RAS 7734

May 3, 2004

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

In the Matter of

Exelon Generation Company, LLC

(Early Site Permit for Clinton ESP Site)

Docket No. 52-007

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.

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SECY-02

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).
>
> 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,

Diane Curran[7]
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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.

CERTIFICATE OF SERVICE

I hereby certify that on May 3, 2004, copies of the foregoing CONTENTIONS OF BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE, NUCLEAR INFORMATION AND RESOURCE SERVICE, NUCLEAR ENERGY INFORMATION SERVICE, AND PUBLIC CITIZEN REGARDING EARLY SITE PERMIT APPLICATION FOR SITE OF CLINTON NUCLEAR POWER PLANT were served on the following by e-mail, Federal Express, and/or first-class mail, as indicated below:

G. Paul Bollwerk, III, Chair Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission 11545 Rockville Pike Rockville, MD 20852 (E-mail: GPB@nrc.gov) Also by Federal Express 301/415-7393	Dr. Anthony J. Baratta Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission 11545 Rockville Pike Rockville, MD 20852 (E-mail: ajb5@nrc.gov) Also by Federal Express 301/415-7393
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Diane Curran

EXHIBIT 2.1-1

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)

**DECLARATION OF DAVID A. LOCHBAUM,
NUCLEAR SAFETY ENGINEER,
IN SUPPORT OF PETITIONERS' CONTENTIONS**

Under penalty of perjury, I, David A. Lochbaum, make the following declaration:

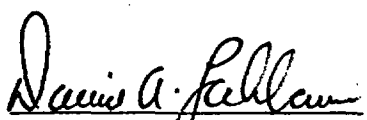
1. My name is David A. Lochbaum. I reside in the state of Maryland. I am employed by the Union of Concerned Scientists as its nuclear safety engineer. I have been so employed since October 1996. I have the following responsibilities: a) direct and coordinate UCS's nuclear safety program; b) monitor developments in nuclear industry to assess and respond to impact; c) serve as technical authority and spokesperson on nuclear issues; and d) initiate legal action to correct safety problems.

2. I am a graduate of the University of Tennessee with a bachelor of science in nuclear engineering. I have worked in the field of nuclear engineering since June of 1979. My seventeen years of employment experience in the nuclear industry are described in more detail in my resume, which is attached as Exhibit A to this declaration. I am qualified by training and experience to evaluate nuclear power plant designs and their interactions.

3. I have reviewed portions of Exelon Generating Company's Early Site Permit Application for two new reactors on the site of the Clinton nuclear power plant. I am also generally familiar with most of the advanced reactor designs that Exelon is considering for the Clinton site. In addition, I am familiar with the U.S. Nuclear Regulatory Commission's ("NRC's") regulations and regulatory practice.

4. I participated in the preparation of Petitioners' contentions regarding the inadequacy of Exelon's safety assessment and environmental report to consider the interaction between the design of the existing Clinton reactor and the proposed reactor(s).
5. The technical factual assertions in those contentions are true and correct to the best of my knowledge, and all expressions of technical opinion therein are based on my best professional judgment.

Executed May 3, 2004



David A. Lochbaum

EXHIBIT A

David A. Lochbaum

Experience Summary

10/96 to date *Nuclear Safety Engineer, Union of Concerned Scientists*

Responsible for directing UCS's nuclear safety program, for monitoring developments in the nuclear industry, for serving as the organization's spokesperson on nuclear safety issues, and for initiating action to correct safety concerns.

11/87 to 09/96 *Senior Consultant, Enercon Services, Inc.*

Responsible for developing the conceptual design package for the alternate decay heat removal system, for closing out partially implemented modifications, reducing the backlog of engineering items, and providing training on design and licensing bases issues at the Perry Nuclear Power Plant.

Responsible for developing a topical report on the station blackout licensing bases for the Connecticut Yankee plant.

Responsible for vertical slice assessment of the spent fuel pit cooling system and for confirmation of licensing commitment implementation at the Salem Generating Station.

Responsible for developing the primary containment isolation devices design basis document, reviewing the emergency diesel generators design basis document, resolving design document open items, and updating design basis documents for the James A. FitzPatrick Nuclear Power Plant.

Responsible for the design review of balance of plant systems and generating engineering calculations to support the Power Uprate Program for the Susquehanna Steam Electric Station.

Responsible for developing the reactor engineer training program, revising reactor engineering technical and surveillance procedures and providing power manuevering recommendations at the Hope Creek Generating Station.

Responsible for supporting the lead BWR/6 Technical Specification Improvement Program and preparing licensing submittals for the Grand Gulf Nuclear Station.

03/87 to 08/87 *System Engineer, General Technical Services*

Responsible for reviewing the design of the condensate, feedwater and raw service systems for safe shutdown and restart capabilities for the Browns Ferry Nuclear Plant.

08/83 to 02/87 *Senior Engineer, Enercon Services, Inc.*

Responsible for performing startup and surveillance testing, developing core monitoring software, developing the reactor engineer training program, and supervising the reactor engineers and Shift Technical Advisors at the Grand Gulf Nuclear Station.

Experience Summary (continued)

10/81 to 08/83 *Reactor Engineer / Shift Technical Advisor, Tennessee Valley Authority*

Responsible for performing core management functions, administering the nuclear engineer training program, maintaining ASME Section XI program for the core spray and CRD systems, and covering STA shifts at the Browns Ferry Nuclear Plant.

06/81 to 10/81 *BWR Instructor, General Electric Company*

Responsible for developing administrative procedures for the Independent Safety Engineering Group (ISEG) at the Grand Gulf Nuclear Station.

01/80 to 06/81 *Reactor Engineer / Shift Technical Advisor, Tennessee Valley Authority*

Responsible for directing refueling floor activities, performing core management functions, maintaining ASME Section XI program for the RHR system, providing power maneuvering recommendations and covering STA shifts at the Browns Ferry Nuclear Plant.

06/79 to 12/79 *Junior Engineer, Georgia Power Company*

Responsible for completing pre-operational testing of the radwaste solidification systems and developing design change packages for modifications to the liquid radwaste systems at the Edwin I. Hatch Nuclear Plant.

Education

June 1979	Bachelor of Science in Nuclear Engineering, The University of Tennessee at Knoxville
May 1980	Certification, Interim Shift Technical Advisor, TVA Browns Ferry Nuclear Plant
April 1982	Certification, Shift Technical Advisor, TVA Browns Ferry Nuclear Plant

Professional Affiliations

Member, American Nuclear Society (since 1978).

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U.S. Intelligence Official: Qaeda Posed Plane Threat

By REUTERS
Published: February 17, 2004

Filed at 3:26 p.m. ET

WASHINGTON (Reuters) - Al Qaeda has deployed operatives to hijack planes and fly them into targets in an echo of the Sept. 11 attacks and is looking at derailing trains possibly carrying hazardous material, according to a top U.S. intelligence official.

Robert Hutchings, chairman of the National Intelligence Council which reports to the CIA director, did not give details of the plots but provided the most recent public outline from an intelligence official of the al Qaeda threat.

The network, blamed for the Sept 11, 2001, attacks that killed 3,000 people, seeks targets that would strike a blow to the U.S. economy, Hutchings said in a Jan. 14 speech to the International Security Management Association in Arizona, the text of which was posted on Feb. 4 on the NIC's Web site.

"Soft targets, including the U.S. stock market, banks, major companies, and tall buildings are a primary focus of active al Qaeda planning," he said.

Those targets are seen as easier to hit than U.S. government buildings and major infrastructure, which have higher security, Hutchings said.

Al Qaeda has looked at derailing trains, perhaps carrying hazardous materials, to attack U.S. interests, he said.

Nuclear power plants, water treatment facilities, and other public utilities are high on al

Qaeda's target list, he said.

