energy is needed, there is no way to accurately weigh alternatives against one another or to conclude whether it is appropriate to site a new nuclear power plant. It is impossible, therefore, to engage in the rigorous and objective evaluation of alternatives required by NEPA without first analyzing the need for power.

In the context of this case, the NRC must determine how to apply its regulations in a manner that complies with NEPA. Or, the NRC must revisit its regulations or take other necessary administrative actions so that the ER process is conducted in a manner that fully complies with NEPA, which is the governing federal law.

While the NRC's regulations purport to foreclose an analysis of the need for power, Exelon identifies a need for power, which it then uses to reject alternatives. In particular, Exelon states that any feasible alternative must be able to generate base-load power (ER, p. 9.2-6), but provides no justification for that statement. In fact, Exelon's later admission that Illinois is a net energy exporter (ER, p. 9.2-5) suggests that additional base-load capacity is not needed here. Exelon justifies rejecting renewable energy resources, such as wind and solar power, on the ground that those resources are purportedly not suitable for large base-load capacity. (ER, pp. 9.2-7, 9.2-8). An examination of the actual need for power could lead to significantly different

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[2] See Exhibit 2, p. 5.

conclusions regarding such alternatives. For example, if Illinois actually needs additional peak-load capacity, then alternative resources such as solar power would fare much better.

C. The ER Must Consider Energy Efficiency And Renewable Energy Resources Both Individually And In Combination.

The alternatives analysis in Exelon's ER is also flawed because it fails to consider energy efficiency and various alternative energy resources in combination. Exelon concedes that Section 9.2 evaluates only discrete electrical generation sources individually and does not evaluate a robust mix of energy resources. (ER, p. 9.2-6). A rigorous and objective analysis of alternatives, however, requires a consideration of alternatives not only individually, but also in combination. *See, e.g.*, *Davis v. Mineta*, 302 F.3d 1104, 1121-22 (10th Cir. 2002) (identifying the failure to consider various alternatives to a highway project in combination as "one of the most egregious shortfalls" in the agency's environmental analysis). Just as today's energy supply comes from a mix of resources, a viable alternative to a new nuclear power plant can also involve a combination of energy efficiency and new clean energy resources. In particular, a combination of wind power, solar power, energy efficiency, distributed generation, and "clean coal" technology would be a better, lower-cost, safer, and environmentally preferable alternative to a new nuclear power plant. Exelon and the NRC are legally required to consider such combinations.

D. The ER's Rejection Of Energy Efficiency Alternatives Is Both Legally And Factually Flawed.

The ER improperly rejects energy efficiency as an unreasonable alternative to the siting of a new nuclear power plant in Illinois. Exelon attempts to justify its rejection of energy

efficiency on two grounds. First, Exelon contends that utility deregulation has removed the incentive for Exelon to invest in energy efficiency. (ER, pp. 9.2-2 to 9.2-3). Second, Exelon asserts that the decline in generating costs and the amount of energy efficiency requirements already in place have significantly reduced the cost-effectiveness of energy efficiency efforts. (ER, p. 9.2-4). Exelon's first justification for rejecting energy efficiency is legally flawed, and its second purported justification is factually flawed.

Exelon's first excuse for rejecting energy efficiency ignores the NRC's legal duty under NEPA to evaluate all reasonable alternatives. The NRC is not bound by the wishes of the project applicant, *Simmons v. U.S. Army Corps of Engineers*, 120 F.3d 664, 669 (7th Cir. 1997), but instead must consider all reasonable alternatives to meeting the goal of a proposal, whether or not the applicant wants to or is able to carry it them out. *Cf.* 42 C.F.R. 1502.14(c) (agency cannot reject an alternative simply because it is outside the agency's jurisdiction); *Muckleshoot Indian Tribe v. U.S. Forest Serv.*, 177 F.3d 800, 814 (9th Cir. 1999) (same). As explained below, energy efficiency is a better, cheaper, safer, and less environmentally risky alternative to a new nuclear power plant. Therefore, whether or not Exelon and its subsidiaries prefer to invest in energy efficiency, that reasonable alternative must be rigorously explored and objectively evaluated. 40 C.F.R. 1502.14(a). The fact that energy efficiency efforts may materialize as a result of state or federal government initiatives, other public investments, and market-based policies and rate structures does not provide a basis for rejecting the economically, technologically, and environmentally feasible alternative of energy efficiency. Therefore, the ER should have considered a thorough analysis of this alternative – energy efficiency both alone and in combination with other energy resources.

