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March 27, 2002

Mark Langer, Clerk
U.S. Court of Appeals
For the District of Columbia Circuit
3rd and Constitution Avenues N.W.
Washington, D.C. 20001

SUBJECT: *Orange County v. NRC, Nos. 01-1073 and 01-1246*

Dear Mr. Langer,

On behalf of Orange County, North Carolina, I am enclosing seven copies of the initial brief in the above-captioned proceeding. Copies have been served on the parties.

Sincerely,

Diane Curran

Encl: As Stated
Cc. w/Encl.: Service list

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CASE SCHEDULED FOR ORAL ARGUMENT SEPTEMBER 5, 2002

In the

United States Court of Appeals
For the District of Columbia Circuit

Nos. 01-1073 and 01-1246 (Consolidated)

ORANGE COUNTY, NORTH CAROLINA

Petitioner

v.

UNITED STATES NUCLEAR REGULATORY COMMISSION
And the UNITED STATES OF AMERICA,

Respondents

CAROLINA POWER & LIGHT COMPANY

Intervenor-Respondent

PETITION TO REVIEW A FINAL DECISION OF THE
U.S. NUCLEAR REGULATORY COMMISSION

INITIAL BRIEF FOR PETITIONER

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Dated: March 27, 2002

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

ORANGE COUNTY, NORTH CAROLINA, Petitioner, v. UNITED STATES NUCLEAR REGULATORY COMMISSION and the UNITED STATES OF AMERICA, Respondents CAROLINA POWER & LIGHT Intervenor-Respondents	Nos. 01-1073, 01-1246 (Consolidated)

CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES

The undersigned, counsel of record for Petitioner Board of Commissioners of Orange County, North Carolina, certifies the following regarding parties, rulings, and related cases:

Parties and Amici: The parties to this case are Orange County (Petitioner), the U.S. Nuclear Regulatory Commission (Respondent), and the United States of America (co-Respondent). Carolina Power & Light Co. has been admitted as an intervenor-respondent. There are no amici.

Rulings Under Review: The rulings under review are: United States Nuclear Regulatory Commission, *Carolina Power & Light Company,* Docket No. 50-400, Notice of Issuance of Amendment to Facility Operating License and Final Determination of No Significant Hazards Consideration (December 21, 2001); *Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), LBP-00-19, 52 NRC 85 (2000); and *Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), LBP-01-09, 53 NRC 239

(2001). These decisions relate to the NRC's issuance of an operating license amendment to CP&L for expansion of spent fuel storage capacity at its Harris nuclear power plant.

Related Cases

There are no related cases, either previously or currently pending before this Court or any other court.

Respectfully submitted,

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March 27, 2002

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

ORANGE COUNTY, NORTH CAROLINA, Petitioner, v. UNITED STATES NUCLEAR REGULATORY COMMISSION and the UNITED STATES OF AMERICA, Respondents CAROLINA POWER & LIGHT Intervenor-Respondents	Nos. 01-1073, 01-1246 (Consolidated)

CERTIFICATE REQUIRED BY FRAP 32(A)(7)(C)
REGARDING WORD COUNT

The undersigned, counsel of record for Petitioner Board of Commissioners of Orange County, North Carolina, certifies that the number of words in the Initial Brief for Petitioner, excluding the Table of Contents, Table of Authorities, Glossary, Addendum, and certificates of counsel, is 13,656, as counted by the Microsoft Word program.

Respectfully submitted,

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March 27, 2002

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Glossary of Abbreviations and Acronyms

BWR	Boiling Water Reactor
CLI-01-07	*Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), CLI-01-07, 53 NRC 113 (2001)
CLI-01-11	*Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), CLI-01-11, 53 NRC 370 (2001)
CP&L	Carolina Power & Light Co.
Detailed Summary	Detailed Summary of Facts, Data, and Arguments and Sworn Submission on which Orange County Intends to Rely at Oral Argument to Demonstrate the Existence of a Genuine and Substantial Dispute with the Licensee Regarding the Proposed Expansion of Spent Fuel Storage Capacity at the Harris Nuclear Power Plant with Respect to the Need to Prepare an Environmental Impact Statement to Address the Increased Risk of a Spent Fuel Pool Accident (November 20, 2000)
Draft Technical Study	*Draft Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants*
EA	Environmental Assessment
EIS	Environmental Impact Statement
Environmental Contentions	Orange County's Request for Late-Filed Admission of Environmental Contentions (January 31, 2000)
EPA PAGs	U.S. EPA, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (October 1991)
FONSI	Finding of No Significant Impact
GEIS	Generic Environmental Impact Statement, NUREG-0575, Handling and Storage of Spent Light Water Power Reactor Fuel (1979)
Harris 1983 EIS	NUREG-0972, Final Environmental Statement Related to the Operation of Shearon Harris Nuclear Power Plant Units 1 and 2, Docket Nos. STN 50-400 and 50-401, Carolina Power and Light Company (October 1983)
LBP-00-19	*Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), LBP-00-19, 52 NRC 85 (2000)
LBP-01-09	*Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), LBP-01-09, 53 NRC 239 (2001)
NEPA	National Environmental Policy Act
NRC	U.S. Nuclear Regulatory Commission
NRC Motion	Federal Respondents' Opposition to Petitioner's Motion to Reactivate and Consolidate and Motion to Dismiss or Alternatively, to Continue in Abeyance at 7 (July 23, 2001)

NSH Comments	Orange County's Comments in Opposition to No Significant Hazards Determination and Conditional Request for a Stay of Effectiveness (February 12, 1999)
NSH Determination	No Significant Hazards Consideration
NUREG-1353	NUREG-1353, Regulatory Analysis for the Resolution of Generic Issue 82, Beyond Design Basis Accidents in Spent Fuel Pools" at ES-1 (1989)
NUREG-1465	NUREG-1465, *Accident Source Terms for Light-Water Nuclear Power Plants* (February 1995)
NUREG-1570	NUREG-1570, *Risk Assessment of Severe Accident-Induced Steam Generator Tube Rupture* (March 1998)
NUREG/CR-0649	*NUREG/CR-0649, Spent Fuel Heatup Following Loss of Water During Storage* (1979)
NUREG/CR-6331	*NUREG/CR-6331, Atmospheric Relative Concentrations in Building Wakes* (1997)
NWPA	Nuclear Waste Policy Act
OA tr.	Transcript of December 7, 2000 oral argument
Orange County	Board of Commissioners of Orange County
PWR	Pressurized Water Reactor
SAMDAs	Severe Accident Mitigation Design Alternatives
Schmitz and Papin study	Franz Schmitz and Joelle Papin, *High burnup effects on fuel behavior under accident conditions: the tests CABRI REP-Na 270*, Journal of Nuclear Materials 55 (1999)
Shearon Harris	Shearon Harris Nuclear Power Plant
TEDE	Total Effective Dose Equivalent
Thompson 1999 Report	Gordon Thompson, *Risks and Alternative Options Associated with Spent Fuel Storage at the Shearon Harris Nuclear Power Plant* at 1 (February 1999)
Thompson 2000 Report	Gordon Thompson, *The Potential for a Large, Atmospheric Release of Radioactive Material From Spent Fuel Pools at the Harris Nuclear Power Plant: The Case of a Pool Release Initiated by a Severe Reactor Accident* at 13 (November 20, 2000)

BRIEF FOR PETITIONER

I. JURISDICTIONAL STATEMENT

This case involves two consolidated appeals, Nos. 01-1073 and 01-1246, in which the U.S. Nuclear Regulatory Commission ("NRC") has issued final orders that dispose of all of Orange County's claims in an NRC licensing proceeding. The Court has jurisdiction over both appeals pursuant to 28 U.S.C. § 2342(a), the Atomic Energy Act, 42 U.S.C. § 2239(a), and the Administrative Procedure Act, 5 U.S.C. § 702. In No. 01-1073, the NRC made a final decision on December 21, 2000, which the Board of Commissioners of Orange County (hereinafter "Orange County") appealed on February 16, 2001. In No. 01-1246, the NRC's decision became final on May 10, 2001, and Orange County appealed it on May 31, 2001.

II. STATUTES AND REGULATIONS

Relevant statutes and regulations are included in an addendum to this brief.

III. ISSUES PRESENTED FOR REVIEW

(1) Did the NRC violate the National Environmental Policy Act ("NEPA") by excluding relevant environmental considerations from the scope of an evidentiary proceeding on the probability of a severe accident in the spent fuel pools at the Harris nuclear power plant?

(2) Did the NRC violate its own regulations governing the admissibility of contentions for a hearing?

(3) In ruling on the probability of a single seven-step accident scenario leading to a spent fuel pool fire, did the NRC impermissibly shift the burden of proof from the NRC Staff to Orange County?

(4) Was the NRC's ruling on the probability of a single seven-step accident scenario leading to a spent fuel pool fire arbitrary and capricious?

(5) Was the NRC's decision to issue a license to Carolina Power & Light Co. ("CP&L") before conclusion of a hearing arbitrary and capricious and in violation of NRC regulations and NEPA?

IV. STATEMENT OF THE CASE

In this NEPA appeal, Orange County seeks reversal of three NRC decisions that resulted in the granting of a license amendment to CP&L for its Harris nuclear power plant in North Carolina.[1] CP&L requested the license amendment in order to address its mounting inventory of spent nuclear fuel, for which there is no currently available means of permanent disposal.[2] In the interim, CP&L's storage method has been to place spent fuel assemblies in racks in the pools that are present on its reactor site. In its application to the NRC, CP&L sought to place 4,715 spent fuel assemblies in two previously unused pools (pools "C" and "D"). In order to maximize the amount of spent fuel that could be placed in each pool, CP&L proposed to use closed-frame "high-density" racks. These racks have a substantially different design than the open-frame low-density racks that initially were used for spent fuel storage at nuclear power plants.

In 1999, Orange County, a neighbor of the Harris plant, sought a hearing before the NRC on CP&L's proposed license amendment. Orange County was concerned that the design of high-density storage racks makes spent fuel vulnerable to fire if water is lost from the pools, resulting in a catastrophic radiological release to the surrounding area.

Consequently, Orange County submitted a contention that, before the license amendment could be issued, the NRC must prepare an Environmental Impact Statement ("EIS") that

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1 The nuclear plant is also known as "Shearon Harris."

2 While the Department of Energy recently made an announcement that it considers Nevada's Yucca Mountain to be a suitable site for a repository for spent fuel and other radioactive waste, that decision will be subject to challenge by the State of Nevada and other

addressed the environmental impacts of a severe accident in the spent fuel storage pools. In addition, an EIS would evaluate the alternative technology of dry storage, which would completely avoid the danger of a pool fire.

The NRC admitted Orange County's contention for litigation, but limited it to only one portion: the question of whether a single accident scenario was probable enough to warrant consideration in an EIS. *Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), LBP-00-19, 52 NRC 85 (2000) (hereinafter "LBP-00-19"), J.A. __. LBP-00-19 excluded consideration of other relevant potential accidents identified by Orange County, or the overall probability of an accident.

After a summary evidentiary proceeding on the admitted portion of Orange County's contention, the NRC dismissed it in *Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), LBP-01-09, 53 NRC 239 (2001) (hereinafter "LBP-01-09"), J.A. __. The NRC found that the NRC Staff had met its burden of proof to show that the accident postulated by Orange County was so remote and speculative as to preclude the necessity for an EIS, and that there was no need for a full trial-type hearing to explore that issue.