The U.S. government is concerned that al Qaeda will try to take its ability to build truck bombs as demonstrated by past attacks in Kenya, Saudi Arabia, and Turkey, and marry it with toxic or radioactive material to increase the damage and psychological impact of an attack, Hutchings said.

"My biggest worry, however, is how far al Qaeda might have progressed in being able to deploy a chemical, nuclear, or biological weapon against the United States or its allies," he said.

U.S. authorities have found several examples of al Qaeda adjusting its tactics to circumvent increased airline security, Hutchings said, without providing details.

"Although we have disrupted several airline plots, we have not eliminated the threat to airplanes," he said. "There are still al Qaeda operatives who we believe have been deployed to hijack planes and fly them into key targets."

The United States has beefed up security at airports and on airlines. There were a spate of flight cancellations since late December because of potential threats.

U.S. authorities have succeeded in disrupting the network, Hutchings said. "We have disrupted scores of plots at home and abroad -- plots that were audacious in terms of the numbers of attacks under consideration and their global scope," he said.

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EXHIBIT 2.2-2

NUREG/CR-5042
UCID-21223

Evaluation of External Hazards to Nuclear Power Plants in the United States

Manuscript Completed: October 1987
Date Published: December 1987

Prepared by
C. Y. Kimura, R. J. Budnitz*

Lawrence Livermore National Laboratory
7000 East Avenue
Livermore, CA 94550

Prepared for
Division of Reactor and Plant Systems
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
NRC FIN No. A0448 Task 8
NRC FIN No. A0815 Task 1

* Future Resources Associates, Inc.
2000 Center St., Suite 418
Berkeley, CA 94704

Table 6.4.2

Probability of Penetration as a Function of Plant Location and Concrete Thickness [Ref. 6.4.10]

Plant Location	Aircraft Type	Probability of Penetration — Thickness of Reinforced Concrete			
		1 foot	1.5 feet	2 feet	6 feet
<= 5 miles from airport	Small, <= 12,500 lbs.	0.003	0	0	0
	Large, < 12,500 lbs.	0.96	0.52	0.28	0
>= 5 miles from airport	Small, <= 12,500 lbs.	0.28	0.06	0.01	0
	Large, > 12,500 lbs.	1.0	1.0	0.84	0.32

< = defined as less than or equal to.
> = defined as greater than or equal to.

EXHIBIT 2.2-3

The Washington Post

http://www.washingtonpost.com/ac2/wp-dyn?pagename=article&contentId=A48190-2001Oct24&notFound=true

Nuclear Plants' Vulnerability Raised Attack Concerns 1982 Report on Danger of Jet Crashes Into Reactors Was Open to Public, Despite Terrorism Fears

By Peter Behr
Washington Post Staff Writer
Thursday, October 25, 2001; Page A04

A government study indicating that a direct, high-speed hit by a commercial jetliner could penetrate a nuclear reactor's protective dome was available to the public for nearly 20 years until it was removed after the Sept. 11 terrorist attacks, regulators confirmed yesterday.

The document remained public even though there have been warnings going back to 1995 that terrorists had included nuclear power plants among their potential targets, based on testimony in the investigation of the 1993 World Trade Center bombing.

A spokesman for the Nuclear Regulatory Commission said the agency would not discuss the contents of the report or its potential value to terrorists.

The study, by the Energy Department's Argonne National Laboratory, was prepared to assess the risks of an accidental airliner crash at a power plant.

It calculated the impact of objects as large as a commercial aircraft, traveling at various speeds, on the reinforced concrete containment dome protecting the reactor core of a common power-plant design. The study concluded that the dome would be penetrated at the highest flight speeds, according to the D.C.-based National Whistleblower Center, which provides legal representation for nuclear plant workers in whistle-blower lawsuits.

The ignition of a small percentage of an aircraft's jet fuel inside the containment dome would have the force of a 1,000 pounds of explosives and "could lead to a rather violent explosion environment and impose upon the primary containment relatively severe loads," according to the report.

"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," the study said.

"Therefore, the claim that these fire/explosion effects do not represent a threat to nuclear power plant facilities has not been clearly demonstrated."

The Whistleblower Center included excerpts of the report in a letter yesterday to Tom Ridge, head of the Office of Homeland Security.

The center also filed a petition with the NRC yesterday calling for further security measures to protect against an attack on nuclear power plants and a widespread release of radiation that could result if the reactor containment dome and core were destroyed.

At least one nuclear plant -- the Three Mile Island facility south of Harrisburg, Pa. -- was designed to withstand the impact of a Boeing 707, industry officials note.

But none of the nation's 103 nuclear power plants was built to withstand the direct, full-speed impact by today's commercial jetliners, NRC officials say.

Another advocacy organization, the Nuclear Control Institute, said its analysis shows that a reactor containment vessel could be penetrated by a jetliner's direct hit.

Nuclear industry officials have emphasized the strength of the reactor containment domes and the difficulty in steering a high-speed jetliner into a dome in the most damaging way. "I think there's a high likelihood that that aircraft would not penetrate the containment," Ralph Beedle, senior vice president of the Nuclear Energy Institute, said in an Oct. 14 television interview.

The 1982 study was mentioned in a Sept. 24 report by the publication Platts Inside NRC.

The Whistleblower Center said it found the document in the NRC's Bethesda public reading room on Oct. 2. "We asked a volunteer to look around the public reading room and see what was there on airplane crashes. And there it was," said Michael Kohn, the organization's general counsel.

NRC spokesman Victor Dricks said the NRC staff also found the study during a review of its public records following the Sept. 11 attacks and removed it on Oct. 11. He said he did not know whether it had ever been available over the NRC's public Internet documents service, but it is not on the agency's Web site now.

The risk of a terrorist attack in a hijacked aircraft has not been part of the NRC's safety regulation, officials confirm. "We never considered that a credible threat prior to September 11," Dricks said.

EXHIBIT 2.2-4

Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants

October 2000

3.5.2 Aircraft Crashes

The staff evaluated the likelihood that an aircraft crashing into a nuclear power plant site would seriously damage the spent fuel pool or its support systems (details are in Appendix 2D). The generic data provided in DOE-STD-3014-96 (Ref. 6) was used to assess the likelihood of an aircraft crash into or near a decommissioning spent fuel pool. Aircraft damage can affect the structural integrity of the spent fuel pool or the availability of nearby support systems, such as power supplies, heat exchangers, or water makeup sources, and may also affect recovery actions. There are two approaches to evaluating the likelihood of an aircraft crash into a structure. The first is the point target model, which uses the area (length times width) of the target to determine the likelihood that an aircraft will strike the target. The aircraft itself does not have real dimensions in this model. In the second approach, the DOE model modifies the point target approach to account for the wing span and the skidding of the aircraft after it hits the ground by including the additional area the aircraft could cover. The DOE model also takes into account the plane's glide path by introducing the height of the structure into the equation, which effectively increases the area of the target.