Perhaps realizing the weakness of its legal position, Exelon also asserts in the ER that deregulation and declines in generation costs make energy efficiency an ineffective alternative to a new nuclear power plant. The ER, however, provides no support for this claim that energy efficiency is not cost-effective. In reality, energy efficiency is a better, cheaper, safer, and less environmentally risky alternative.

In contrast to the unsupported conclusions provided in the ER, recent studies demonstrate that energy efficiency is a more viable and cost-effective alternative to new nuclear power generation. For example, the 2001 *Repowering the Midwest* study,[3] which is a comprehensive clean energy development analyses conducted on the Midwest's energy sector, demonstrates that energy efficiency efforts can significantly reduce the demand for power at a cost of 2.5 cents per kilowatt-hour or less – lower than the cost of generation, transmission, and distribution of electricity from central power plants. Implementing modern new cost-effective energy efficiency technologies for commercial and residential lighting, heating, ventilation and cooling, industrial motors, refrigerators, and other appliances can flatten electricity demand over the next two decades. *Repowering the Midwest* relied on the methodology of the United States Department of Energy's 1997 "Five National Labs" Study, which is an analysis by a working group with members from five national energy laboratories,[4] in concluding that:

- Energy efficiency efforts can reduce electricity demand by 16% in 2010 and 28% in 2020 versus a projected base case scenario.
- Energy efficiency efforts can save 50,761 GWh of electricity annually by 2020 in Illinois alone.

[3] Environmental Law and Policy Center, et al., *Repowering the Midwest: The Clean Energy Development Plan for the Heartland* (2001) (Exhibit 3).

[4] U.S. Department of Energy, *U.S. Carbon Reductions: Potential Impacts of Energy Technologies by 2010 and Beyond* (1997) (The Executive Summary of this document is attached as Exhibit 4).

- Energy efficiency efforts are highly cost-effective, requiring an average investment equivalent to only 2.5 cents per kilowatt-hour.
- Energy efficiency efforts can reduce net electricity costs in Illinois by $1 billion by 2020.
- These energy efficiency initiatives use technologies and equipment that are widely available today.

Other analyses have reached similar conclusions on the availability and cost-effectiveness of energy efficiency. For example, an Interlaboratory Working Group following up on the Five National Labs study concluded adopting a number of policies directed at promoting energy-efficient technologies could reduce projected energy needs in 2020 by 20%.[5] The Interlaboratory Working Group determined that these energy efficiency efforts could save an amount of energy equal to 25% of the nation's current energy use.[6] The American Council for an Energy Efficient Economy ("ACEEE") found even greater potential for energy efficiency, concluding in a 2001 study that nine specific energy efficiency policies could reduce energy consumption by 11% by 2010 and 26% by 2020.[7] The net economic savings as a result of these efficiency efforts would be $170 billion through 2010 and more than $600 billion through 2020.[8] The ACEEE also determined that efficiency standards for 13 appliances and equipment alone could save 1.8 quads of energy, or 5% of projected residential and commercial sector energy use.[9] The benefit-to-cost ratio of such standards would be 5 to 1.[10] Finally, the Union of Concerned Scientists and the Tellus Institute determined in their Clean Energy Blueprint that energy efficiency efforts