Prior to the NRC's decision to reject the credibility of Orange County's posited accident scenario, the NRC prematurely issued the license amendment to CP&L. United States Nuclear Regulatory Commission, *Carolina Power & Light Company,* Docket No. 50-400, Notice of Issuance of Amendment to Facility Operating License and Final Determination of No Significant Hazards Consideration (hereinafter "NSH Determination"), J.A. ___. The NRC claimed that the license amendment satisfied the agency's requirements for an exemption to the prior hearing requirement of the Atomic Energy Act.

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parties. Yucca Mountain must also be licensed by the NRC before it can open.

Orange County sought review of each of these three decisions within the agency.[3] In *Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), CLI-01-07, 53 NRC 113 (2001) (hereinafter "CLI-01-07") [J.A. __], the Commission called for further briefing by the NRC Staff, without granting the County's petition for review of the NSH Determination. Several weeks later, the Commission issued CLI-01-11, in which it denied Orange County's petition for review of LBP-00-19 and LBP-01-09 [53 NRC at 394, J.A. __], and terminated its consideration of the NSH Determination on the ground that it was no longer relevant. 53 NRC at 381 n. 1, J.A. __.

Orange County petitioned this Court for review of the NSH Determination on February 16, 2001; and LBP-01-09 on May 31, 2001. These cases were docketed as Nos. 01-1073 and 01-1246, respectively. On April 22, 2001, the Court granted Orange County's unopposed motion to hold No. 01-1073 in abeyance. On June 1, 2001, Orange County filed a stay motion in No. 01-126, which was denied by an order dated June 29, 2001. On July 11, 2001, Orange County moved to reactivate No. 01-1073 and consolidate it with No. 01-1246. The NRC and CP&L opposed the motion, and counter-moved for dismissal of No. 01-1073. In an order dated October 22, 2001, the Court granted the motion to consolidate and the motion to reactivate No. 01-1073, and ordered that the parties address all issues relevant to both cases in this brief, including the arguments made in the motions to dismiss.

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3 Orange County's Petition for Review and Request for Immediate Suspension and Stay of the NRC Staff's No Significant Hazards Determination and Issuance of License Amendment for Harris Spent Fuel Pool Expansion (December 22, 2000); Orange County's Petition for Review of LBP-00-12, LBP-00-19, and LBP-01-09 (March 16, 2001).

V. STATUTORY FRAMEWORK

A. Atomic Energy Act

1. Hearing requirements of the Atomic Energy Act

Section 189a of the Atomic Energy Act generally requires that the NRC must provide interested members of the public with a prior opportunity for a hearing on any proposed licensing action. 42 U.S.C. § 2239(a)(1)(A). NRC regulations for implementation of NEPA permit the use of § 189a hearings to challenge the NRC's failure to prepare an EIS. 10 C.F.R. § 51.104(b). Throughout the hearing, the applicant bears the burden of proof. 10 C.F.R. § 2.732. As a general rule, licensing proceedings for nuclear power plants are trial-type hearings under 10 C.F.R. Part 2, Subpart G.

A petitioner for a hearing must file "contentions" that set forth, with "basis and specificity," the concerns the petitioner seeks to litigate. 10 C.F.R. § 2.714(b). Contentions must be supported by "sufficient information . . . to show that a genuine dispute exists with the applicant on a material issue of law or fact." *Id.* The scope of the hearing is restricted to the contentions that have been admitted by the ASLB panel that is assigned to hear the case.

2. Determinations of no significant hazards considerations

In the 1983 "Sholly Amendment" to the Atomic Energy Act, Congress made an exception to the prior hearing requirement for license amendments that involve "no significant hazards considerations." 42 U.S.C. § 2239(a)(2). Pursuant to this provision, the NRC may issue a license amendment before completion of a hearing, if it would not:

> (1) Involve a significant increase in the probability or consequences of an accident previously evaluated;
> (2) Create the possibility of a new or different kind of accident from any accident

previously evaluated; or
(3) Involve a significant reduction in a margin of safety.

10 C.F.R. § 50.92(c)(1)-(3). A determination of no significant hazards considerations must be proposed for comment in the Federal Register before it can be put into effect. 42 U.S.C. § 2239(a)(2)(B) and (C), 10 C.F.R. § 50.91(a). A final determination is subject to judicial review under 42 U.S.C. § 2239(b). It is not reviewable by the Commission. 10 C.F.R. § 50.58(b)(6).

B. Nuclear Waste Policy Act

In 1982, Congress passed the Nuclear Waste Policy Act ("NWPA"), 42 U.S.C. § 10101, *et seq.* Among other things, the NWPA adds an intermediate discretionary procedural step to the § 189a hearing process, intended to expedite cases involving expansion of spent nuclear fuel storage capacity at nuclear power plants. 42 U.S.C. § 10154(a). By requesting an "oral argument," any party can trigger a series of hybrid steps in which the parties are allowed to conduct discovery, and then must submit sworn testimony or affidavits and written summaries of facts, data, and arguments on which they intend to rely at oral argument. *Id.* The NRC must evaluate the presentations to determine whether the evidence warrants a full trial-type hearing, under the following standard:

> (1) At the conclusion of any oral argument under subsection (a) of this section, the Commission shall designate any disputed question of fact, together with any remaining questions of law, for resolution in an adjudicatory hearing only if it determines that –
> (A) there is a genuine and substantial dispute of fact which can only be resolved with sufficient accuracy by the introduction of evidence in an adjudicatory hearing; and
> (B) the decision of the Commission is likely to depend in whole or in part on the resolution of such dispute.

42 U.S.C. § 10154(b)(1). Although the NWPA directs the NRC to "encourage and expedite" the "effective use of available storage, and necessary additional storage," it does not permit NRC to override the basic hearing requirement in § 189a of the Atomic Energy Act, NEPA, protection of

public health and safety, or other applicable laws. 42 U.S.C. §§ 10152(1), (4).

NRC's implementing regulations, codified in Subpart K of 10 C.F.R. Part 2, are virtually identical to the language of 42 U.S.C. § 10154(b)(1). *See* 10 C.F.R. §§ 2.1113, 2.1115. In addition, the Subpart K rules contain a provision that expedites discovery. 10 C.F.R. § 2.1111. In a Subpart K proceeding, although the intervenor bears the burden of showing a genuine and substantial material issue of fact that should go to a hearing, the Staff bears the burden of proof on NEPA issues. LBP-01-09, 53 NRC at 248-49. To the extent the applicant supports the Staff's position, it also shares the burden of proof. *Id.*

C. National Environmental Policy Act

NEPA is the "basic charter for protection of the environment." 40 C.F.R. § 1500.1. Its fundamental purpose is to "help public officials make decisions that are based on understanding of environmental consequences, and take decisions that protect, restore and enhance the environment." *Id.* NEPA requires federal agencies to examine the environmental consequences of their actions *before* taking those actions, in order to ensure "that important effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989). The primary method by which NEPA ensures that its mandate is met is the "action-forcing" requirement for preparation of an EIS, which assesses the environmental impacts of the proposed action and weighs the costs and benefits of alternative actions. *Id.* *Robertson v. Methow Valley,* 490 U.S. at 350-51. In an EIS for spent fuel pool storage, for example, the NRC would be required to give a full accounting of the risks of spent fuel pool storage, and would also have to examine alternative technologies for avoiding or mitigating the risk, such as dry storage. *See* discussion at VI.B.1.b, *infra.*

1. Consideration of reasonably foreseeable impacts required

The environmental impacts that must be considered in an EIS include "reasonably foreseeable" impacts which have "catastrophic consequences, even if their probability of occurrence is low." 40 C.F.R. § 1502.22(b)(1). However, environmental impacts that are "remote and speculative" need not be considered. *Limerick Ecology Action,* 869 F.2d 719, 745 (3rd Cir. 1989), citing *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Counsel, Inc.,* 435 U.S. 519, 551 (1978).

In determining whether a particular accident scenario is "reasonably foreseeable," the NRC has held that low probability in quantitative terms is "key." *Vermont Yankee Nuclear Power Corp.* (Vermont Yankee Nuclear Power Station), CLI-90-7, 32 NRC 129, 131 (1990). The NRC has not fixed a line of demarcation between probability that is considered "reasonably foreseeable" and probability that is considered "remote and speculative." CLI-01-11, 53 NRC at 388 note 8. However, the Commission has refused to rule out an accident probability of 10^{-4} per year as remote and speculative. *Vermont Yankee Nuclear Power Corp.* (Vermont Yankee Nuclear Power Station), CLI-90-4, 31 NRC 333, 334 (1990). As the ASLB observed in LBP-00-19, the Commission's ruling in *Vermont Yankee* suggests that a probability of 10^{-5} per year should not be rejected out of hand as remote and speculative. 52 NRC at 97.

2. Continuing duty to consider new information

A federal agency "has a continuing duty to gather and evaluate new information relevant to the environmental impact of its actions." *Warm Springs Dam Task Force v. Gribble,* 621 F.2d 1017, 1023-24 (9th Cir. 1980), citing 42 U.S.C. § 4332(2)(A), (B). "When new information comes to light the agency must consider it, evaluate it, and make a reasoned determination whether it is of such significance as to require implementation of formal NEPA filing

procedures." *Id. See also Friends of the Clearwater v. Dombeck,* 222 F.3d 552, 558 (9th Cir. 2000) (finding "no evidence in the record" that Forest Service had considered new information bearing on sufficiency of programmatic EIS to support individual timber sale). Where aspects of a proposed action are addressed by a previously prepared EIS, a new EIS must be issued if there remains "major federal action" to occur, and if there is new information showing that the remaining action will affect the quality of the human environment "in a significant manner or to a significant extent not already considered." *Marsh v. Oregon Natural Resources Council,* 490 U.S. 360, 374 (1989).

VI. STATEMENT OF FACTS

A. Description of the Petitioner

Orange County is a political subdivision of the State of North Carolina, charged with carrying out state policies on a local level and authorized to protect the citizens of the County through its police powers. The entire county lies within the 50-mile "Ingestion Pathway Zone"[4] around the Harris facility, and part of the county lies within 15 miles of the plant. The Harris plant lies within 30 miles of the county seat in Hillsboro, and within 20 miles of Chapel Hill, a major population center in Orange County.

B. Environmental Impacts of Spent Fuel Storage

At a commercial nuclear power plant, electricity is generated by fission reactions in radioactive "fuel rods" in the plant's reactor.[5] Fuel rods are grouped together in "assemblies." After a fuel assembly is "spent" in the sense that it no longer can be used to generate power, it is discharged from the reactor. However, at this point in its life the assembly is much more dangerous than when it entered the reactor. It emits heat and intense radiation, and contains a large inventory of radioactive material. Gordon Thompson, *Risks and Alternative Options Associated with Spent Fuel Storage at the Shearon Harris Nuclear Power Plant* at 1 (February 1999) (hereinafter "Thompson 1999 Report"), J.A. __.

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4 The Ingestion Pathway Zone defines an emergency planning area where the expected principal exposure to radiation would be through the ingestion of contaminated water or food. *See* NUREG-0654, Rev. 1, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants* (1980); 10 C.F.R. § 50.47(c)(2).