In estimating the frequency of catastrophic PWR spent fuel pool damage from an aircraft crash (i.e., the pool is so damaged that it rapidly drains and cannot be refilled from either onsite or offsite resources), the staff uses the point target area model and assumes a direct hit on a 100 x 50 foot spent fuel pool. Based on studies in NUREG/CR-5042, "Evaluation of External Hazards to Nuclear Power Plants in the United States," it is estimated that 1 of 2 aircrafts are large enough to penetrate a 5-foot-thick reinforced concrete wall. The conditional probability that a large aircraft crash will penetrate a 5-foot-thick reinforced concrete wall is taken as 0.45 (interpolated from NUREG/CR-5042). It is further estimated that 1 of 2 crashes damage the spent fuel pool enough to uncover the stored fuel (for example, 50 percent of the time the location of the damage is above the height of the stored fuel). The estimated range of catastrophic damage to the spent fuel pool resulting in uncovery of the spent fuel is 1.3×10^{-11} to 6.0×10^{-8} per year. The mean value is estimated to be 4.1×10^{-9} per year. The frequency of catastrophic BWR spent fuel pool damage resulting from a direct hit by a large aircraft is estimated to be the same as for a PWR. Mark-I and Mark-II secondary containments generally do not appear to have any significant structures that might reduce the likelihood of aircraft penetration, although a crash into 1 of 4 sides of a BWR secondary containment may be less likely to penetrate because other structures are in the way of the aircraft. Mark-III secondary containments may reduce the likelihood of penetration somewhat, since the spent fuel pool may be protected on one side by additional structures. If instead of a direct hit, the aircraft skids into the pool or a wing clips the pool, catastrophic damage may not occur. The staff estimates that skidding aircraft are negligible contributors to the frequency of fuel uncovery resulting from catastrophic damage to the pool because skidding decreases the impact velocity. The estimated frequencies of aircraft-induced catastrophic spent fuel pool failure are bounded by other initiators.

The staff estimated the frequency of significant damage to spent fuel pool support systems (e.g., power supply, heat exchanger, makeup water supply) for three different situations. The first case is based on the DOE model including the glide path and the wing and skid area and assumes a structure 400 x 200 x 30 feet (i.e., the large building housing the support systems) with a conditional probability of 0.01 that one of these systems is hit (the critical system

EXHIBIT 2.2-5

May 3, 2004

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

Docket No. 52-008

Dominion Nuclear North Anna, LLC

(Early Site Permit for North Anna ESP Site)

DECLARATION OF PAUL V. GUNTER

Under penalty of perjury, I, Paul V. Gunter, make the following declaration:

1. My name is Paul V. Gunter. I am director of the Reactor Watchdog Project at the Nuclear Information and Resource Service ("NIRS"). I have worked in that position since 1991.

2. My responsibilities as director of the Reactor Watchdog Project include monitoring NRC meetings and correspondence regarding safety and environmental issues affecting nuclear power plants.

3. On May 9, 2002, I attended a meeting at the headquarters of the U.S. Nuclear Regulatory Commission ("NRC"), regarding design certification of the AP 1000 advanced reactor design. I asked a member of the NRC Staff what was the thickness of the containment of the proposed AP 1000 design. He informed me that the thickness was 3 feet. To my knowledge, this information is not written in commonly available documents regarding the AP 1000 design.

Paul V. Gunter

May 3, 2004

EXHIBIT 2.2-6

Edward Teller to Sterling Cole, July 23 1953

The Honorable Sterling Cole
Chairman
Joint Committee on Atomic Energy
The Congress of the United States
Washington, D. C.

Dear Sir:

In response to your invitation to make a statement in connection with the development of atomic energy by private enterprise, I should like to discuss two topics concerning which I have some specific experience. These are the safety of nuclear reactors and the connection between power production and military application.

Briefly, my opinion can be stated as follows. First, nuclear power-producing units will be dangerous instruments and careful thought will have to be given to their safe construction and operation and, second, there is a great and increasing need for fissionable materials in the military field.

I should like to recommend:

First, that an advisory committee should be set up to review planned reactors and supervise functioning reactors under the control of private enterprise. Instead of setting up a new committee, the present Advisory Committee on Reactor Safeguards of the Atomic Energy Commission might serve this purpose, and Second, that the Government stimulate power production by private enterprise by guaranteeing to buy militarily useful by-products at a pre-determined price and in limited but large quantities for a period of five or ten years.

Safety of Nuclear Reactors
For the past six years I have served as the Chairman of the Reactor Safeguard Committee. Recently, this committee and the Industrial Committee on Reactor Location problems have been merged into the Advisory Committee on Reactor Safeguards, and I am participating in the work of this new committee.

Up to the present time we have been extremely fortunate in that accidents in nuclear reactors have not caused any fatalities. With expanding applications of nuclear reactions and nuclear power, it can not be expected that this unbroken record will be maintained. It must be realized that this good record was achieved to a considerable extent because of safety measures which have necessarily retarded development.

The main factors which influence reactor safety are, in my opinion, reasonably well understood. There have been in the past years a few minor incidents, all of which have been caused by neglect of clearly formulated safety rules. Such occasional accidents can not be avoided. It is rather remarkable that they have occurred in such a small number of instances. I want to emphasize in particular that the operation of nuclear reactors is not mysterious and that the irregularities are no more unexpected than accidents which happen on account of disregard of traffic regulations.

In the popular opinion, the main danger of a nuclear pile is due to the possibility that it may explode. It should be pointed out, however, that such an explosion, although possible, is likely to be harmful only in the immediate surroundings and will probably be limited in its destructive effects to the operators. A much greater public hazard is due to the fact that nuclear plants contain radioactive poisons. In a nuclear accident, these poisons may be liberated into the atmosphere or into the water supply. In fact, the radioactive poisons produced in a powerful nuclear reactor will retain a dangerous concentration even after they have been carried downwind to a distance of ten miles. Some danger might possibly persist to distances as great as 100 miles. It would seem appropriate that Federal regulations

should apply to a hazard which is not confined by state boundaries. The 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.

It is clear that no legislation will be able to stop future accidents and avoid completely occasional loss of life. It is my opinion that the unavoidable danger which will remain after all reasonable controls have been employed must not stand in the way of rapid development of nuclear power. It also would seem that proper legislation at the present time might make provisions for safe construction and safe operation of nuclear reactors. In case an accident should occur which involved the lives of many people, pressure for such legislation would become overwhelming. Proper steps taken at the present time could reasonably prepare for accidents and minimize the suffering that is caused, when and if they should occur.

It would seem reasonable to extend the Atomic Energy Commission procedures on reviewing planned reactors and supervising functioning reactors to nuclear plants under the control of private enterprise. To what extent these functions should be advisory or regulatory is a difficult question. I feel that ultimate responsibility for safe operation will have to be placed on the shoulders of the men and the organization most closely connected with the construction and the operation of the reactor.

Power Production and Military Application

The first and best known military application of atomic energy was con-nected with strategic bombing. In the popular mind, such strategic bombing has been identified with the destruction of cities. The belief is widely held that a relatively limited number of atomic bombs can not only cause terrifying destruction but would produce saturation, that is, only a limited number of atomic bombs would be needed. It is my conviction that this opinion is based on a misconception and that indeed a great stockpile of fissionable material could be usefully applied in warfare. Furthermore, it seems to me that a more general use of fission weapons will not result necessarily in a more thorough destruction of cities but might rather be used against military targets of the more conventional type. It seems to me therefore that a less expensive source of fissionable materials would be desirable. Such a less expensive source could be obtained if atomic reactors were constructed for the dual purpose of providing power and producing fissionable materials.

Strategic targets include industrial plants and military installations far behind the enemy's lines. Depending on the vulnerability of these targets and on their contribution to the enemy's war effort, one may well be justified in using atomic bombs against these targets. The size of the target need not be decisive and the number of such targets may be quite appreciable.

The possible tactical targets are even more numerous. Any concentration of fighting forces or of material near the fighting lines constitutes tactical targets. Strongly defended positions might be attacked by atomic bombs. Atomic weapons could be used against beachheads or against enemy forces attempting to cross a natural obstacle. Conversely, atomic weapons could be employed to prepare a landing on a beachhead or the attack of a parachute force. The vulnerability of naval vessels to atomic bombs has been demonstrated in the Bikini tests. Vehicles less expensive than naval units may present atomic bomb targets, particularly if the cost of the bomb is lower than the cost of the vehicle which one attempts to destroy. An enemy bomber or even an enemy fighter plane might be considered as a possible target for an atomic bomb.