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[5] Interlaboratory Working Group, *Scenarios for a Clean Energy Future* (Nov. 2000), p. ES.6 (Exhibit 5).
[6] *Id.*
[7] Steven Nadel and Howard Geller, *Smart Energy Policies: Saving Money and Reducing Pollutant Emissions Through Greater Energy Efficiency* (Sept. 2001), p. vii (Exhibit 6).
[8] *Id.* at i.
[9] Toru Kubo, *Opportunities for New Appliance and Equipment Efficiency Standards: Energy and Economic Savings Beyond Current Standards Programs* (Sept. 2001), p. ii (Exhibit 7).

throughout the United States could save 915 billion kilowatt-hours of electricity by 2010 and 2,512 billion kilowatt-hours by 2020.[11]

Energy efficiency efforts are feasible, and they also provide significant economic benefits. The follow-up *Job Jolt* analysis of the economic impacts of implementing the clean energy development recommendations in *Repowering the Midwest* concluded that investments in energy efficiency in Illinois would create 43,400 new jobs and $4.6 billion in additional economic output by 2020.[12] A 1998 ACEEE study of energy efficiency potential in Illinois reached similar results, concluding that investments in energy efficiency would create 59,400 jobs by 2015 and save consumers and business $76 billion in energy costs between 1999 and 2015.[13]

As the above studies show, energy efficiency is a technologically and economically feasible alternative – alone and in combination with other energy resources – to the siting of a new nuclear power plant at Clinton. Energy efficiency is a better, faster, cheaper, safer, and environmentally preferable alternative to a new nuclear power plant. Therefore, Exelon and the NRC are required to fully evaluate it as a reasonable alternative under NEPA.

E. The ER's Rejection Of Renewable Energy Resources Is Factually Flawed And Relies On Outdated Information.

The ER considers, but improperly rejects, a number of viable renewable energy resources. These resources, in combination with energy efficiency, represent a reasonable

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[10] *Id.*

[11] Steve Clemmer, et al., *Clean Energy Blueprint: A Smarter National Energy Policy for Today and the Future* (Oct. 2001), at 11 (Exhibit 8).

[12] Environmental Law and Policy Center, et al., *Job Jolt: The Economic Impacts of Repowering the Midwest* (2002), p. 7 (Exhibit 9).

[13] Marshall Goldberg, et al., *Energy Efficiency and Economic Development in Illinois* (Dec. 1998) (Exhibit 10).

alternative to siting a new nuclear plant at Clinton. Exelon, however, uses outdated and flawed information to reject these alternatives. For example, Exelon relies "heavily" upon the NRC's 1996 Generic Environmental Impact Statement for License Renewal of Nuclear Plants ("GEIS") for much of its data regarding alternative energy sources. (ER, p. 9.2-6). The data in the GEIS, which the NRC is in the process of revising, is mostly from the early 1990s and, it presents a very outdated view of the viability and environmental impacts of renewable energy resources including wind power, solar power, and distributed generation. Technological improvements and market developments since the early 1990s have greatly increased the efficiency and capacity of many renewable energy resources, while at the same time reducing their costs and environmental impacts. Exelon must provide, and the NRC must consider, the current information in analyzing renewable energy alternatives. *Cf. Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council*, 435 U.S. 519, 552-53 (1978) (recognizing that the concept of alternatives is an "evolving one" that an agency must judge "by the information then available to it.")

In addition, the ER's analysis of wind power, solar power, and distributed generation alternatives is flawed in several other ways as well.

1. The ER Ignores The Fact That Wind Power Is A Viable And Growing Source Of Clean Renewable Energy.

Exelon fails to acknowledge that wind power is a viable and growing source of energy that, both alone and in combination with energy efficiency and other energy resources, can be a reasonable alternative to the siting of a new nuclear power plant at Clinton.