5 Harris is a pressurized water reactor ("PWR"). The other common type of reactor is a boiling water reactor ("BWR.").

1. Alternative methods for spent fuel storage

Essentially, there are two available methods of storing spent fuel: wet and dry storage.

a. Wet storage

U.S. nuclear power plant designs always include one or more fuel storage pools. These pools are connected to the reactor vessel during refueling operations, which occur under water. In addition, the pools have space for storage of spent fuel. The fuel assemblies are stored vertically in racks and are kept cool by circulation of water. In turn, the water is extracted from the pool, cooled in heat exchangers, and then returned to the pool.

When the present generation of nuclear power plants first began operation in the 1970s, their spent fuel pools were equipped with low-density, open-frame racks. These racks allowed free circulation of water around the fuel assemblies. If water were lost from a pool equipped with open-frame racks, air or steam could circulate freely through the fuel assemblies, thereby cooling the assemblies. As a result, the fuel cladding would ignite, if at all, only in rare conditions. Thompson 1999 Report at 12, J.A. __.

Over the past two decades, spent fuel inventories at nuclear plants have mounted, due to the lack of other means of spent fuel management. Plant licensees have responded to this problem by substantially increasing the density at which fuel is stored in the existing spent fuel pools. Center-center distances have been reduced to as little as nine inches for PWR fuel. In order to increase the density of storage, licensees have been obliged to use racks in which each fuel assembly is surrounded by solid, neutron-absorbing panels. These panels are needed to suppress criticality, or a runaway chain reaction. The panels limit the flow of coolant (water, air or steam) to a mode of circulation in which the coolant enters each rack cell from below, rises vertically through the cell, and leaves the cell at its top. If water is lost from a pool equipped

with racks of this kind, the fuel cladding will ignite over a wide range of conditions. *See* discussion, *infra,* at 15-16 and note 8.

b. Dry storage

Dry storage is an alternative to wet storage that involves placement of the spent fuel in containers (casks or canisters) that are filled with a noncorrosive gas such as helium. Cooling is achieved by convective (i.e., passive) circulation of air over the fuel containers. In comparison with high-density pool storage, dry storage is more expensive because it requires the purchase and installation of new equipment. However, dry storage eliminates the potential for a pool fire and, if properly executed, dramatically reduces the potential for other modes of release of the radioactive material in spent fuel. Thompson 1999 Report at 11-12, J.A. __.

2. Spent Fuel Pool Hazards

By allowing nuclear power plant licensees to adopt high-density storage of spent fuel in pools, the NRC has created the potential for pool fires leading to large radioactive releases to the environment. This hazard did not exist when the present generation of nuclear plants first entered service, and spent fuel pools were equipped with low-density, open-frame racks.

In a pool fire, which could be described more precisely as a "self-propagating exothermic oxidation reaction," air or steam would react with the zirconium alloy cladding of the spent fuel and, potentially, with other materials in the pool. Radioactive material would be released from the spent fuel to the interior of the fuel handling building and from there to the outside atmosphere. The material released to the atmosphere would then travel downwind in a plume and contaminate the surrounding offsite environment. Thompson 1999 Report at B-1, D-1, Appendix E, J.A. ____.

At Harris, a pool fire could release 70 million Curies of radioactive cesium-137, which

has a half-life of 30 years. In typical weather conditions, this release would contaminate an area of land greater than the area of North Carolina. Note that the Chernobyl accident released about 2 million Curies of cesium-137, a small fraction of the release that would occur for a typical pool fire at Harris. Thompson 1999 Report at 11-12, J.A. __.

C. NRC EISs Regarding Severe Accident Risks in Spent Fuel Storage Pools

1. Most recent EIS for spent fuel pool risk was prepared in 1979.

Since the early 1980's, the EISs for the licensing of all U.S. nuclear plants have considered the potential for severe accidents in nuclear reactors, involving degradation of the reactor core. The NRC has invested considerable resources in understanding the behavior of reactor core accidents, and has conducted in-depth probabilistic risk assessments regarding the risks of degraded core accidents. Gordon Thompson, *The Potential for a Large, Atmospheric Release of Radioactive Material From Spent Fuel Pools at the Harris Nuclear Power Plant: The Case of a Pool Release Initiated by a Severe Reactor Accident* at 13 (November 20, 2000) (hereinafter "Thompson 2000 Report"), J.A. ___.

Although spent fuel pools hold the majority of the radiological inventory of nuclear power plants, no comparable effort has been made with respect to understanding spent fuel pool accidents. This omission has been based on the findings of the NRC's first major study of reactor accidents, the Reactor Safety Study (WASH-1400), that the risks of beyond-design-basis accidents in spent fuel pools were orders of magnitude below the risks of a reactor core accident. *See NUREG-1353, Regulatory Analysis for the Resolution of Generic Issue 82, Beyond Design Basis Accidents in Spent Fuel Pools"* at ES-1 (1989) (hereinafter "NUREG-1353"). Therefore, the potential for spent fuel pool accidents is not evaluated in EISs for the licensing of individual

nuclear power plants.[6]

In 1979, the NRC prepared a generic EIS on the environmental impacts of spent fuel storage, which includes a discussion of spent fuel pool accidents. NUREG-0575, Handling and Storage of Spent Light Water Power Reactor Fuel (1979) (hereinafter "GEIS"). The GEIS concluded that:

> Increased spent fuel storage with AR [at reactor] or AFR [away-from-reactor] storage normally involves only aged fuel. The underwater storage of aged spent fuels is an operation involving an extremely low risk of a catastrophic release of radioactivity.

Id. at 4-13, J.A. __. For virtually all of the accidents considered, the NRC assumed that the water level in the pool would not fall, and concluded that an accident under water would not lead to a significant offsite release. GEIS at 4-17 –4-22, J.A. __. In Section 4.2.3.7, the NRC did consider the effects of a lowering of the water level in a spent fuel pool, and concluded that:

> While the loss of all water is beyond the design basis envelope, it involves only low risks for independent spent fuel storage installations in which only aged spent fuel is stored. The major consequence of such an unlikely event would be a small skyshine dose at a site boundary.

Id. at 4-21, J.A. __. Thus, the GEIS examined only a complete loss of water from the spent fuel pool, not a partial loss of water. Moreover, it assumed that aged fuel would not burn.[7] As a result, the GEIS discounted the environmental impacts of atmospheric dispersion of radioactive contamination. The GEIS has not been updated since it was issued over 20 years ago.

2. New information regarding spent fuel pool accident risks

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6 In 1983, for example, the NRC Staff prepared an EIS in connection with the proposed issuance of an operating license for the Harris nuclear power plant, Units 1 and 2. NUREG-0972, Final Environmental Statement Related to the Operation of Shearon Harris Nuclear Power Plant Units 1 and 2, Docket Nos. STN 50-400 and 50-401, Carolina Power and Light Company (October 1983) (hereinafter "Harris 1983 EIS"). The EIS examined reactor accidents only, and did not evaluate spent fuel pool accidents.

7 Aged fuel is spent fuel that was not recently discharged from the reactor. Generally,

In 1979, Sandia National Laboratories, an NRC contractor, issued a report on the behavior of spent fuel storage pools under drainage conditions, including partial drainage. *NUREG/CR-0649, Spent Fuel Heatup Following Loss of Water During Storage* (1979), *cited in* Thompson 1999 Report at D-7 – D-8, J.A. __. The study shows the suppression of air cooling due to the presence of residual water, creating the conditions for a runaway reaction between the air and the zirconium cladding on the fuel assemblies. Although the analysis used a crude heat transfer model and neglected to consider some important factors, it provided a first strong indication that partial drainage of spent fuel pools can suppress circulation of air and therefore inhibit the cooling of the fuel. Thompson 1999 Report at D-7 – D-8.

Ten years later, in NUREG-1353, the NRC Staff examined the potential for a fire in fuel recently discharged from a reactor, and concluded that a fire would occur if the pool were completely emptied. *See* Thompson 2000 Report at 44-45, J.A. __. The study did not address fire risks for aged fuel, however; nor did it evaluate a partial drainage condition. ***Id.*** Nevertheless, the NRC Staff concluded that there was a need for further analysis of the risks of spent fuel pool storage, for two reasons:

> First, spent fuel is being stored instead of reprocessed. This has led to the expansion of onsite fuel storage by means of high density storage racks, which results in a larger inventory of fission products in the pool, a greater heat load on the pool cooling system, and less distance between adjacent fuel assemblies. Second, some laboratory studies have provided evidence of the possibility of fire propagation between assemblies in an air cooled environment. *Together, these two reasons provide the basis for an accident scenario which was not previously considered.*

NUREG-1353 at ES-1 (emphasis added). In spite of this recommendation and the indications of the 1979 Sandia Study, however, the NRC did not revisit the 1979 GEIS.

In 1999, the NRC Staff decided to evaluate whether it was reasonable to relax emergency

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fuel is considered to be aged when one or more years have elapsed since its discharge.

planning requirements for nuclear power plants that had ceased to operate and were in the process of decommissioning. Recognizing that the predominant source of risk remaining at permanently shutdown plants involves spent fuel storage pool accidents, the NRC undertook a study of pool storage risks, and issued a draft report on February 22, 1999. *Draft Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants* ("Draft Technical Study"). Dr. Thompson, a nuclear safety expert hired by Orange County to evaluate the risks of the Harris spent fuel pool expansion proposal, submitted comments charging that the Draft Technical Study was deficient. In particular, he charged that the Draft Technical Study assumed instantaneous and complete pool drainage, and did not address the more severe condition posed by partial drainage of a spent fuel pool. Letter from Gordon Thompson to Richard F. Dudley re: Spent Fuel Pool Accidents (September 30, 1999). In support of his comments, Dr. Thompson enclosed the February 1999 report he had prepared for Orange County, and which was submitted several months later in support of Orange County's contentions. The report cited the 1979 Sandia study, and also provided Dr. Thompson's own detailed technical analysis of the risks of partial drainage accidents. Thompson 1999 Report, Appendix D.[8] Once again, the NRC failed to revisit the GEIS in light of the significant new information provided by Dr. Thompson.

D. Harris License Amendment Proceeding

1. CP&L's proposal to expand Harris spent fuel pool storage capacity

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8 The NRC Staff later conceded the correctness of Dr. Thompson's analysis in the final version of the study. *Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants* (October 2000). (While the report is dated October 2000, it was not publicly released until January of 2001). The Technical Study confirmed that once the pool water level drops far enough to expose the fuel assemblies, fuel of any age must be assumed to burn.

The Harris nuclear plant was originally designed to have four units, with four reactors and four pools for storage of spent fuel. However, only one reactor unit was built and licensed in 1983. Although CP&L built all four storage pools, only pools A and B were fully equipped and licensed. Pools A and B are licensed for storage of 3,669 assemblies in high-density racks. The pools are used to store spent fuel from Harris, as well as spent fuel from two other CP&L plants, Brunswick and Robinson.