It might seem extravagant to use atom bombs for all these different types of targets. The question of extravagance or of sound economy must be considered, however, in connection with the ease of delivery, with the expense of delivery and with the expense of the fissionable materials. I can think of no exception to the rule that the cost of delivery will be less if one produces a certain damage by atomic weapons rather than by more conventional means. It is therefore the cost of fissionable materials which will decide how extensively one can use atomic weapons in warfare. The more the cost of atomic weapons can be reduced, the greater will be the number of applications where relatively cheap delivery systems can replace the much more expensive conventional methods. Increase in our

stockpile of fissionable materials may therefore reduce the military expenditure without reducing military potential.

It seems to be doubtful whether, on the basis of present technology, atomic energy can produce power in an economically profitable manner. Power production can, however, be conducted in such a manner as to produce militarily useful materials. It would seem to me reasonable to stimulate the construction of power-producing reactors by guaranteeing a price at which the Government will buy the militarily useful by-products. This price should of course be set lower than the price at which the Atomic Energy Commission is producing fissionable materials at the present time. It probably will be necessary to set a limit to the amount of fissionable material which the Government is prepared to purchase and also to set a limit to the time during which such purchases will be made at the fixed price. Nevertheless, it seems probable that if a fair price is guaranteed for a period like five or ten years, this will be an effective stimulant to the nation's atomic power industry. This industry is likely to become a factor in national defense which may not be second even to the steel or aircraft industries.

The above contains the substance of the testimony which I have prepared for the joint Congressional Committee. I should like to express my very great regret that at the date set for the hearing it was completely impossible for me to leave Livermore. It would be a great pleasure to appear before the joint Congressional Committee at any time to amplify the above statements or else to help in any other way that you can think of.

Yours very truly,
Edward Teller

EXHIBIT 3.1-1

NUCLEAR ENERGY INSTITUTE

Dr. Ronald L. Simard
SENIOR DIRECTOR BUSINESS
SERVICES DEPARTMENT
BUSINESS OPERATIONS DIVISION

February 6, 2003

Mr. James E. Lyons
Director, New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Resolution of Generic Topic ESP-10 (Use of License Renewal Generic Environmental Impact Statement (NUREG-1437) for Early Site Permits)

Project No. 689

Dear Mr. Lyons:

In a public meeting with the NRC staff on September 25, 2002, we discussed generic topic ESP-10, which concerns the use of applicable information from NUREG-1437 (the license renewal GEIS) for the purposes of preparing environmental reports required for early site permit applications.

Our ESP-10 discussion focused primarily on applying to ESP the logic used by the NRC staff in evaluating the environmental issues associated with operating plant license renewal. We request that, by reply to this letter, the NRC confirm the understandings and expectations identified below that resulted from this discussion. To ensure timely resolution of generic issues and continued progress toward ESP applications in 2003, we request that NRC respond within 30 days.

1. The license renewal GEIS (NUREG-1437), as well as other NRC and industry reference material, may be used by ESP applicants, where applicable, to support NUREG-1555 guided evaluations. It is incumbent on ESP applicants to demonstrate the relevance of previously developed material (e.g., analyses, conclusions) to the evaluation of environmental issues in the ESP Environmental Report (ER).

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2. NRC regulations and NEPA focus on significant issues and direct the NRC to determine the significance of impacts to public health and safety and the environment (10 CFR 51.45(b)(1), 40 CFR 1502.1). To the extent that the Plant Parameters Envelope (PPE) and the site characteristics are consistent with environmental impact initiators that the NRC evaluated in NUREG-1437, conclusions regarding impact significance may be used as a guide in determining the level of analytical effort and detail necessary for the ESP ER. Where an ESP-related impact is bounded by a GEIS evaluation, the ESP ER will provide information sufficient to understand the basis for applicability and comparison, and may, as appropriate, adopt GEIS conclusions as to the significance of the impact.

3. Beyond guidance provided in NUREG-1555, the GEIS (including supporting rationale) provides operating experience bases, and may be used as a starting point for impact analysis. It is acknowledged, however, that new plant designs and changes in environmental management capabilities may require additional analyses when preparing an ESP ER.

4. License renewal GEIS evaluations and conclusions are not a substitute for evaluating issues for ESP purposes. In particular, the ESP ER must consider impacts of new plant construction and full term operation that the GEIS did not. Moreover, results from cost-benefit evaluations of mitigation strategies may be different for license renewal versus new plants. For purposes of early site permits, impacts of new plant construction and operation will be considered, and evaluation of mitigation strategies will be included at a level of detail commensurate with the significance of the environmental impact. The license renewal GEIS will be used as an input to these evaluations, as described in items 1, 2, and 3 above.

As identified in our November 26, 2002, issue resolution letter on ESP-20, "Use of Existing Site/Facility Information," the industry recognizes that the NRC's review of an ESP application is a new review. Applicant use of existing information will allow the NRC staff to minimize the resources it expends re-examining previously reviewed and approved information. Appropriate use of the license renewal GEIS and other existing information is expected to result in more efficient NRC reviews by allowing the staff to focus on changes since the existing information was previously compiled or reviewed, and on new information.

Enclosed for your use is an updated list and status of generic ESP topics that have been identified for discussion during the pre-application period.

We look forward to your confirmation of the understandings and expectations described above related to ESP-10. If you have any questions concerning this request, please contact Russ Bell (rjb@nei.org or 202-739-8087).

Sincerely,

R. Simard

Ron Simard

Enclosure

cc: Ronaldo V. Jenkins, NRC/NRR
Document Control Desk

Status of Generic ESP Interactions and Plans for Remaining Issues

ESP Topic Higher priority topics shaded	Initial Discussion	Next Discussion	NEI Resolution Letter	NRC Response	Potential Snr. Mgmnt Issue	ESP Schedule Impact if not Resolved by	Status/Remarks	Target Date for Resl'n Letter
1. ESP application form & content and ESP review guidance	8/22	3/5					• Preliminary industry comments on RS-002 to be discussed on 1/29 • Stakeholder comments due by 3/31 • RS-002 Review/Comment/Revision process to provide resolution vehicle for ESP-1	Later
2. ESP inspection guidance	4/24	3/5					• IMC-2501 to be conformed to resolution of ESP-3 (QA) • NEI to provide additional comments on IMC-2501 for discussion on Mar 5 • ESP inspection procedures to be completed to support June submittals	Mar. or April
2a. Pre-application interactions (voluntary nature, plans for local public mtgs & review fee structure)	4/24		11/26	1/10			Resolved	
3. QA requirements for ESP information	5/28		12/20	2/6		2/03	Evaluating NRC response	
4. Nominal NRC review timeline	10/17	3/5					• Industry timeline provided to NRC on 1/7/02 • NRC review timeline provided on 1/29 • Note ESP review process description in draft RS-002	Mar. or April
5. Mechanism for documenting resolution of ESP issues	5/28		9/10	11/5			Resolved	
6. Use of plant parameters envelope (PPE) approach	7/16		12/20	2/5		2/03	Evaluating NRC response	

Enclosure – 2/6/03

ESP Topic Higher priority topics shaded	Initial Discussion	Next Discussion	NEI Resolution Letter	NRC Response	Potential Smr. Mgmnt Issue	ESP Schedule Impact if not Resolved by	Status/Remarks	Target Date for Resl'n Letter
7. Guidance for satisfying §52.17(a)(1) requirements	7/16		12/20	2/5		2/03	• Evaluating NRC response	
8. Fuel cycle and transportation impacts (Tables S-3 & S-4)	9/25					3/03	• Preliminary industry assessment of current Tables S3 and S4 discussed w/NRC on Jan. 29	Feb.
9. Criteria for assuring control of the site by the ESP holder		3/5					• To be discussed w/NRC on Mar. 5	Mar. or April
10. Use of License Renewal GEIS for ESP	9/25		2/6				• Resolution Pending	Jan. or Feb.
11. Criteria for determining ESP duration (10-20 years)	12/5		12/20	2/5			Evaluating NRC response	
12. Guidance for evaluating severe accident mitigation alternatives under NEPA	8/22		12/20			2/03	• Resolution Pending	
13. Guidance for ESP seismic evaluations	10/16 11/13	3/5					• Applicants proceeding as described on Oct. 16 • Remaining issues, if any, to be identified for discussion on Mar. 5	Mar. or April
14. Applicability of Federal requirements concerning environmental justice	–	–					• Commission action pending in response to Dec. 20 NEI letter • No ESP-specific discussion of EJ or ESP-14 resolution letter necessary*	*No letter needed
15. Appropriate level of detail for site redress plans	9/25		11/26	1/16			Resolved	
16. Guidance for ESP approval of emergency plans	1/29						Resolution pending	Feb.