First, wind resources in Illinois are sufficient to replace the power that would be generated by a new Clinton nuclear plant. According to the United States Department of

Energy's Wind Powering America study on wind resources in the state, Illinois has a potential capacity of at least 3,000 MW of Class 4 wind sites and 6,000 MW of Class 3+ wind sites.[14]

Second, technological advancements, as described below, and economic advantages have led to a substantial increase in the amount of wind power installed. From 2001 through 2003, a total of 3,795 megawatts of wind power was installed nationwide, raising the total wind power in the United States to 6,374 megawatts.[15] Within Illinois, the first utility-scale wind project has recently begun operations and approximately 1,700 MW of additional wind power projects are in various stages of development. Across the border in Iowa, there are 420 MW of wind power installed with an additional 345 MW in development.

Third, the ER treats wind power as if it would have to replace the power created by a new Clinton plant on its own. Instead, wind power should be considered in combination with energy efficiency and other clean energy resources as part of the NEPA-required rigorous exploration and objective evaluation of all reasonable alternatives. 40 C.F.R. 1502.14(a)

Fourth, technological advancements are increasing the amount of power created by wind turbines. Although the largest commercially available wind turbines in recent years were between 1 MW and 1.5 MW, now GE Wind Energy is producing 2.3 – 2.7 MW land-based turbines, and 3.6 MW turbines designed for offshore use.[16] 5 MW wind turbines may be

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[14] U.S. Department of Energy – Wind Powering America, *Illinois Wind Resource Maps*, http://www.eere.energy.gov/windpoweringamerica/where_is_wind_illinois.html (Exhibit 11).

[15] American Wind Energy Association, *Wind Power Outlook 2003* (2003); American Wind Energy Association, *Wind Energy Fast Facts* (Jan. 2004) (Exhibit 12).

[16] GE Wind Energy, *Our Products*, http://www.gepower.com/businesses/ge_wind_energy/en/products.htm (Exhibit 13)

available in the near future.[17] In addition, wind turbines have an availability factor of 98%, higher than most other power resources.[18]

Fifth, the cost of wind power has fallen dramatically since the 1980s, with an average generation cost of three to six cents per kilowatt-hour,[19] so that it is now competitive with most other energy resources. In addition, wind power generation has "zero fuel cost" and thus avoids risks of fluctuating fuel prices.

Sixth, the ER improperly limits its analysis to wind resources in Illinois. (ER, p. 9.2-7) Six of the 10 states with the highest wind power potential in the United States are in the Midwest.[20] Wind farms in neighboring states such as Iowa could be a viable source of energy for Illinois.

In light of these facts, the ER vastly exaggerates the impact that an expansion of wind power would have. Although the ER claims that it would take 330,000 acres of land to produce from wind the amount of power that would be created by a new Clinton nuclear plant (ER, p. 9.2-7), the ER neglects to note that at least 95% of the land for a wind power site remains available for agriculture and other uses. In addition, wind generation uses no coolant water, has no emissions and does not degrade land. Finally, contrary to the assertion in the ER (p. 9.2-8), recent studies show very few avian collisions with modern wind turbines.[21]

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[17] Ari Reeves, *Wind Energy For Electric Power: A REPP Issue Brief* (Nov. 2003), at 22 (Exhibit 14).
[18] American Wind Energy Association, *The Most Frequently Asked Questions About Wind Energy* (2002), p. 5 (Exhibit 15).
[19] American Wind Energy Association, *Comparative Costs of Wind and Other Energy Sources*, (2002) (Exhibit 16).
[20] American Wind Energy Association, *Wind Energy: An Untapped Resource* (2003) (Exhibit 17).
[21] National Wind Coordinating Committee, *Avian/Wind Turbine Interaction: A Short Summary of Research Results and Remaining Questions* (Dec. 2002).

2. <u>The ER Misstates The Impacts Of Solar Power</u>

The conclusion in the ER that Illinois would need 77,000 acre area of photovoltaic ("PV") cells or 30,800 acres of solar thermal systems to replace the power that would be produced by a new nuclear plant at Clinton (ER, p. 9.2-9) provides a distorted view of the impacts of solar power. In particular, the ER's suggestion that solar power would have a substantial impact on natural resources and land use ignores the fact that solar power is distributed power. Many solar power units are located on rooftops of buildings, meaning that solar power would not cause land disturbances.