The license amendment that is the subject of this appeal permits CP&L to put pools C and D into service, for storage of an additional 4,715 fuel assemblies from Harris, Brunswick and Robinson. The storage racks permitted by the license amendment have an even higher density than the racks in pools A and B.[9] The amendment increases the total spent fuel storage capacity of the Harris plant to 8,343 assemblies, over a thousand more assemblies than were assumed in the original EIS that was prepared in support of the Harris operating license in 1983.[10]

2. NRC License Amendment Proceeding

The NRC license amendment proceeding for the proposed expansion of spent fuel storage at Harris began in early 1999, when the NRC Staff published a notice of the proposed license amendment and opportunity to request a hearing. Carolina Power & Light; Notice of Consideration of Issuance of Amendment to Facility Operating License, Proposed No Significant Hazards Determination, and Opportunity for a Hearing, 64 Fed. Reg. 2,237, 2,239-10 (January

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9 The permissible center-to-center distance between pressurized water reactor ("PWR") fuel assemblies in pools A and B is 10.5 inches. For pools C and D, the permissible distance between PWR assemblies is 9 inches.

10 *See* Harris 1983 EIS. The license application discussed in the 1983 EIS called for storage of up to 7,640 assemblies in the pools. *See* CP&L License Amendment Application, Enclosure 5 at 2 (December 23, 1998).

13, 1999), J.A. ___.[11] Orange County filed and was granted a hearing request. *Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), LBP-99-25, 50 NRC 25 (1999).[12]

On December 15, 1999, the NRC Staff issued an Environmental Assessment ("EA"), which concluded that the proposed expansion of spent fuel storage capacity of Harris would not pose a significant impact on the human environment requiring preparation of an EIS, due to the "negligible" potential for a spent fuel pool accident. Environmental Assessment and Finding of No Significant Impact Related to Expanding the Spent Fuel Pool Storage Capacity at the Shearon Harris Nuclear Power Plant (TAC No. MA4432) at 6, J.A __.

a. Orange County's Contention EC-6

Orange County filed a set of contentions challenging the Staff's refusal to prepare an EIS. Orange County's Request for Late-Filed Admission of Environmental Contentions (January 31, 2000) ("Environmental Contentions"), J.A. __. The contentions were supported by Dr. Thompson's February 1999 Report, J.A. __.

The County's first contention (later numbered "EC-6" by the ASLB) charged in relevant part as follows:

> [T]he proposed expansion of spent fuel pool storage capacity at Harris would create accident risks that are significantly in excess of the risks identified in the EA, and significantly in excess of accident risks previously evaluated by the NRC Staff in the EIS for the Harris operating license. These accident risks would significantly affect the quality of the human environment, and therefore must be addressed in an EIS.
>
> There are two respects in which the proposed license amendment would significantly increase the risk of an accident at Harris:
>
> (1) CP&L proposes several substantial changes in the physical characteristics and

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11 The Federal Register notice included a proposed determination of no significant hazards considerations, which is discussed below in Section ___.

12 After a Subpart K proceeding on two technical contentions, the ASLB dismissed these contentions on the merits in LBP-00-12, 51 NRC 247 (2000).

> mode of operation of the Harris plant. The effects of these changes on the accident risk posed by the Harris plant have not been accounted for in the Staff's EA. The changes would significantly increase, above present levels, the probability and consequences of potential accidents at the Harris plant.
>
> (2) During the period since the publication in 1979 of NUREG-0575, the NRC's Generic Environmental Impact Statement ("GEIS") on spent fuel storage, new information has become available regarding the risks of storing spent fuel in pools. This information shows that the proposed license amendment would significantly increase the probability and consequences of potential accidents at the Harris plant, above the levels indicated in the GEIS, the 1983 EIS for the Harris operating license, and the EA. The new information is not addressed in the EA or the 1983 EIS for the Harris operating license.
>
> Accordingly, the Staff must prepare an EIS that fully considers the environmental impacts of the proposed license amendment, including its effects on the probability and consequences of accidents at the Harris plant. As required by NEPA and Commission policy, the EIS should also examine the costs and benefits of the proposed action in comparison to various alternatives, including Severe Accident Mitigation Design Alternatives ("SAMDAs") and the alternative of dry storage.

Id., J.A. ___. The contention was supported by a lengthy and detailed statement of its basis, which also referenced Dr. Thompson's report. In the statement of basis, Orange County pointed out the inadequacies in the EA and the underlying GEIS:

> New information, developed after the publication of the GEIS, shows that total or partial loss of water from a fuel pool containing high-density racks can initiate an exothermic reaction of fuel cladding, either an air-zirconium reaction or a steam-zirconium reaction. Once initiated, this reaction could spread to nearby, previously uninvolved, fuel assemblies. A significant fraction of the pool's inventory of radioactive isotopes, notably cesium-137, could be released to the atmosphere and would then travel downwind as a plume, causing extensive land contamination. The new information also shows that total or partial loss of water from a fuel pool is not a remote or speculative event. For example, a degraded-core accident at the Harris reactor, with containment failure or bypass, would almost certainly lead to interruption of cooling of the Harris fuel pools, followed by loss of water from the pools through evaporation. Restoration of cooling water or makeup of water lost by evaporation would be precluded because onsite radiation levels would prevent access by personnel. [footnote omitted]
>
> The new information is summarized in a report by Dr. Gordon Thompson, entitled "Risks and Alternative Options Associated With Spent Fuel Storage at the Shearon Harris Nuclear Power Plant" (February 1999). A copy is attached as Exhibit 2. Dr. Thompson's report summarizes the state of knowledge about fuel pool accidents involving water loss

> and exothermic reaction of cladding, both generically and in the context of the Harris plant. The report shows that an accident of this type at the Harris plant could contaminate land with cesium-137 to the extent that relocation of populations could be required over an area as large as North Carolina.
>
> The NRC Staff's EA does not reflect the present state of knowledge about potential accidents in high-density fuel pools. The EA focuses on structural failure of a fuel pool, leading to total loss of water. EA at 5-6. In support of its limited discussion of that limited issue, the EA cites four NRC reports: NUREG/CR-4982, Severe Accidents in Spent Fuel Pools in Support of Generic Issue 82; NUREG/CR-5176, Seismic Failure and Cask Drop Analysis of the Spent Fuel Pools at Two Representative Nuclear Power Plants; NUREG/CR-5281, Value/Impact Analysis of Accident Preventative and Mitigative Options for Spent Fuel Pools; and NUREG-1353, Regulatory Analysis for the Resolution of Generic Issue 82: Beyond Design Basis Accidents in Spent Fuel Pools. EA at 5-6. The present state of knowledge about fuel pool accidents, however, is not confined to that accident scenario or the four reports cited by the NRC Staff. For example, as Dr. Thompson shows in his report, drawing upon other literature and his own analyses, the loss of water from the Harris fuel pools is an almost certain outcome of a degraded-core accident, with containment failure or bypass, at the Harris reactor. See Thompson Report, Appendix C. The EA does not address this matter. In addition, Dr. Thompson's report draws upon other literature and his own analyses to show that partial loss of water from a pool can be a more severe accident condition than total loss of water. See Thompson Report, Appendix D. The EA does not address this issue either. Thus, the EA incorrectly carries forward elements of the outdated understanding of pool accident risk that is reflected in the GEIS.

Id. at 8-10, J.A. __. In addition, Dr. Thompson's report listed a range of events, most not considered by the NRC Staff in the EA, that could lead to partial or complete uncovering of fuel in the Harris pools:

> (a) an earthquake, cask drop, aircraft crash, human error, equipment failure or sabotage event that leads to direct leakage from the pools;
> (b) siphoning of water from the pools through accident or malice;
> (c) interruption of pool cooling, leading to pool boiling and loss of water by evaporation; and
> (d) loss of water from active pools into adjacent pools or canals that have been gated off and drained.

Thompson 1999 Report at C-1, J.A. _.

In further support of its contention that a severe pool accident is "not a remote and speculative event," Orange County set forth a scenario, never before considered by the NRC, by

which a pool fire would be an almost certain outcome of a degraded-core reactor accident with containment failure or bypass. Environmental Contentions at 11-12, J.A. __; Thompson 1999 Report, Section 4, J.A. __[13]

As Orange County pointed out, a degraded-core reactor accident with containment failure or bypass is recognized as a credible event by the NRC for the purpose of evaluating the environmental impacts in EISs, as well as requiring emergency planning for the ten-mile-radius Emergency Planning Zones around nuclear plants. *Id.* at 11. Thus, it would set the "lower bound" of the probability of a pool fire. *Id.*

b. Admission of Contention EC-6

In LBP-00-19, the ASLB admitted the contention, *but only* "as it relates to" the specific sequence postulated by Orange County. The ASLB summarized the sequence as follows:

> 1) a degraded core accident;
> 2) containment failure or bypass;
> 3) loss of all spent fuel cooling and makeup systems;
> 4) extreme radiation doses precluding personnel access;
> 5) inability to restart any pool cooling or makeup systems due to extreme radiation doses;
> 6) loss of most or all pool water through evaporation; and
> 7) initiation of an exothermic oxidation reaction in pools C and D.

52 NRC at 95.[14] The ASLB applied the procedures of Subpart K to establish an expedited schedule that included 60 days for discovery, and required the submission of legal and

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13 To summarize, Orange County presented a scenario in which a degraded-core accident is accompanied by a simultaneous loss of spent fuel pool cooling functions, and radioactive material is able to escape the containment. Radiation is deposited on the reactor site, making it impossible for personnel to restore cooling functions. Manual functions for restoring water to the fuel pools are also rendered infeasible by high radiation levels on the site. The reactor site remains contaminated for a lengthy period, allowing water to evaporate from the pools to the tops of the fuel assemblies. At that point, a catastrophic fire ensues that envelops all four fuel pools.

14 The ASLB's wording of the accident sequence was based on a summary proposed by CP&L and agreed to with minor rewording by Orange County. Applicant's Response to

evidentiary summaries within 30 days after the close of discovery. 52 NRC at 100. An oral argument was scheduled for two weeks after the filing of written presentations. *Id.*

Following the brief discovery period, the parties filed written presentations. Orange County filed an extensive legal brief and a detailed expert report by Dr. Thompson.[15] Dr. Thompson began by laying out in detail the elements of an analysis that would provide an estimate of the probability of a pool fire, including the parameters that must be examined and the use of PRA to evaluate them. *See* Thompson 2000 Report, Section 3.1, J.A. __. He emphasized that in the brief time allowed for preparation of testimony under the NRC's rules for expedited proceedings, no party could possibly perform such a sophisticated analysis. *Id.* at 23, J.A. __. Dr. Thompson also provided an extensive discussion of the strengths and limitations of probabilistic risk assessment, the methodology used to quantify the probability and consequences of nuclear accident. *Id.*, Section 2.3, J.A. ___. Dr. Thompson stated his professional opinion, supported by the PRA literature, that, while PRA techniques provide the best available methodology for estimating the overall probability of the seven-part event sequence that has been identified by the ASLB, they have significant limitations and therefore must be used carefully. Thompson 2000 Report at 17, J.A. __. As Dr. Thompson testified, these limitations would affect the quality of any "best estimate" of the overall probability of the seven-part accident scenario, as

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BOCO's Late-Filed Environmental Contentions at 9-10 (March 3, 2000); Orange County's Reply to Applicant's and Staff's Oppositions to Request for Admission of Late-Filed Environmental Contentions at 8 (March 13, 2000), J.A. __.