Enclosure – 2/6/03

ESP Topic Higher-priority topics shaded	Initial Discussion	Next Discussion	NEI Resolution Letter	NRC Response	Potential Snr. Mgmnt Issue	ESP Schedule Impact if not Resolved by	Status/Remarks	Target Date for Resl'n Letter
17. Petition to eliminate duplicative NRC review of valid existing site/facility information	–	–					• Commission action pending on petition PRM-52-1 • No ESP-specific discussion or ESP-17 resolution letter necessary*	*No letter needed
18. Petition to eliminate reviews for alternate sites, sources and need for power	–	–					• Supplemental industry comments on PRM-52-2 provided on Dec. 18 • Staff recommendation and Commission action pending • No ESP-specific discussion or ESP-18 resolution letter necessary*	*No letter needed
18a Alternative site reviews	12/5		12/20			3/03	Resolution Pending	
18x Need for alternative energy source evaluation and review	1/29						• Industry to provide additional input to NRC	Mar. or April
19. Addressing effects of potential new units at an existing site		3/5					• To be discussed w/NRC on Mar. 5	Mar. or April
20. Practical use of existing site/facility information	9/25		11/26	12/18			Resolved	
21. Understanding the interface of ESP with the COL process.		3/5					• Purpose is clarity of expectations regarding reference to an ESP by a COL applicant • Analogous to "COL Items" identified as part of the design certifications	Mar. or April
22. Form and content of an ESP	8/22	3/5					NEI Aug. 21 draft under consideration by NRC (also included as enclosure with 12/20 ESP-6 letter) Revisions under consideration and will be identified in ESP-22 letter	Mar. or April

EXHIBIT 3.1-2

June 25, 2003

Dr. Ronald L. Simard
Nuclear Energy Institute (NEI)
1776 I Street, NW, Suite 400
Washington, DC 20006-3708

SUBJECT: RESPONSE TO LETTER ON EARLY SITE PERMIT TOPIC 12 (ESP-12), NEPA CONSIDERATIONS OF SEVERE ACCIDENT ISSUES

Dear Dr. Simard:

The purpose of this letter is to respond to your second letter on the subject early site permit (ESP) topic dated April 28, 2003. In this letter, NEI outlined the approach that the prospective ESP applicants are going to use in preparation of their respective applications. NEI states that the approach was based on the March 26, 2003, public meeting to discuss the issue and is consistent with the staff position contained in the February 12, 2003 letter and SECY-91-041. This letter does not change any of the understandings and expectations stated in our letter dated February 12, 2003 regarding consideration of severe accidents. We confirm the understandings and expectations cited in your letter for the prospective ESP applicants with the clarifications as listed below:

Understandings and expectations:

1. The staff agrees. With respect to severe accident mitigation alternatives, the staff recognizes that if sufficient design information is not available at the ESP stage, then the NRC review and findings will be deferred to the COL stage.

2. The staff agrees. The staff expects the ESP applicants to include a discussion of severe accident impacts in their environmental reports.

3. The staff agrees. Draft ESP Review Standard RS-002 references ESRP Section 7.2 as one acceptable methodology for reviewing an applicant's severe accident impacts assessment.

4. The prospective ESP applicants have proposed to address the environmental impacts of severe accidents through a "comparative discussion" of the candidate sites with the evaluations and conclusions contained in generic NRC severe accident studies, and to demonstrate that the site-specific populations and meteorological characteristics are consistent with sites considered in the generic studies. Although a comparative discussion may provide insights into population and meteorological differences relative to previous studies, based on the level of information provided in the NEI letter it is not clear that this discussion will provide an adequate basis for concluding that the site contains no characteristics which make it unsuitable for construction and operation of a nuclear power plant.

The staff analyses of severe accident impacts would be similar in scope and content to the site-specific analyses of environmental impacts typically addressed in more recent site-specific final environmental impact statements and generic environmental impact statements (such as NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants"). These studies typically considered multiple exposure pathways (i.e., airborne releases, releases to groundwater, and fallout onto open bodies of water) and assessed impacts in terms of population exposure, early and latent fatalities, and economic costs. If the staff needs additional information to perform these analyses, then the staff will request that ESP applicants provide supplementary information as described above.

5. NEI states that the NRC will base its finding related to severe accident environmental impacts on the expectation that severe accident impacts of future nuclear plants will be bounded by those of existing plants, which have been determined to be "small." This expectation would be based on the Commission's 1985 Policy Statement on Severe Reactor Accidents Regarding Future Designs and Existing Plants.

   The NRC will perform its review on severe accident environmental impacts in accordance with ESRP Section 7.2. If specific plant design information is available (e.g., a detailed design with a Level 3 PRA), then this information would be used in the evaluation. However, even in the absence of a detailed plant design (e.g., the specific reactor type or technology is undecided), a severe accident impacts analysis is technically feasible at the ESP stage using a PPE approach and the existing guidance in ESRP Section 7.2. Such an approach could involve characterizing the spectrum of credible releases from candidate future plant designs, in terms of representative source terms and their respective frequencies, and using these release characteristics in conjunction with site-specific population and meteorology to determine site-specific risk impacts for the surrogate design. Release characteristics could be developed through a survey of severe accident analyses for previously certified ALWRs and/or operating reactors. Risk impacts could be assessed using the same metrics as in previous plant-specific and generic EISs, such as NUREG-0974, "Limerick 1 and 2 Operating License" and NUREG-1437. These metrics include population dose, early and latent fatalities, and economic costs. The metrics would be used to determine the acceptability of the proposed site at the ESP stage.

6. With respect to the provisions of 10 CFR 52.39, the staff expects that the COL application would demonstrate that the severe accident analysis performed for the ESP is bounding for the proposed facility. If a COL applicant adequately makes such a demonstration, then the applicant may avail themselves of 10 CFR 52.39.

Please contact Stephen Koenick at 301-415-2985, if you have any questions on this matter.

Sincerely,

/RA/

James E. Lyons, Director
New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation

Project No. 689

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Please contact Stephen Koenick at 301-415-2985, if you have any questions on this matter.

Sincerely,

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ACCESSION NO. ML031430282

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EXHIBIT 3.1-3

April 1, 2003

Dr. Ronald L. Simard
Nuclear Energy Institute (NEI)
1776 I Street, NW, Suite 400
Washington, DC 20006-3708

SUBJECT: RESOLUTION OF EARLY SITE PERMIT TOPIC 10 (ESP-10), USE OF LICENSE RENEWAL GENERIC ENVIRONMENTAL IMPACT STATEMENT (NUREG-1437) FOR EARLY SITE PERMITS

Dear Dr. Simard:

This letter confirms our understandings and expectations regarding the use of information contained in NUREG-1437, "Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Plants," for the purpose of preparing early site permits (ESP) issued under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, Subpart A. This topic, which is identified as ESP-10 on the list of Nuclear Energy Institute (NEI) generic ESP issues, was discussed during public meetings on January 10, July 16 and September 25, 2002 (Meeting Summary - ADAMS Accession Nos. ML020390320, ML021830280, and ML022900341 respectively). Subsequently, NEI documented its position on this topic in a letter dated February 6, 2003.