In addition, the ER treats solar power as if would have to replace the power from a new Clinton plant on its own. Instead, as explained above, Exelon and the NRC should consider solar power in combination with energy efficiency and other clean energy resources as part of the NEPA-required rigorous exploration and objective evaluation of all reasonable alternatives. 40 C.F.R. 1502.14(a).

3. Distributed Generation Is A Relatively Clean Alternative <u>For Providing Base-Load Power</u>

The ER does not adequately address the opportunities for meeting base-load power needs through efficient on-site natural gas-fired generation, such as combined heat and power, district energy systems, and fuel cells. Natural gas distributed generation emits substantially less air pollution than coal-fired power plants, and does not pose the high-level waste and safety hazards inherent to nuclear power. It can serve as a relatively cleaner and safer base-load supplement to, and in combination with, energy efficiency and renewable energy resources as an alternative to the new Clinton nuclear power plant. *Repowering the Midwest* estimates that Illinois alone has

the potential for 2,162 MW of efficient distributed gas-fired generation by 2010, and 5,000 MW by 2020.[22]

Again, the ER treats this distributed generation as if it would have to replace the power from a new Clinton nuclear plant on its own. (ER, p. 92.12) Instead, distributed generation should be considered in combination with energy efficiency and other clean energy resources as part of the NEPA-required rigorous exploration and objective evaluation of all reasonable alternatives. 40 C.F.R. 1502.14(a).

CONTENTION 3.2: THE WASTE CONFIDENCE RULE CONTENTION -

The Waste Confidence Rule Does Not Apply to This Proceeding And Thus The Environmental Review Must Evaluate Whether And In What Time Frame Spent Fuel Generated By the Proposed New Clinton 2 Plant Can Be Safely Disposed Of.

The ER for the Clinton ESP application is deficient because it fails to discuss the environmental implications of the lack of options for permanent disposal of the irradiated (*i.e*, "spent") fuel that will be generated by the proposed new Clinton nuclear plant if it is built and operated. Nor has the NRC made an assessment on which Exelon can rely regarding the degree of assurance now available that radioactive waste generated by the proposed reactors "can be safely disposed of [and] when such disposal or off-site storage will be available." Final Waste Confidence Decision, 49 Fed. Reg. 34,658 (August 31, 1984), citing *State of Minnesota v. NRC*, 602 F.2d 412 (D.C. Cir. 1979). Accordingly, the ER fails to provide a sufficient discussion of the environmental impacts of the proposed new nuclear reactors.

Basis: The ER for the proposed new Clinton nuclear plant does not contain any discussion of the environmental implications of the lack of options for permanent disposal of the irradiated

[22] *Repowering the Midwest*, at p. 83.

fuel to be generated by a new reactor on the Clinton site. Therefore, it is fatally flawed. *State of Minnesota v. NRC,* 602 F.2d at 416-17.

While Exelon may have intended to rely on the NRC's Waste Confidence decision, issued in 1984 and most recently amended in 1999, that decision is inapplicable because it concerns plants that are currently operating, not new plants. The second finding of the Waste Confidence Decision, as amended in 1999, is that the NRC has:

> reasonable assurance that at least one mined geologic repository will be available within the first quarter of the twenty-first century, and that sufficient repository capacity will be available within 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of any reactor to dispose of the commercial high-level radioactive waste and spent fuel originating in such reactor and generated up until that time. (This finding revised the finding in the original decision that a mined geologic repository would be available by the years 2007 to 2009).

Waste Confidence Decision Review: Status, 64 Fed. Reg. 68,005, 68,006 (December 6, 1999). Clearly, the NRC's finding applies to any existing reactor, including reactors whose licenses are revised or renewed. The NRC gives no indication that it has confidence that repository space can be found for spent fuel and other high-level radioactive waste from new reactors licensed after December of 1999.