15 *See* Detailed Summary of Facts, Data, and Arguments and Sworn Submission on which Orange County Intends to Rely at Oral Argument to Demonstrate the Existence of a Genuine and Substantial Dispute with the Licensee Regarding the Proposed Expansion of Spent Fuel Storage Capacity at the Harris Nuclear Power Plant with Respect to the Need to Prepare an Environmental Impact Statement to Address the Increased Risk of a Spent Fuel Pool Accident (November 20, 2000) (hereinafter "Detailed Summary"), J.A. ___; Declaration of Dr. Gordon Thompson (November 20, 2000), J.A. ___; Thompson 2000 Report, J.A. __.

requested by the ALSB. *Id.*

Despite the limitations on the detail of a study that could be performed in the time permitted by the ASLB for preparation of evidence, Dr. Thompson's report provided a methodical analysis of each step of the seven-step accident scenario posed by the ASLB. *Id.*, Section 4, J.A. __; and Appendices C-H, J.A. __. For each step, he described his factual assumptions and the source of his data, his analytical method in approaching the question of the probability of the event, and his estimate of the probability of that step in the chain of events.

In conclusion, Dr. Thompson provided a minimum value of a best estimate of the probability of a Harris pool fire, in the range of 0.2×10^{-5} to 1.2×10^{-4} per year, with a point estimate of 1.6×10^{-5} per year. Thompson 2000 Report, Table 5. This probability is comparable to industry and NRC estimates of the probability of a severe reactor accident, which is generally addressed in an EIS. Environmental Contentions at 11-12.

The NRC Staff and CP&L also filed legal and evidentiary presentations, arguing that the probability of a severe spent fuel pool accident is too small to warrant consideration in an EIS. The Staff provided a probability estimate of 10^{-7} per year, and CP&L provided a probability estimate of 10^{-8}. 53 NRC at 266-67. For the earlier steps of the analysis, the Staff and CP&L relied to a significant extent on pre-existing PRAs. For Step four and beyond, the NRC Staff's analysis primarily consisted of a set of qualitative judgments, supplemented by limited quantitative calculations, while CP&L claimed to perform a new PRA.

An oral argument was held on December 7, 2000. Pursuant to 10 C.F.R. § 2.1113(b), only counsel, and not experts, were permitted to participate. In the oral argument, counsel for Orange County pointed out significant deficiencies in the evidence presented by the Staff and the NRC, such that it could not be relied on by the ASLB in support of any decision to forego

preparation of an EIS, and that a further hearing was required.

E. Decisions Below

On March 1, 2001, the ASLB issued LBP-01-09, which denied Orange County a full evidentiary hearing on Contention EC-6 and found that the Staff had met its burden of showing that no EIS was required. 53 NRC at 271, J.A. __. Therefore, the ASLB terminated the proceeding. *Id.* The decision went through each of the seven accident steps the parties had been asked to address, and compared the evidence presented by the three parties. The decision included the following table comparing the parties' probability estimates:

BCOC Contention EC-6 Accident Scenario Cumulative Probability (S_N)				
Sequence Event ($_N$)		**BCOC (S_N)**	**CP&L (S_N)**	**Staff (S_N)**
1	Degraded core accident	3.1E-05		1.2E-04
2	Containment failure or bypass	1.6E-05	7.7E-06[a]	
3	Loss of SFP Cooling and/or Makeup Loss	1.6E-05		6.3E-06[c]
4	Radiation Dose Precludes Access	1.6E-05		
5	Inability to restart SFP cooling	1.6E-05		2.0E-07[d]
6	Loss of part or all of SFP water by evaporation	1.6E-05	2.7E-08[b]	2.0E-07
7	Initiation of exothermic oxidation reaction in Pools C and D	1.6E-05	2.7E-08	2.0E-07
Overall Sequence Probability (per reactor year)		**1.6E-05**	**2.7E-08**	**2.0E-07**

[a]CP&L combined its analysis of the first two steps.
[b]CP&L combined its analysis of steps three through six.
[c]Staff combined its analysis of steps two and three.
[d]Staff combined its analysis of steps four and five.

53 NRC at 267. For each of the seven steps, the ASLB ruled that Orange County had not met the NRC's standard for proceeding to an evidentiary hearing. 53 NRC at 253-66. The ASLB credited the NRC Staff's testimony on the probability of each of the accident steps, accepted the NRC Staff's estimates that the probability of the seven-step accident is "conservatively in the range of" 2.0 x 10^{-7} per year, and found that this level of probability falls within the realm of "remote and speculative" events not cognizable under NEPA. LBP-01-09, 53 NRC at 268. The ASLB also found that CP&L's "PRA-enhanced anlaysis" was "a beneficial, although not

dispositive, confirmation of the validity of the Staff's analysis to the degree the CP&L analysis yielded a probability estimate that was equal to or lower than the Staff's estimate." 53 NRC at 252.

On March 16, 2001, Orange County petitioned the NRC Commissioners for review of LBP-01-09 and LBP-01-19.[16] The Commission denied the petition for review in CLI-01-11, finding that the ASLB had "carefully" weighed the evidence presented by the parties and resolved their factual disputes, and had made "intricate and well-supported findings." *Id.*, 53 NRC at 387-89. The Commission affirmed the ASLB's conclusion that the Staff's accident probability estimate of 10^{-7} per year showed that the accident is "remote and speculative," but declined to rule on the question of whether, if it had accepted Orange County's evidence, a probability estimate of 10^{-5} per year requires preparation of an EIS. *Id.*, 53 NRC at 387-88 and n. 8.

F. Proceeding Regarding Determination of No Significant Hazards Considerations.

In the hearing notice that was issued on January 13, 1999 at 64 Fed. Reg. 2,237 [J.A. __], the NRC also commenced a separate proceeding for the making of a determination of No Significant Hazards Considerations. The hearing notice included a proposed NSH Determination. *Id.* The Staff concluded that the proposed license amendment would not involve any of the considerations set forth in 10 C.F.R. § 50.92(c)(1)-(3), and therefore proposed to issue the amendment before the conclusion of any hearing that might be held.

Orange County filed comments regarding the proposed determination, arguing, *inter alia,* that the proposed license amendment did not satisfy the standard for a no significant hazards

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16 Orange County's Petition for Review of LBP-00-12, LBP-00-19, and LBP-01-09 (March 16,

considerations determination, because it creates "the possibility of a new or different kind of accident from any accident previously evaluated." Orange County's Comments in Opposition to No Significant Hazards Determination and Conditional Request for a Stay of Effectiveness (February 12, 1999) (hereinafter "NSH Comments"), J.A. __. As Orange County pointed out, the NRC had performed no site-specific evaluation of the probability or consequences of severe accidents at pools A and B at Harris, such that the NRC could claim that the possibility of a spent fuel accident had ever been evaluated at all. *Id.* at 6. Moreover, Orange County argued that the proposed expansion of spent fuel storage at Harris decreased the margin of safety, thereby precluding a finding of no significant hazards considerations. *Id.* at 7-8.

For almost two years, the NRC took no further action on the proposed NSH Determination. On December 21, 2000, the NRC issued a notice of its final NSH Determination, J.A. __. The notice did not respond to, or even mention, the comments that Orange County had submitted. Moreover, it failed to address the fact that at the time the decision was being issued, Orange County's environmental contention was pending before the ASLB.

On December 22, 2000, Orange County filed a petition for review and a stay motion with the NRC Commissioners. Orange County's Petition for Review and Request for Immediate Suspension and Stay of the NRC Staff's No Significant Hazards Determination, J.A. ___. The Commission neither declined nor accepted review. Instead, it ordered the NRC Staff to submit a brief addressing the Commission's no significant hazards criteria and the "severe accident question," including "a summary of any quantitative data that underlie the Staff's NSHC determinations on accident probability, accident consequences, and margins of safety." CLI-01-07, 53 NRC at 199. On February 28, 2001, the NRC Staff filed NRC Staff Brief in Response to

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2001), J.A. __.

Commission Order of February 14, 2001. Shortly thereafter, on March 1, 2001, the ASLB issued LBP-01-09. In CLI-01-11, the Commission ruled that the issuance of LBP-01-09 had rendered the validity of the NSH Determination "inconsequential for this adjudication." 53 NRC at 381 n.1.

VI. SUMMARY OF ARGUMENT

In the Subpart K proceeding regarding the proposed expansion of spent fuel storage capacity at the Harris nuclear power plant, the NRC violated NEPA by denying Orange County a complete hearing on all of the relevant environmental considerations it had raised, regarding the risk of a catastrophic accident in the Harris spent fuel pools. Orange County satisfied the Commission's requirements for the admission of its contention, by demonstrating with expert testimony and documentary support, new information regarding the risks of spent fuel pool accidents. This new information demonstrated that key assumptions undergirding the NRC's previous environmental analyses, on which it relied for its refusal to prepare an EIS in this case, were invalid; and that as a result, the NRC must revisit the potential for a wide range of accidents in spent fuel pools.

Moreover, in the limited evidentiary presentation that was conducted regarding a single accident scenario, the ASLB and the Commission systematically shifted the burden of proof from the NRC Staff to Orange County. They accomplished this shift in two ways. First, they penalized Orange County for not performing the analysis that the Staff should have done, rather than requiring the Staff's testimony to stand on its own. Second, the ASLB failed to acknowledge that Orange County relied to a significant extent on technical studies prepared by the NRC Staff itself. The ASLB failed to require the NRC Staff to reconcile the inconsistencies between the Staff's technical studies and its testimony in this proceeding. Instead, it treated

information and opinions presented in NRC Staff technical reports as the unsupported opinion of Orange County's expert, and rejected it on that basis.

The ASLB's decision regarding the credibility of the single accident scenario is also arbitrary and capricious, because it relies on an assumption that is fundamentally inconsistent with NEPA. The ASLB accepted the Staff's low probability calculation for the accident scenario, based in part on the Staff's assumption that workers would be exposed to hazardous radiation doses in order to restore makeup water to the pools and thereby prevent an accident from progressing to the point of a fire and radiological release. While it may be acceptable for workers to incur high radiation doses in order to save lives during a real accident, it is not consistent with NEPA to assume environmental harm to workers, when the sole purpose of that assumption is to depress the estimate of the accident's probability and thereby avoid preparation of an EIS. If hazardous impacts to workers are relied on as a means for avoiding the accident, those impacts must be discussed in an EIS.

The ASLB's decision that the accident scenario was too improbable to require an EIS was also arbitrary and capricious because it relied on the adequacy of alleged calculations by CP&L that were never placed in the record, and therefore could not be assumed to exist.

The NRC's NSH Determination was also arbitrary and capricious, violated the NRC's own regulations, and was inconsistent with NEPA. Although the NRC was required to solicit public comments on the determination before making it final, it never responded to Orange County's comments that the NSH Determination was unjustified. Moreover, the NRC failed to adhere to its own regulations, which precluded the issuance of a NSH Determination if the proposed license amendment created even the possibility of a new or different kind of accident from any accident previously evaluated. The ASLB's decision to admit for litigation the

credibility of the accident scenario posed by Orange County established, as a matter of law, the possibility of such a new or different kind of accident, and therefore precluded the issuance of the NSH Determination. Finally, the NRC violated NEPA by issuing the license amendment before the completion of the agency's inquiry into whether the amendment must be supported by the prior issuance of an EIS.