The Nuclear Regulatory Commission (NRC) has assessed the environmental impacts associated with granting a renewed operating license for a nuclear power plant to a licensee that holds either an operating license or construction permit as of June 1995. The GEIS is not directly applicable to any licensing action other than license renewal, but may be used just as any other technical resource, such as those that may be considered under ESP-20, "Practical use of existing site/facility information".

The GEIS identified 92 environmental issues and reached generic conclusions related to environmental impacts during the renewal term for 69 of these issues (known as Category 1 issues) that apply to all light-water-reactor (LWR) plants or to LWR plants with specific design or site characteristics. As discussed during the public meetings on this issue, the staff emphasized that there is a different technical basis and regulatory structure necessary for the evaluation of environmental impacts for ESP purposes. Therefore, all of the relevant environmental issues addressed in the GEIS will require detailed review as described in the Draft ESP Review Standard, which references NUREG-1555, "Environmental Standard Review Plan."

The NRC staff offers the following observations and clarifications to NEI's February 6, 2003, letter.

1. The NRC staff agrees with Item 1 of the subject NEI letter.

2. The NRC staff agrees with the text of the first sentence of Item 2 of the subject NEI letter in that "NRC regulations and the National Environmental Policy Act (NEPA) focus on significant issues and direct the NRC to determine the significance of impacts to public health and safety and the environment..."

However, the process suggested in Items 2, 3 and 4, and the concluding remarks of your letter implies that the ESP applicant can adopt the conclusions of the GEIS in its application without detailed knowledge of the design and operational characteristics of a facility that may be built on the proposed site. The GEIS documents the staff's evaluation of the environmental impacts of LWR reactors of known design, locations, and operating experiences. The analysis results documented in the GEIS may not be representative of the environmental impacts of a facility that could be built on the site proposed in an ESP application. Therefore, although the environmental impacts of the construction and operation of a nuclear facility located on the proposed site may be similar to those identified in the GEIS, it is incumbent on the ESP applicant to justify its conclusions regarding these impacts.

The NRC staff does believe that there may be useful insights in the GEIS that an ESP applicant can consider for its purposes in developing its environmental report, but, as stated above, the burden for justifying relevance and demonstrating completeness rests entirely with the applicant. In addition, the NRC retains the prerogative to utilize well-established NEPA techniques, such as tiering, cooperation and adoption, where the NRC believes that it is appropriate.

Please contact Ronaldo Jenkins, the ESP Senior Project Manager, at 301-415-2985 if you have any questions on this matter.

Sincerely,

/RA/

James E. Lyons, Director
New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation

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However, the process suggested in Items 2, 3 and 4, and the concluding remarks of your letter implies that the ESP applicant can adopt the conclusions of the GEIS in its application without detailed knowledge of the design and operational characteristics of a facility that may be built on the proposed site. The GEIS documents the staff's evaluation of the environmental impacts of LWR reactors of known design, locations, and operating experiences. The analysis results documented in the GEIS may not be representative of the environmental impacts of a facility that could be built on the site proposed in an ESP application. Therefore, although the environmental impacts of the construction and operation of a nuclear facility located on the proposed site may be similar to those identified in the GEIS, it is incumbent on the ESP applicant to justify its conclusions regarding these impacts.

The NRC staff does believe that there may be useful insights in the GEIS that an ESP applicant can consider for its purposes in developing its environmental report, but, as stated above, the burden for justifying relevance and demonstrating completeness rests entirely with the applicant. In addition, the NRC retains the prerogative to utilize well-established NEPA techniques, such as tiering, cooperation and adoption, where the NRC believes that it is appropriate.

Please contact Ronaldo Jenkins, the ESP Senior Project Manager, at 301-415-2985 if you have any questions on this matter.

Sincerely,

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*See previous concurrence

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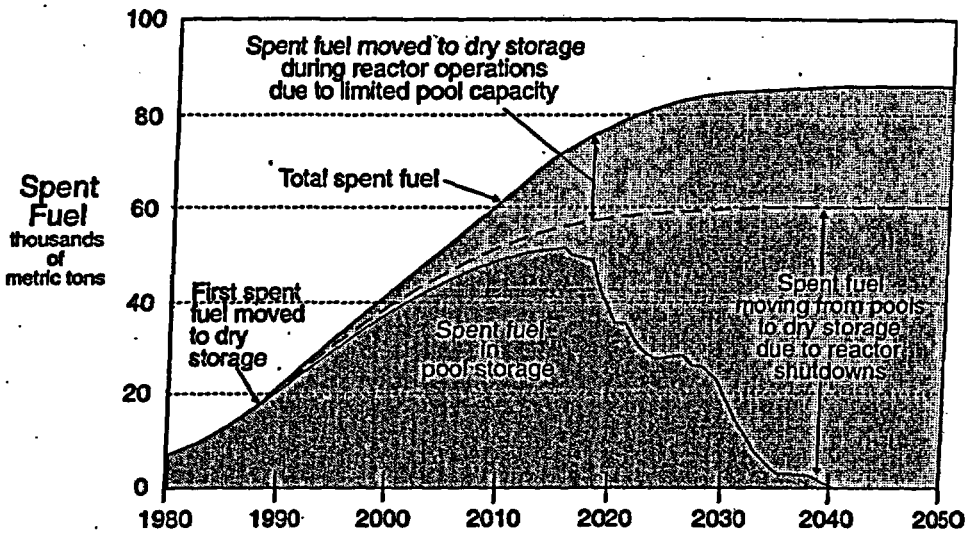
EXHIBIT 3.2.1-1

Disposal and Storage of Spent Nuclear Fuel — Finding the Right Balance

A Report to Congress
and
the Secretary of Energy

Nuclear Waste Technical Review Board
March 1996

Figure 2:
Movement of spent fuel from pools to dry storage under a no-repository scenario



Note: The figure showing spent fuel in pool storage assumes the movement of all spent fuel from pools to dry storage approximately five years after plant shutdown. Assumptions include: 40-year operating licenses with no renewals and no new plant orders; all spent fuel remains at reactors.

Source: Adapted from DOE, Spent Fuel Storage Requirements: 1992–2036, Dec. 1993 and DOE, Spent Fuel Storage Requirements: 1993–2040, Sept. 1994.

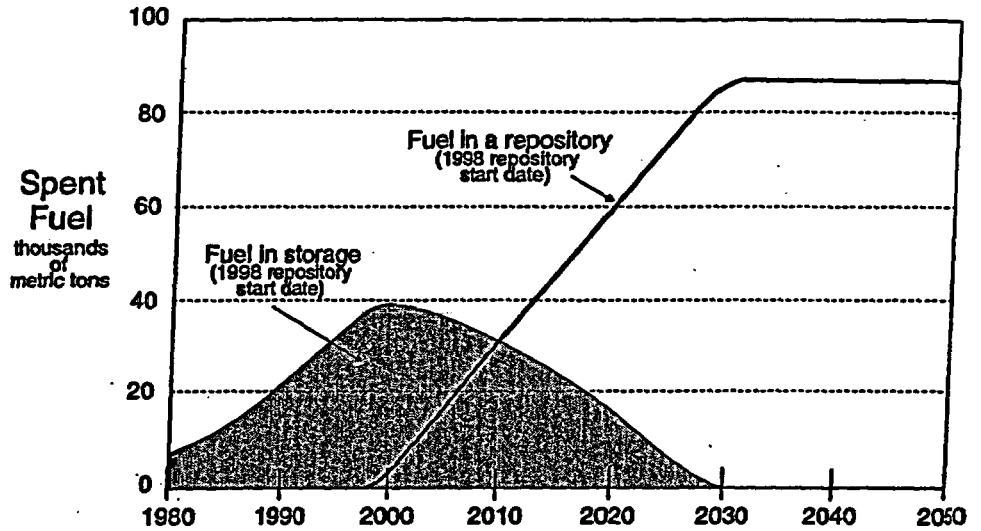
By the year 2000 alone, 25 plants are estimated to require additional spent fuel storage capacity (DOE 1993). Beginning in 2015, much of the fuel moving into dry storage probably will be at shutdown reactors. (See Figure 2.)