Moreover, the revised second finding in the 1999 Waste Confidence review statement fails to assert confidence in the likelihood that more than one repository will be licensed. In fact, the NRC has backtracked on its original 1984 "Nuclear Waste Confidence Decision," in which the NRC expressed confidence that "one or more" repositories would open between 2007 and 2009. Waste Confidence Decision, 49 Fed. Reg. at 34,673. The 1999 Status Report states merely that "at least one" repository will open by 2025. 64 Fed. Reg. at 68,006.

It is also clear that the inventory of spent fuel and other high-level radioactive waste being generated by the *current* generation of nuclear reactors is far greater than what can be

accommodated in the single repository – Yucca Mountain, Nevada – in which the NRC appears to place its confidence. The proposed Yucca Mountain repository can only accept 63,000 metric tons of commercial high-level radioactive waste and irradiated nuclear fuel, at least until a second national repository became operational.[23] Even assuming only 40 years of operations with no operating license renewals and no new nuclear reactors, the United States Department of Energy ("USDOE") has known since at least the mid-1990's – that is, since before the most recent NRC review in 1999 of its "Nuclear Waste Confidence Decision" – that by the year 2030 or so, well over 80,000 metric tons of irradiated nuclear fuel generated at commercial nuclear reactors will exist in the U.S.[24] This is significantly in excess of the "disposal" capacity at Yucca Mountain.

The NRC's recent approvals of 20-year license extensions to old commercial nuclear reactors will increase the quantity of high-level radioactive waste that exceeds the capacity limits at the proposed Yucca Mountain, Nevada repository. In its "Final Environmental Impact Statement for a Repository for Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca

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[23] Under the Nuclear Waste Policy Act ("NWPA"), 63,000 metric tons is the legal limit for commercial waste storage that can be "disposed of" at Yucca Mountain, Nevada, at least until a second repository is operational elsewhere in the U.S. As the NWPA states at Section 114(d):

> The [NRC] decision approving the first such application [for a license to open and operate a repository] shall prohibit the emplacement in the first repository of a quantity of spent fuel containing in excess of 70,000 metric tons of heavy metal or a quantity of solidified high-level radioactive waste resulting from the reprocessing of such a quantity of spent fuel until such time as a second repository is in operation…"

42 U.S.C. § 10134(d). By long-established USDOE policy, the first 70,000 metric tons of irradiated nuclear fuel and solidified high-level radioactive waste "disposed of" at Yucca Mountain, Nevada would include 90% commercial nuclear reactor waste, and 10% USDOE waste from the nuclear weapons production complex and nuclear energy research activities. 90% of 70,000 metric tons means that only 63,000 metric tons of commercial irradiated nuclear fuel could be "disposed of" at Yucca Mountain, Nevada, at least until a second national repository is operational in the United States. ***See*** Yucca Mountain EIS at A-1 (Exhibit 18).

Mountain, Nye County, Nevada," (February 2002) (hereinafter "Yucca Mountain EIS"), USDOE predicted the generation of over 105,000 metric tons of commercial irradiated nuclear fuel by the year 2046.[25] Although the NRC's standard license extension term is 20 years, the USDOE prediction assumed that the term of license extensions would be only 10 years. The USDOE also assumed no new commercial nuclear reactors would operate in the United States. Thus, the high-level waste and spent fuel generated by the *current* generation of reactors will far exceed the capacity of the single repository that the NRC has identified as feasible and likely.[26]

Accordingly, the spent fuel and other high-level radioactive wastes generated at the proposed new Clinton 2 nuclear plant could not be "disposed of" at Yucca Mountain unless and until a second national repository is operating. But the NRC has not expressed confidence that a second repository will open. Any spent fuel or other high-level radioactive waste generated after the year 2011 or so (after 63,000 metric tons of commercial irradiated nuclear fuel has been generated) would have nowhere to go, would lack "disposal" space at a repository, unless and until a second repository is opened and operating in the United States in addition to the Yucca Mountain, Nevada – a process that could take many decades, based on the experience of trying to open the first repository at Yucca Mountain, Nevada.