VII. ARGUMENT

A. Standard of Review

An agency's failure to follow its own regulations must be reversed as arbitrary decisionmaking. *Sierra Club v. NRC,* 862 F.2d 222, 229 (9th Cir. 1988). In applying the arbitrary and capricious standard to factually-based decisions by agencies, the Supreme Court has also held that the agency must "examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made." *Burlington Truck Lines, Inc. v. United States,* 371 U.S. 156, 168 (1962).

In reviewing NEPA-related decisions, "courts must determine that this decision accords with traditional norms of reasoned decisionmaking and that agency has taken the 'hard look' required by NEPA." *Foundation on Economic Trends v. Heckler,* 756 F.2d 143, 151 (D.C. Cir. 1985). Moreover,

> The decision not to prepare an EIS can only be overturned if the decision was arbitrary, capricious, or an abuse of discretion. Judicial review of an agency's finding of 'no significant impact' is not, however, merely perfunctory, as the court must insure that the agency took a 'hard look' at the environmental consequences of its decision.

Sierra Club v. Peterson, 717 F.2d 1409, 1413 (D.C. Cir. 1983). Failure to address a "major environmental concern" is fatal to a determination of no significant impact. *Foundation on Economic Trends v. Heckler,* 756 F.2d at 154.

B. The NRC Violated Its Own Regulations and NEPA By Refusing to Consider Orange County's Entire Contention Which Raised Specific New Information About Spent Fuel Pool Fires.

In LBP-00-19, the ASLB admitted only that portion of Contention EC-6 that related to the seven-part accident scenario for a degraded-core accident with containment bypass. 52 NRC at 95. The ASLB did not admit, or even mention, the other portions of the contention which charged that the EA was insufficient to address the overall probability of a spent fuel pool accident. Environmental Contention at 9-11, J.A. __. In CLI-01-11, the Commission defended the ASLB's decision, on the ground that Orange County had offered "no specific causes for spent fuel pool accidents other than the seven-step scenario admitted by the Board," and therefore could not "transform vague references to potential spent fuel pool catastrophes into litigable contentions."[17] 53 NRC at 390, *citing Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 333-35 (1999). The ASLB's failure to admit the entire contention constituted error in two respects.

First, Orange County's contention completely satisfied the Commission's own promulgated standards for admissibility of contentions. Pursuant to 10 C.F.R. § 2.714(b), contentions must be presented with basis and specificity. Postulating a specific accident scenario is not the only legitimate way to meet this standard. A petitioner may also "allege some specific deficiency in the environmental analysis." *Pacific Gas & Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-86-12, 24 NRC 1, 12, *rev'd on other ground sub nom. San Luis*

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17 As further grounds for affirming the ASLB, the Commission also stated that Orange County "expressly approved the final language of its admitted environmental contention," and therefore could not be heard to complain that some part of it had not been admitted. CLI-01-11, 53 NRC at 390. The assertion is incorrect. While Orange County approved CP&L's summary of the steps in the seven-part accident scenario, *see* discussion, *supra,* at note 14, this was only a part of the contention. In no respect did Orange County give its approval to the ASLB's decision

Obispo Mothers for Peace v. NRC, 799 F.2d 1268 (9th Cir. 1986). *See also Township of Lower Alloways Creek v. NRC,* 687 F.2d 723, 746 (3rd Cir. 1982) . In addition, expert opinion and documentary evidence can provide the necessary support for admissibility of a contention. 10 C.F.R. § 2.714(b)(2)(ii). The contention specifically criticized the EA for focusing on accidents involving a total loss of spent fuel pool water. Environmental Contentions at 9-10. It also asserted that the GEIS, on which the EA relies, is outdated and does not reflect new information showing that the risks and consequences of spent fuel pool accidents are higher than previously believed. Moreover, Dr. Thompson's supporting report provided a comprehensive and detailed discussion of the strengths and weaknesses in the current literature regarding spent fuel accident risks. Thompson 1999 Report, *passim.* He also provided scoping calculations regarding the potential for a pool fire under partial drainage conditions. *Id.* at D-3 – D-5, J.A. __. These calculations showed, among other things, that if residual water is present in a pool, thus blocking convective circulation of air or steam, even fuel aged ten years or more would burn. *Id.* Thus, the extensive evidence presented in the contention and Dr. Thompson's report was more than sufficient to demonstrate a material factual dispute regarding the adequacy of the GEIS and the EA to support the NRC's refusal to prepare an EIS in this case.

Second, the ASLB's failure to admit the contention in its entirety violated the NRC's NEPA obligation to consider and evaluate new information and "make a reasoned determination" about its significance to the human environment. *Warm Springs Dam Task Force v. Gribble,* 621 F.2d at 1023-1024. Two fundamental assumptions of the GEIS and EA were shown to be defective by the new information discussed in Orange County's contention. Given that these assumptions were no longer valid, the very underpinnings for the original EIS for the Harris plant

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to ignore a major portion of its contention.

were no longer valid, and the NRC was obligated to look anew at the potential impacts on the environment of spent fuel pool accidents.

C. In Ruling on the Merits of the Admitted Portion of Contention EC-6, the ASLB Unlawfully Shifted the Burden of Proof to Orange County.

As the ASLB ruled in LBP-01-09, the Staff had the burden of proof in the Subpart K proceeding:

> Once [Orange County] crossed the admissibility threshold relative to its accident sequence contention, the ultimate burden in this Subpart K proceeding then rested with the proponent of the NEPA document – the Staff and the Applicant to the degree it becomes a proponent of the Staff's EIS-related action – to establish the validity of that determination on the question whether the accident sequence is an EIS-preparation trigger.

53 NRC at 249. Thus, the NRC Staff had an independent obligation to prove that the seven-part accident scenario that was admitted to the proceeding was remote and speculative. In violation of this requirement, the ASLB and the Commission shifted the burden of proof to Orange County throughout the Subpart K proceeding, and failed to require the Staff to make a defensible decision that no further hearing was required, or that no EIS need be prepared for the Harris license amendment.

1. The Commission and the ASLB shifted the burden of preparing a comprehensive analysis to Orange County.

Instead of holding the Staff to its burden of proof, the Commission and the ASLB repeatedly declared that the Staff had prevailed by virtue of Orange County's perceived failure to prove the Staff wrong. The burden of proof belonged to the Staff, not Orange County.

a. CLI-01-11

One of the Commission's principal grounds for denying review in CLI-01-11 was that Dr. Thompson did not, himself, undertake the comprehensive analysis that he testified was required in order to justify the Staff's refusal to prepare an EIS. 53 NRC at 388. The Commission declared a hearing futile, because "Orange County apparently intends merely to reiterate its critique of the probabilistic risk assessment of others (the NRC Staff and CP&L), but not to offer a fresh analysis of its own." 53 NRC at 389. Thus, the Commission unlawfully imposed on Orange County, as a condition to obtaining a full evidentiary hearing, the burden of establishing that the accident scenario was not remote and speculative by means of a PRA.[18]

b. LBP-01-09, Event 4

For Event 4, it was necessary to predict the likelihood that in the aftermath of a degraded core accident with containment bypass, workers would be unable to re-enter the site for the purpose of restoring water to the spent fuel pools. The prediction required a calculation of the onsite radiation levels that would exist as a result of a release from the containment.

The ASLB shifted the burden of proof from the NRC Staff to Orange County with respect to Event 4, by faulting Orange County for using a scoping calculation rather than attempting to perform "detailed calculations of expected radiation fields" at various locations on the site. 53 NRC at 260. The ASLB criticized Orange County's scoping calculation as

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18 It is noteworthy that the Commission did not impose the same burden on the NRC Staff. Both the Commission and the ASLB accepted the Staff's analysis as sufficient, even though it fell considerably short of constituting a PRA. CLI-01-11, 53 NRC at 387; LBP-01-09, 53 NRC at 252. Both the Commission and the ASLB failed to address or refute in any way Dr. Thompson's expert opinion that a PRA was necessary for assessing the probability of the accident, insofar as it could be estimated.

"unreasonably conservative" and lacking in "scientific basis," because it failed to "account for building and equipment configuration, historical meteorological data, and accident scenarios." *Id.* The ASLB completely ignored Dr. Thompson's testimony that the constraints of the proceeding and the limitations on available methodologies did not permit a comprehensive or sufficient analysis by *any* party, including the NRC Staff. Thompson 2000 Report at 23. Instead, the ASLB accepted the Staff's analysis as "credible," without confronting Dr. Thompson's testimony regarding the difficulties of performing a reliable analysis. 53 NRC at 260, 256 note 5. *See also* discussion in Section C.2.c, *infra.*

Thus, the ASLB faulted Orange County for not performing the comprehensive analysis that it should have required of the NRC Staff. The County was not required to prove the Staff's error by doing the Staff's job of performing its own probabilistic calculations.

2. The ASLB failed to require the Staff to justify its failure to adhere to the conclusions presented in the Staff's own technical reports.

Throughout his report, Dr. Thompson consistently relied on studies prepared by or for the NRC for his probability estimates for the seven-step accident scenario. In crediting the NRC Staff's testimony, the ASLB repeatedly failed to recognize that the NRC Staff itself was a principal source for Orange County's evidence. Thus, instead of correctly identifying a conflict between NRC Staff members that implicated the Staff's ability to meet its burden of proof, the ASLB ascribed the conflicting view to Orange County and dismissed it as unworthy of consideration.

a. LBP-01-09, Event 2

(i) Containment bypass

For Event 2, it was necessary to predict the likelihood that following a degraded core accident, radiation would escape the containment via a breach in or bypass of the containment. 53 NRC at 254. Relying exclusively on a single NRC Staff study, Orange County examined the likelihood of one particular mode of containment bypass, temperature-induced steam generator tube rupture (TI-SGTR), and reported a conditional likelihood of 50% that it would occur. Thompson 2000 Report at 26-28, citing NUREG-1570, *Risk Assessment of Severe Accident-Induced Steam Generator Tube Rupture* (March 1998) (hereinafter "NUREG-1570").

The ASLB rejected this piece of evidence as "far too simplistic," because Orange County allegedly had not considered "recent procedural changes adopted by CP&L not to run reactor coolant pumps after a severe accident," or linked a variety of containment failure or bypass modes with specific degraded-core sequences. 53 NRC at 255-56. In reaching its conclusion, the ASLB completely sidestepped the fact that the evidence relied on by Dr. Thompson was the NRC Staff's own study, which Dr. Thompson had not modified or qualified in any way. Thompson 2000 Report at 26-28. NUREG-1570 did, in fact, consider the relevant details of accident scenarios, equipment configurations and plant operating procedures. *Id.* Moreover, NUREG-1570 did not rely on any assumption that reactor coolant pumps would operate during a degraded-core sequence. *See* Transcript of December 7, 2000, oral argument at 472-74 (hereinafter "Arg. Tr."), J.A. __. The ASLB failed to hold the NRC Staff to its burden of proving that its own study was inadequate to support a conditional probability estimate of 50% for Event 2.

(ii) Transport mechanism

Event 2 also required a prediction of the form and transport mechanism by which radioactive material could escape the containment. Dr. Thompson predicted that the high-burnup fuel used at Harris would be subject to fragmentation and powdering, which will increase the volume of radioactive material released to the environmental during an accident. Thompson 2000 Report at 28-29 and Appendix D, J.A. __. Dr. Thompson also testified that the presence of fragmented and powdered fuel in the release would promote onsite deposition, and that these effects could be supplemented by hard-to-model phenomena such as aerosol agglomeration and plume rainout. *Id.* For these predictions, Dr. Thompson relied on several studies, including a report by the NRC Staff, NUREG-1465, *Accident Source Terms for Light-Water Nuclear Power Plants* (February 1995) (hereinafter "NUREG-1465").