Planning for storage

As Figure 3 shows, in the early 1980s when repository operation was expected to begin in 1998, a maximum of about 40,000 metric tons of spent fuel were projected to require storage. Moreover, assuming the DOE's planning number of 3,000 metric tons shipped per year, all of the backlog could have been disposed of by the mid-2020s. On the other hand, if repository operations do not begin until sometime between 2015 and 2020,[4] nearly 80,000 metric tons of spent fuel will require storage. The spent fuel would not be disposed of completely until approximately 2050. As Figure 4 illustrates, each decade of delay

4 The Secretary of Energy projected in testimony submitted to the U.S. Senate that repository operations probably would not begin before 2015 (DOE 1995c).

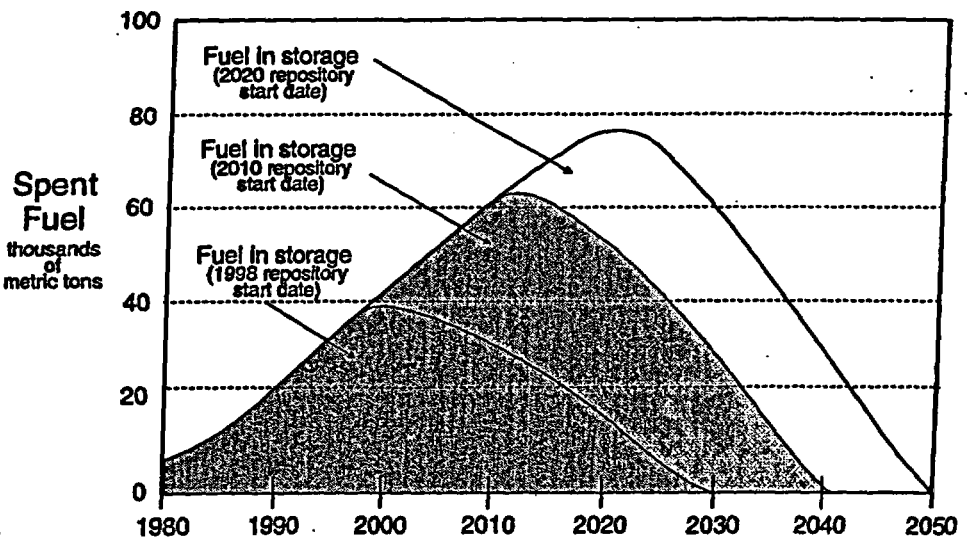
Figure 3:
Storage expectations in early 1980s when the repository start date was 1998



Note: Disposal curve based on 3,000 metric tons/year acceptance rate in a repository after a five-year ramp up. Curves assume 40-year operating licenses with no renewals and no new plant orders.

Source: Storage curves adapted from DOE, Spent Fuel Storage Requirements: 1993–2040, *Sept. 1994.*

Figure 4:
Repository delays increase storage needs by about 20,000 metric tons each decade



Note: Assumes 3,000 metric tons/year acceptance rate in a repository after a five-year ramp up. Curves assume 40-year operating licenses with no renewals and no new plant orders. Recent DOE estimates put repository start date at around 2015.

Source: Storage curves adapted from DOE, Spent Fuel Storage Requirements: 1993–2040, *Sept. 1994.*

EXHIBIT 3.2.1-2

May 16, 2002

Energy and Natural Resources Committee

Statement of Spencer Abraham
Secretary of Energy Before the
Energy and Natural Resources Committee
United States Senate

Mr. Chairman and Members of the Subcommittee, I am pleased to appear before you today.

On February 14, I forwarded a recommendation to the President, based on approximately 24 years of federal research, that Yucca Mountain, Nevada, is suitable for development as the nation's geologic repository for spent nuclear fuel and high-level radioactive wastes. The President officially recommended the site to Congress on February 15, and pursuant to the Nuclear Waste Policy Act of 1982 (NWPA), the State of Nevada has exercised a disapproval of the President's recommendation.

I am greatly encouraged that on May 8 the House of Representatives voted, by an overwhelming margin, to pass the Joint Resolution before you today. The expeditious manner in which the House acted, and the wide margin and bipartisan manner by which the Joint Resolution passed, clearly signal this Nation's confidence and readiness to take the next step toward resolving the challenges of permanent waste disposal. Without delay, I ask that the Senate also pass the Joint Resolution, so that the Department may enter the next phase of repository development an expert and independent scientific and technical examination of the safety of the site by the Nuclear Regulatory Commission.

Passing this Joint Resolution, thus overriding the State of Nevada's disapproval, hardly needs emphasis. Twenty years ago, Congress established in law the Federal government's responsibility for the disposal of spent nuclear fuel and high-level radioactive waste. In doing so, Congress foresaw the fundamental national security and energy policy considerations that weigh heavily in favor of proceeding with a geologic repository, and mandated that a repository program be based upon a thorough scientific evaluation of several candidate sites. In 1987, Congress limited that evaluation to the site we consider today: Yucca Mountain.

In formulating this recommendation, I first considered whether sound science supported a determination that the Yucca Mountain site was scientifically and technically suitable for the development of a repository. The scientific evaluation of the Yucca Mountain site had been conducted over a 24-year period; as part of the study, some of the world's best scientists examined every aspect of the natural processes—past, present, and future—that could affect the ability of a repository beneath Yucca Mountain to isolate radionuclides released from any spent fuel and radioactive waste disposed of there.

The Department's scientific inquiries and modeling clearly demonstrate that a repository at Yucca Mountain can meet the Environmental Protection Agency's standards for protecting the health and safety of our citizens. These extremely stringent standards were based on the recommendations of the National Academy of Sciences. What they mean, in terms of the Yucca Mountain site, is that a person living 11 miles away from the site cannot receive more annual radiation exposure during the 10,000-year regulatory period than a traveler receives today from natural sources in three round trip flights from Las Vegas to New York.

In evaluating whether the repository can comply with the Agency's standards, our scientists employed extremely conservative assumptions and considered the impact of events with extremely low probability of occurrence, all erring on the side of public safety. For example, earthquakes were assumed to occur, and volcanic eruptions were evaluated–even though the likelihood of a volcanic event affecting the repository during the first 10,000 years is just one in 70 million per year. Even with these unlikely events analyzed into the Agency's 10,000 year compliance period, Yucca Mountain still meets the EPA

standards.

A review of the documentation that accompanied the recommendation clearly reveals that the Department has carefully evaluated the extent to which Yucca Mountain's substantial natural geologic barriers work in concert with the robust engineered systems. We know that Yucca Mountain is in a closed hydrologic basin, a geologic feature that greatly limits the potential migration of radionuclides. Between the emplacement tunnels and the water table, which is approximately 2000 feet below the surface, the geology provides natural adsorption retarding any potential radionuclide movement. The hydrologic features at this site suggest that more than ninety percent of the annual rainfall runs off or is evaporated, meaning less than a half an inch of water travels beneath the surface. Our studies indicate that the vast majority of water samples taken from the mountain are thousands of years old.

Even with this robust geology, our scientists again conservatively considered how engineered barriers 1,000 feet below the surface and 1,000 feet above the water table might corrode by analyzing what would happen during an ice age, if Nevada's climate changed and rainfall increased dramatically. Even including these scenarios, Yucca Mountain still meets the EPA standards.