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[24] United States Nuclear Waste Technical Review Board ("NWTRB") "Disposal and Storage of Spent Nuclear Fuel: Finding the Right Balance," Figure 2 at page 11 (March 1996), (Exhibit 19).

[25] Yucca Mtn. EIS at Table A-8, page A-16 (Exhibit 20).

[26] Experience also shows that the NRC has been overly optimistic about the opening of the first repository. It took from 1982 (the year the Nuclear Waste Policy Act was passed) until 2002 – 20 full years – just for the USDOE to recommend Yucca Mountain as "suitable" for repository development (a recommendation, by the way, that is being challenged in federal court by the State of Nevada). Although DOE still predicts the Yucca Mountain repository will open by the year 2010, the General Accounting Office has reported that a repository at Yucca Mountain, Nevada probably could not open to receive waste shipments till 2015. GAO-02-191, "Nuclear Waste: Technical, Schedule, and Cost Uncertainties of the Yucca Mountain Repository Project" (December, 2001) (Exhibit 21). Even this date is doubtful, given the serious technical criticism of the USDOE's current repository design. *See, e.g.*, United States NWTRB, "Technical Report

Moreover, Congress has not given the NRC any basis for assuming that a second repository will be opened. Section 161(b) of the Nuclear Waste Policy Act provides that: "[t]he Secretary [of Energy] shall report to the President and to Congress on or after January 1, 2007, but not later than January 1, 2010, on the need for a second repository." 42 U.S.C. § 10172a(b). Section 161(a) also states that: "The Secretary [of Energy] may not conduct site-specific activities with respect to a second repository unless Congress has specifically authorized and appropriated funds for such activities." 42 U.S.C. § 10172a(a). The Secretary of Energy has not made a finding that a second repository is needed, nor has Congress specifically authorized or appropriated funds for site-specific activities.

The NRC's failure to express confidence that a second repository will be opened soon also implicates the third and fourth findings of the Waste Confidence Decision, *i.e*, that spent fuel and other high-level radioactive waste can be safely stored at reactor sites for up to 30 years. 64 Fed. Reg. at 68,006. If the NRC cannot express confidence that a second repository will open at some reasonable future time, it must be assumed that spent fuel may sit at the reactor site for an indefinite period of time. The environmental impacts of such indefinite storage must be evaluated before an ESP can be granted for the proposed new Clinton 2 nuclear plant.

II. MISCELLANEOUS CONTENTION

CONTENTION 5.1: ILLINOIS STATE MORATORIUM STATUTE CONTENTION - The Illinois State Law Imposing A Moratorium On New Nuclear Plants Forecloses The Issuance Of An Early Site Permit For Clinton 2.

Exelon's ESP permit application fails to address the Illinois statute, 220 ILCS 5/8-406(c), which prohibits any new nuclear power plant within the state until such time as the Director of

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on Localized Corrosion" (November 25, 2003) (Exhibit 22). In addition, several legal challenges have been filed against the Yucca Mountain repository and the proposed standards for operation.

the Illinois Environmental Protection Agency ("IEPA") finds that the United States government has identified and approved a demonstrable technology or means for the disposal of high-level nuclear waste. The Director of the IEPA has, properly, not made the requisite finding, meaning that no new nuclear plant may now be built in Illinois and the issuance of an ESP is legally foreclosed.