The ASLB completely ignored Orange County's reliance on NUREG-1465. This study could not provide more explicit support for Orange County's position:

> Recent information has indicated that high burnup fuel, that is, fuel irradiated at levels in excess of about 40 GWD/MTU, may be more prone to failure during design basis reactivity insertion accidents than previously thought. *Preliminary indications are that high burnup fuel also may be in a highly fragmented or powdered form, so that failure of the cladding could result in a significant fraction of the fuel itself being released.*

NUREG-1465 at 14 (emphasis added). The study provided prima facie evidence that the Staff's testimony in the Subpart K proceeding had not come to terms with the Staff's own scientific research. By failing to address this internal conflict within the NRC Staff, the ASLB failed to hold the Staff to its burden of proof.[19]

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19 Moreover, the ASLB gave no reason, nor is there any apparent reason, for its bald assertion that another study relied on by Dr. Thompson, Franz Schmitz and Joelle Papin, *High burnup effects on fuel behavior under accident conditions: the tests CABRI REP-Na 270*, Journal of Nuclear Materials 55 (1999) (hereinafter "Schmitz and Papin study"), is not

b. LBP-01-09, Event 3

Event 3 required a prediction of the likelihood that spent fuel pool cooling functions and the ability to provide makeup water would be lost. With respect to Event 3, the ASLB asserted that, "[t]e Board is seriously troubled by BCOC's [Orange County's] claim of certainty -- its use of a probability of one -- that there will be a loss of SFP cooling as a result of a degraded core accident and containment failure." 53 NRC at 257. *See also* 53 NRC at 253 (all of the degraded core sequences identified by Orange County "lead finally to a loss of cooling to the fuel pools"). Nowhere in Dr. Thompson's report did he state that a loss of pool cooling will *result* from a degraded core accident and containment failure. To the contrary, for each of the four degraded core scenarios evaluated by Dr. Thompson, he stated that "the spent fuel pool cooling system would become inoperative at the beginning of the sequence." Thompson 2000 Report at 29. Dr. Thompson did not reach this conclusion as a matter of his own professional judgment, but took it straight out of a Probabilistic Safety Analysis performed by CP&L. *Id.* at C-1 - C-2, J.A. __. In LBP-01-09, the ASLB specifically approved of CP&L's and the Staff's reliance on CP&L's previously conducted probabilistic safety assessments for the Harris plant. 53 NRC at 252, 253-54. Yet, when Orange County relied on one of these studies, the Board claimed it was "seriously troubled." 53 NRC at 257. By denying Orange County the right to rely for its own purposes on the very same evidence the ASLB had approved as supportive of CP&L's and the Staff's case, the ASLB shifted the burden of proof to Orange County.[20]

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representative of the circumstances at Shearon Harris." 53 NRC at 256, n. 5. Orange County cited the Schmitz and Papin study for the report's general observation that high-burnup fuel can be highly fragmented. Thompson 2000 Report at D-3. On its face, the observation is applicable to Harris, which uses high-burnup fuel. The ASLB was not entitled to deny the study's relevance without providing some explanation.

20 The ASLB also claims that Orange County "seemingly ignores the fundamental

c. LBP-01-09, Event 4

Orange County presented evidence that the NRC Staff's method for calculating onsite radiation doses was insufficient because it relied on the ARCON computer code to predict the behavior of the radioactive plume that escapes the containment. As Dr. Thompson explained, ARCON is a straight-line Gaussian model. *See* Thompson 2000 Report at D-4, J.A. __ , citing *NUREG/CR-6331, Atmospheric Relative Concentrations in Building Wakes* (1997) (hereinafter "NUREG/CR-6331"). As such, he opined, it "can shed little light" on building wake effects.[21] *Id.* Dr. Thompson also testified that by themselves, such building wake effects could lead to significant onsite deposition of radioactive material.

As discussed above in Section C.1.b, the ASLB unlawfully shifted the burden of proof to Orange County by faulting it for not having done a more sophisticated analysis than a scoping study. In addition, the ASLB casually dismissed Orange County's criticism of the Staff's reliance on the ARCON model, without acknowledging that it was the Staff's own document which describe the ARCON model as a straight-line Gaussian model. 53 NRC at 256, n. 5.[22]

The basic diffusion model implemented in the ARCON 96 code is a straight-line Gaussian

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benefits of engineered safety principles, such as physical separation, redundancy, and diversity in connection with equipment necessary for SFP cooling." 53 NRC at 257. This assertion ignores the fundamental nature of severe accidents, which is that they involve events that are not anticipated by the application of engineered safety principles to the design of nuclear power plant safety systems. This is why they are commonly referred to as "beyond design basis accidents."

21 Wake effects are plume behaviors that, while difficult to model, are easily observable to the layperson. For example, one observes that an automobile with a comparatively flat rear surface tends to accumulate dirt on its rear windows. Also, a pedestrian in a city with high-rise buildings often observes irregular wind patterns at street level.

22 In CLI-01-11, the Commission attempted to cure the ASLB's error by claiming that the ARCON model "is conservative, takes into account site-specific meteorological conditions, and considers building wake effects to a limited degree." 53 NRC at 388 note 9. This assertion begs the question raised by Dr. Thompson, which is whether ARCON, as a straight-line Gaussian model, is adequate to model the complex three-dimensional conditions posed by building wakes in the context of the postulated accident.

> *model* that assumes the release rate is constant for the entire period of release. This assumption is made to permit evaluation of potential effects of accidental releases without having to specify a complete release sequence.

NUREG/CR-6331 at 41, J.A. ___ (emphasis added). Thus, once again, the ASLB shifted the burden of proof to Orange County, by ignoring the fact that the source of Orange County's information was the NRC Staff itself.

d. LBP-01-09, Event 6

For Event 6, it was necessary to predict the likelihood that water lost from the pool due to evaporation could not be restored in time to prevent a spent fuel fire. 53 NRC at 264. Relying on evidence presented by the NRC Staff, the ASLB found that there are "myriad ways" to provide makeup water to fuel pools, and that Orange County had not "adequately accounted for them." In fact, the number of available makeup options identified by both CP&L and the NRC Staff is a finite number: nine. *See* Affidavit of Gareth W. Parry, Stephen F. LaVie, Robert L. Palla and Christopher Gratton In Support of NRC Staff Brief, Etc. at 115-16 (November 17, 2001); Thompson Report at 37-38.

Dr. Thompson's Report addressed the reliability of all nine of these options. *Id.* As he testified, there is a high degree of dependency among these makeup options. He pointed out that all six of the proceduralized options would rely on electrical power, although two of those options would allow a limited and insufficient inventory of water to enter the pools by gravity. Two of the three nonproceduralized options would also rely on electrical power. As Dr. Thompson testified, electric power must be assumed to be unavailable in the aftermath of the accident, and thus these makeup options would not be available. Only one option -- a single diesel fire pump -- would not rely on electrical power. Equally significant, every one of the nine makeup options would rely upon a functioning command structure. *Id.* In the high radiation

environment following a degraded core accident with containment bypass, the control room and its backup Technical Support Center would be nonfunctional for a period considerably exceeding seven days. *Id.*

The ASLB did not address the adequacy of the Staff's analysis in light of these criticisms, or identify any additional makeup functions that Dr. Thompson allegedly failed to address. By failing to hold the NRC Staff to its burden of proof, the ASLB effectively shifted it to Orange County.

D. The ASLB's Decision Regarding The Likelihood Of The Single Seven-Step Accident Violated NEPA and Was Arbitrary and Capricious.

1. The ASLB Unlawfully Assumed Harm to Workers, for the Sole Purpose of Depressing the Staff's Accident Probability Estimate.

As discussed above, in Section V.C, NEPA requires the evaluation of all significant environmental impacts in an EIS. In violation of this fundamental principle, the ASLB unlawfully found that the exposure of Harris workers to radiation doses in excess of federal safety limits could be assumed for the purpose of avoiding the preparation of an EIS.

Event 5 required a prediction of whether workers would be unable to restart cooling or makeup systems due to extreme radiation doses. This part of the analysis built upon Step 4, by determining the doses to which workers would be exposed, given radiation levels on the site and the time it would take to perform restorative functions. Orange County introduced evidence that doses would be in excess of 5 rem, the maximum permissible occupational dose allowed in one year of normal operation by 10 C.F.R. § 20.1201(a)(1). Thompson Report, Sections 4.4 and 4.5, J.A. __.

The Staff predicted that workers would be able to gain access to the site in order to perform their tasks, but based this prediction on the assumption that the workers would be

allowed to receive a radiation dose of up to 25 rem during the incident. 53 NRC at 262. A one-time 25 rem dose is considered acceptable by the U.S. Environmental Protection Agency in emergencies, "for life saving and protection of large populations." LBP-01-09, 53 NRC at 263, citing U.S. EPA, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (October 1991) ("hereinafter EPA PAGs").[23] The ASLB found for the NRC Staff. 53 NRC at 263.

The ASLB based its decision on an assumption that is fundamentally inconsistent with NEPA. In order to come up with a very low probability calculation for a spent fuel pool fire, the NRC Staff assumed that workers would incur doses above regulatory limits for occupational doses, in order to stop the accident from progressing to the point of a pool fire. *See* LBP-01-09, 53 NRC at 262-63. Thus, the NRC Staff's low probability calculation for Step 5 is based in significant part on the Staff's assumption that workers may be exposed to environmental harm, *i.e.,* radiation doses above normal occupational limits. Had the Staff not made this assumption, its probability calculation would have been higher, and may have been found sufficiently high to warrant the preparation of an EIS. The NRC may not avoid the preparation of an EIS that discusses one type of significant environmental harm, on the basis of an assumption that another type of significant environmental harm is acceptable. Such an assumption violates the fundamental principles of NEPA that require the protection of the environment through detailed disclosure of any significant environmental harm that may be caused by major federal actions.

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23 The EPA recommends the use of a 5 rem per year "upper bound" for worker exposures during a radiological emergency. *Id.* at 2-10. In addition, the EPA recommends that doses be kept "as low as reasonably achievable," i.e., even lower than 5 rems per year, as is consistent with the regulation of normal occupational exposures. *Id.* The EPA's guidance makes it clear that doses above 10 rems Total Effective Dose Equivalent ("TEDE") per year are only justified by the protection of "valuable property," and doses up to 25 rems TEDE per year are

See Robertson v. Methow Valley, 490 U.S. at 349 (NEPA's goal of protecting environment served through maximum disclosure of significant adverse environmental impacts).

The ASLB also mischaracterized Orange County's argument, by asserting that Orange County's argument turned on the alleged *unwillingness* of workers to incur high radiation doses in an accident. *Id.* The psychological response of a worker in the face of a nuclear accident is not remotely relevant to Orange County's position. The question that Orange County raised to the ASLB was whether it was lawful for the NRC Staff to assume that workers would incur radiation doses in excess of occupational exposure limits in the course of restoring water to spent fuel pools, *for the sole purposes of depressing accident probability estimates and thereby avoiding the preparation of an EIS. See* Detailed Summary at 31-38. NEPA mandates that the answer to this question is a resounding "no." Because they may have a significant adverse impact on human health, radiation exposures to workers that are above normal occupational limits constitute significant adverse impacts that must be considered in an EIS.