After thoroughly examining the relevant scientific and technical materials, I have concluded that they demonstrate that the site is scientifically and technically suitable for construction of a repository. As I stated in my recommendation to the President:

> "Irrespective of any other considerations, I could not and would not recommend the Yucca Mountain site without having first determined that a repository at Yucca Mountain will bring together the location, natural barriers, and design elements necessary to protect the health and safety of the public, including those Americans living in the immediate vicinity, now and into the future."

Having reached this conclusion, I went on to evaluate whether compelling national interests counseled in favor of moving forward with a geologic repository at Yucca Mountain, and if so, whether there were countervailing arguments so strong that I should nonetheless decline to proceed. This evaluation argued strongly in favor of proceeding, and certainly that there was no basis for abandoning the policy decisions made by the Congress in enacting the 1982 Nuclear Waste Policy Act and the 1987 amendments to that Act. In short, the relevant considerations are as follows.

First, Yucca Mountain is critical to our national security. Today, over forty percent of our Navy's combatant vessels, including aircraft carriers and submarines, are nuclear powered. The additional capabilities that nuclear power brings to these platforms is essential to national security. To maintain operational readiness, we must assure disposal of spent fuel to support refueling of these vessels. We are in the midst of advancing the non-proliferation objectives that have been the welcome result of the end of the Cold War. A geologic repository is an integral part of our disposition plans for surplus weapons grade materials.

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.

A repository is also important to our nation's energy security. Nuclear power provides 20 percent of the nation's electricity and emits no greenhouse gases. The reactors we have today give us one of the most reliable forms of carbon-free power generation, free from interruptions due to international events and price fluctuations. This nation must develop a permanent, safe, and secure site for disposal of spent nuclear fuel if we are to continue to rely on our 103 operating commercial reactors to provide us with electricity.

And a repository is important to our efforts to protect the environment. A repository is indispensable to implementing an environmentally sound disposition plan for high-level defense wastes, which are located in Colorado, Idaho, South Carolina, New Mexico, New York, Tennessee, and Washington. The Department must move forward and dispose of these materials, which include approximately 100 million gallons of high-level radioactive waste and 2,500 metric tons of defense production spent nuclear fuel.

Finally, I carefully considered the primary arguments against locating a repository at Yucca Mountain. None of these arguments rose to a level that

outweighs the case for going forward with the site designation.

Of these, the only one I shall address in my prepared testimony is the concern critics of the project have raised about the "transportation issue." I wish to address this issue briefly, not because I believe there is any real basis for believing these concerns are warranted, but rather, because I believe that simply by incanting the words "transportation of nuclear waste," opponents are hoping they can incite public fear, without any basis in fact, and that this hope has become the last refuge for opposition to the project. The facts, however, are these.

First, the Nuclear Regulatory Commission, working with the Departments of Transportation and Energy, has overseen approximately 30 years of safe shipment of spent nuclear fuel in this country. The Department and commercial nuclear industry have substantial experience to date –some 1.6 million miles-- without any harmful radiation release. And the successful and extensive European experience in transporting this type of nuclear material corroborates our experience. The transportation of this material will involve approximately 175 shipments per year, not the 2,600 that the opponents allege. It would also constitute 0.00006% of the annual hazardous material shipments, and 0.006% of the annual radioactive material shipments that occur in this country today.

Second, because the site has not yet been designated, the Department is just beginning to formulate its preliminary thoughts about a transportation plan. There is an eight-year period before any transportation to Yucca Mountain might occur. This will afford ample time to implement a program that builds upon our record of safe and orderly transportation of nuclear materials and makes improvements to it where appropriate. Thus any suggestion that the Department has chosen any particular route or mechanism is completely fictitious. Those decisions have not been made, and cannot possibly start to be made until the site has been designated and the Department has the opportunity to work with affected States, local governments, and other entities on how to proceed.

Third, even without a repository at Yucca Mountain, the need to find a place to put the spent fuel that is continuing to accumulate will lead to the transportation of these materials, and likely quite soon. On-site storage space is running out and not all utilities can find new adjacent land where they can put this material. Therefore, they will devise ad hoc off-site consolidated storage alternatives. Already a consortium of utilities is working on a facility that they have presented to the NRC. Whether or not this effort ultimately succeeds, it is likely that some similar effort will. Thus the transportation of nuclear materials is not a function of a repository at Yucca Mountain, but rather is a necessary consequence of the material that continues to accumulate at the 131 sites in 39 States that are running out of room for it.

Finally, Yucca Mountain critics argue that nuclear materials in transit could be a terrorist target. But they are forgetting the obvious: spent fuel in secure transit to a permanent repository is certainly less susceptible to terrorist acts than spent fuel stranded at the temporary, stationary sites -- many very close to major cities and waterways -- where it now resides.

Let me close with one last thought. The critics of this program would have Congress overturn the fundamental decisions it legislated 15 years ago – that a single underground repository located at Yucca Mountain holds the greatest promise for the long-term safety and security for the Nation. The great body of scientific work done since then has confirmed the fundamental soundness of the Yucca Mountain site. The only issues remaining are the type that only can be resolved in a Nuclear Regulatory Commission licensing proceeding.

The critics who would upend this path to resolution of the remaining issues have a heavy burden of proof in urging that the policy decision made by Congress in 1987 and the findings of the body of scientific work that examined Yucca Mountain both be abandoned before the NRC has even had the opportunity to pass on whether a repository can safely be sited there. Given the history and the work to date, their burden would be substantial even if this project were not critical to many important national interests. But it is. Rejection of the proposed resolution would leave the country with no ultimate destination for our spent naval fuel, no adequate path for disposing of our own surplus plutonium, thereby making it hard for us to press other countries to dispose of theirs, and no means to complete the environmental cleanup of our defense complex. Utilities may have to start planning to decommission existing nuclear reactors and figuring out how to replace them. Congress would still have to formulate an alternative in view of the statutory obligation that the Government dispose of commercial spent fuel that was legislated in 1982, but that would be no easy task.

In short, a decision to oppose this project's going forward at this stage is a decision to abandon the repository program and subject the country to these consequences without ever letting neutral experts at the Nuclear Regulatory Commission decide whether that is the right course. Nothing the critics of this project have advanced comes close to meeting the burden of proof they should have to satisfy to warrant proceeding in this fashion. Opposition to nuclear power is not a sufficient ground, since we all, and the United States Government in particular, have an obligation to safely dispose of this waste regardless of any such policy view. Nor are concerns about transportation, for all the reasons outlined above. Rather, opposition to this resolution, and to submitting this question to the NRC, seems warranted only if one is convinced that there is such overwhelming evidence that a repository at Yucca Mountain cannot meet the NRC and EPA standards that it would be a waste of time and money to use the ordinary NRC processes to find out.

Support for the proposed resolution, on the other hand, does not require being convinced that the Department of Energy is right in believing that a repository at Yucca Mountain will meet the applicable standards or that the NRC will decide it should be licensed -- although in my judgment the scientific work to date provides ample basis for reaching that conclusion. Indeed, it doesn't even require being convinced that this outcome is the most likely. Rather, all that is required to support the resolution is to believe there is enough of a serious possibility that $4 billion and 24 years of scientific research have produced a sufficient basis for our conclusion that the site can be safely developed as a repository. That conclusion will then subject the extensive scientific basis for the President's recommendation to objective testing in the only official context it can be -- an NRC licensing proceeding.

I urge the Senate now to act promptly and favorably on the proposed joint resolution, as the House has done so overwhelmingly on May 6. This will allow the Department to proceed with the next stage of addressing the merits of all remaining issues, by applying the independent expertise of the Nuclear Regulatory Commission.