The NRC must deny the ESP application because to grant it would violate Illinois' legal determination that there is no appropriate site for a new nuclear power plant in Illinois until the problems of disposing of high-level nuclear wastes are solved. In particular, Illinois law, 220 ILCS 5/8-406(c), provides that:

> After the effective date of this amendatory Act of 1987, no construction shall commence on any new nuclear power plant to be located within this State, and no certificate of public convenience and necessity or other authorization shall be issued therefor by the Commission, until the Director of the Illinois Environmental Protection Agency finds that the United States Government, through its authorized agency, has identified and approved a demonstrable technology or means for the disposal of high level nuclear waste, or until such construction has been specifically approved by a statute enacted by the General Assembly

This moratorium law takes the common sense approach of foreclosing the possibility of new nuclear power plants in the state until the federal government "has identified and approved a demonstrable technology or means for the disposal of high level nuclear waste" or construction has been specifically authorized by the Illinois General Assembly (state legislature). In essence, the moratorium answers with a resounding "no" the question presented in this ESP proceeding: Is the Clinton site (or any other site in Illinois) appropriate for a new nuclear power plant? Therefore, the NRC cannot approve the Clinton site and must deny the ESP at this time.

Exelon incorrectly asserts in its answer to Petitioners' original Hearing Request and Petition to Intervene that the Illinois state moratorium law is irrelevant to this proceeding

because it prohibits only the construction of a new nuclear plant, not the siting of such a plant. In fact, the moratorium is relevant and controlling in this proceeding because it demonstrates the clear intent of Illinois to prohibit any new nuclear power plants in the state until the waste disposal problem is solved. For example, the moratorium is not limited to prohibiting only the "construction" of a new nuclear power plant - it also forbids the issuance of a certificate of public convenience and necessity or "other authorization" for such a plant by the Illinois Commerce Commission. In addition, at the time that the Illinois General Assembly passed the moratorium in 1987, the ESP process did not even exist. The moratorium references "construction" because in 1987 a company seeking to build a new nuclear plant would have needed to first obtain a construction permit. The NRC's changes to the permitting process since 1987 do not alter the fact that the moratorium clearly forecloses the necessary step towards building a new nuclear power plant in Illinois that the ESP would represent.

It is also important to note that the standard required for lifting the moratorium - that the federal government has "identified and approved a demonstrable technology or means for the disposal of high level nuclear waste" - will not be satisfied anytime in the near future. As explained more fully above, the only identified high-level nuclear waste disposal site, Yucca Mountain, will not open until at least 2010 if at all. In fact, the United States Department of Energy has not yet even submitted its application for the Yucca Mountain repository to the NRC.

Even more fundamentally, the Yucca Mountain site would not solve the waste disposal problem for a new nuclear plant such as Clinton 2. As presently conceived, Yucca Mountain would not have sufficient capacity to hold all of the wastes from existing nuclear plants, especially as the NRC is granting 20-year license extensions to some of those plants. Therefore,

the moratorium law would not be satisfied in this regard until there is a second high-level waste repository available.

III. STANDING

Petitioners demonstrated standing in their original Hearing Request and Petition to Intervene by submitting declarations from members of each Petitioner organization authorizing the Petitioners to represent their interests. In their response to that original Petition, the NRC Staff have challenged only the standing of Petitioner Nuclear Energy Information Service ("NEIS") on the ground that its two members, Samuel Galewsky and Sandra Lindberg, have authorized more than one Petitioner organization to represent their interests.

There is no legal reason why an individual cannot designate more than one organization as his or her representative, at least unless and until such time as a conflict from such multi-organization representation is shown to arise. Therefore, Petitioners contend that their original Petition adequately demonstrated the standing of each Petitioner organization, including NEIS. Should the Panel, however, determine that an individual cannot be represented by more than one organization, then Sandra Lindberg wishes to designate NEIS as the sole representative organization for her interests in this proceeding.

IV. CONCLUSION

For the foregoing reasons and for those stated in the Petitioner's original Hearing Request and Petition to Intervene, the named Petitioners have standing in this proceeding and are raising contentions that satisfy the admissibility requirements of 10 C.F.R. 2.309(f). Therefore, the Nuclear Regulatory Commission should grant the Petitioners' request for a hearing and petition to intervene in this proceeding.

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