2. The ASLB's decision was arbitrary and capricious because it relied on nonexistent calculations.

In LBP-01-09 the ASLB declared that the Staff's conclusion with respect to the extremely low probability of Step 5 was "supported by CP&L's detailed evaluation." 53 NRC at 263. In summarizing CP&L's evidentiary presentation regarding Step 5, the ASLB also uncritically asserted that CP&L expert Benjamin Morgan "calculated accessibility to in-plant areas," and that "Mr. Morgan indicated the results of these calculations show that various areas of the plant to which access would be necessary after the postulated accident would be reachable to perform activities to provide SFP cooling or makeup." 53 NRC at 261. These conclusions

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only justified "for life saving activities and the protection of large populations." *Id.* at 2-11.

with respect to the adequacy of CP&L's calculations for Event 5 apply by implication to Event 4, because the dose calculations in Step 5 are based on the radiation level calculations in Step 4.

The record is devoid of any factual basis for the ASLB's confidence in CP&L's analysis. As the ASLB was well aware, CP&L did not submit a single calculation or piece of data regarding either the levels of radiation that would be experienced at the Harris site in the aftermath of a degraded core accident with containment bypass (step 4), or the radiation doses that workers would receive (step 5). This was pointed out by Orange County's attorney during the oral argument, and confirmed by CP&L's attorney. *See* Arg. Tr. at 476, 596. The only information submitted by CP&L consisted of Mr. Morgan's unsupported and conclusory assertions that doses would be acceptable. Thus, for purposes of the Supart K proceeding, no calculations existed on which the ASLB could have relied for support of the NRC Staff's position with respect to Step 5.[24] Moreover, the ASLB had no factual basis for reporting that CP&L had performed "calculations of radiation levels" at Step 4, a necessary predicate to completing Step 5. *See* 53 NRC at 259.

Not once did the ASLB mention the fact that CP&L failed to submit any data that would support CP&L's generalized assertions regarding the probability of Events 4 and 5. Instead, the ASLB reported that CP&L had performed "calculations," thus giving the distinct impression that

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24 The ASLB attempted to buttress the credibility of CP&L's analysis by claiming that it was subjected to a "peer review-type process." 53 NRC at 268-69. *See also* CLI-01-11, 53 NRC at 389 ("Notably, as the Board stressed, the NRC Staff and CP&L subjected their analytical work to peer review.") NRC procedural guidelines for PRA preparation, however, require that a PRA must provide sufficient information so that its calculations can be reproduced by an independent reviewer. *See* Arg. Tr. at 471, 686-87. Peer review of CP&L's analysis for Steps 4 and 5 was impossible here, because no data was provided. *Id.* Moreover, the alleged peer review was performed by employees of the same company that prepared the PRA, and CP&L provided no information that the reviewers had not participated in the preparation of the PRA itself. Arg. Tr. at 687-89.

such calculations existed. The ASLB also generalized about CP&L's "PRA-enhanced analysis" as "beneficial, although not dispositive, confirmation of the validity of the Staff's analysis to the degree the CP&L analysis yielded a probability estimate that was equal to or lower than the Staff's estimate." 53 NRC at 252.

Steps 4 and 5 of the accident scenario, regarding the onsite radiation levels and doses that workers might experience if they try to restore water to the fuel pools, are complex steps in the accident analysis that involve significant controversy between Orange County and the NRC Staff. To state that CP&L performed calculations that supported the Staff, without ever having seen a single calculation, constituted the height of capricious decisionmaking. Moreover, if permitted to stand uncorrected, such misleading claims about the adequacy of an environmental analysis "can defeat the first function of an EIS by impairing the agency's consideration of the adverse environmental effects of a proposed project." *Hughes River Watershed Conservancy v. Glickman,* 81 F.3d 437, 446 (4th Cir. 1996) (rejecting EIS that contained misleading projects of a project's economic benefits). *See also South Louisiana Environmental Council, Inc. v. Sand,* 629 F.2d 1005, 1011-12 (5th Cir. 1980); *Johnston v. Davis,* 698 F.2d 1088, 1094-95 (10th Cir. 1983).

E. The NRCs Determination Of No Significant Hazards Considerations Was Arbitrary And Capricious And Violated NEPA.

1. The NSH Determination is invalid because it failed to respond to comments by Orange County.

As discussed above in Section V.A.2, a proposed determination of no significant hazards considerations must be published for comment in the Federal Register before it can be made final. As the U.S. Court of Appeals has recognized, the opportunity to comment on a proposed agency decision is "meaningless unless the agency responds to significant points raised by the

public." *St. James Hospital v. Heckler,* 760 F.2d 1460, 1470 (7th Cir.), *cert. denied,* 474 U.S. 902 (1985), *quoting Home Box Office v. FCC,* 566 F.2d 9, 35-36 (D.C. Cir.), *cert. denied,* 434 U.S. 829 (1977). In its final determination of no significant hazards considerations, the NRC Staff did not even mention Orange County's comments, let alone respond to them. On this basis alone, the decision is arbitrary and capricious and must be reversed.

2. The NSH Determination violated NRC's own regulations.

In making a NSH Determination, the NRC must follow its own regulations. *San Luis Obispo Mothers for Peace v. NRC*, 799 F.2d 1268 (9th Cir. 1986). The NRC's NSH regulations preclude the making of a NSH Determination if there is a "possibility" of a new or different kind of accident that has not been considered before. 10 C.F.R. § 50.92(c)(2).

At the time that the Staff issued the final NSH Determination, Orange County's environmental contention was pending before the ASLB. By admitting the contention in LBP-00-19, the ASLB had established, as a matter of law, the potential for a credible accident scenario, never before considered by the NRC, that could cause a severe accident at the Harris nuclear power plant. Unless and until the ASLB determined that this potential was not, in fact, credible, the NRC was bound by it. In effect, LBP-00-19 established, as a matter of law, that a NSH Determination could not be issued due to the "possibility" of a new kind of accident that had never before been considered. *San Luis Obispo Mothers for Peace v. U.S. NRC*, 799 F.2d at 1271 (finding that NRC's own statements conceding the possibility of a new and different kind of action precluded issuance of No Significant Hazards Consideration, regardless of NRC's conclusion that the accident was unlikely). Thus, the NSH Determination must be reversed.

3. The NSH Determination violated NEPA.

It is a cardinal principle of NEPA that the environmental consequences of a proposed federal action must be considered *before* it goes forward, not afterwards. *Robertson v. Methow, supra,* 490 U.S. at 349. At the time the staff issued the NSHC determination, the ASLB was in the course of considering whether the proposed Harris license amendment posed a foreseeable risk of a severe pool accident, such that an EIS should be prepared. Thus, the question of whether the proposed amendment would require an EIS was still open. It was patently illegal for the NRC Staff to issue a license amendment to CP&L before this determination had been made.

F. If The Court Reverses LBP-00-19 And/Or LBP-01-09, The NSH Determination Will Be Ripe For Review.[25]

As the NRC has acknowledged, if Orange County prevails in its appeal, the validity of the NSH Determation will "regain significance." Federal Respondents' Opposition to Petitioner's Motion to Reactivate and Consolidate and Motion to Dismiss or Alternatively, to Continue in Abeyance at 7 (July 23, 2001) (hereinafter "NRC Motion"). However, the agency maintains that the NSHC Determination is not ripe. The NRC bases this argument on the fact that, although the NRC Commissioners denied Orange County's petition for review, they left open the possibility that they might take review of the No Significant Hazards Determination on their own initiative and reverse it. *Id.* at 6-7. Contrary to the Commission's argument, this case meets the judicial test of ripeness.

As this Court has held, "[r]ipeness depends on 'the fitness of the issues for judicial decision and the hardship to the parties of withholding court consideration." *Burlington Northern R. Co. v. Surface Transportation Board,* 75 F.3d 685, 691 (D.C. Cir. 1996), *quoting*

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25 In an October 22, 2001, order consolidating Nos. 01-1073 and 01-1246, the Court

Abbot Laboratories v. Gardner, 387 U.S. 136, 149 (1967). This case meets both prongs of the test. [26]

The courts typically find cases fit for judicial review where "[p]urely legal" questions are involved. In addition, the courts examine whether the agency's policy has "crystallized," or whether "there may be some other material institutional advantage from deferring review." *Id.* As discussed above in Section E, the primary issue here is legal: whether a decision by the ASLB precluded, as a matter of law, the issuance of a NSH Determination. Moreover, the agency decisionmaking process "crystallized" with the issuance of the NSH Determination. The decision became immediately effective and final upon issuance. 10 C.F.R. § 50.58(b)(6). The regulations provided no right of administrative appeal or even the opportunity for a petition for review, and review by the Commissioners was completely discretionary. *Id.* While the Commission subsequently speculated in CLI-01-07 that it *might* undertake review of the decision, it never made a commitment to do so, nor did it act on the additional information that it requested from the NRC Staff in CLI-01-07. The Court should not withhold review based on mere speculation that the decision might change in the future. *See Appalachian Power Co. v EPA,* 208 F.3d 1015, 1023 (D.C. Cir. 2000) ("The fact that a law may be altered in the future has

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directed the parties to address issues presented in motions to dismiss No. 01-1073.

26 *New York State Electric & Gas Corp. v. FERC,* 177 F.3d 1037, 1040 (D.C. Cir. 1999); and *DRG Funding Corp. v. HUD,* 76 F.3d 1212, 1215 (D.C. Cir. 1996), do not support the NRC's argument. NRC Motion at 7. In *New York State,* the Court found that an appeal of a FERC decision establishing a legal presumption was unripe because the presumption had not yet been applied by the agency in any administrative proceeding; in fact, no such proceeding had even been requested. 177 F.2d at 1040. In contrast, in this case, the administrative action, issuance of the CP&L license amendment before completion of the hearing, has already "come to pass." *Id.* No further action is necessary to put it into effect. *DRG Funding Corp.* is simply inapplicable, because it concerns the question of finality rather than ripeness. The NRC has not contested the finality of the NSH Determination as an immediately effective decision by the Commission.

nothing to do with whether it is subject to judicial review.")

Moreover, to withhold review until some unspecified time in the future when the NRC decides whether or not to take review of the No Significant Hazards Determination would impose a hardship on Orange County. The immediate and unjustified issuance of the operating license amendment to CP&L caused an injury to Orange County by allowing CP&L to make dangerous changes to the plant's operation before completion of the adjudicatory proceeding on the safety and environmental risks of the amendment. Orange County has no redress for that injury other than its recourse to this Court.

VIII. CONCLUSION AND REQUEST FOR RELIEF

For the foregoing reasons, Orange County requests the Court to reverse and remand LBP-00-19, LBP-01-09, and the NRC Staff's NSH Determination. The Court should hold that the NRC failed to satisfy its burden of proving that no EIS was required in this case, and order the agency to prepare an EIS. In the alternative, the Court should order the hearing to be reopened and to proceed to a trial.

Respectfully submitted,

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March 27, 2002

ADDENDUM

PERTINENT STATUTES AND REGULATIONS

Statutes

Atomic Energy Act, 42 U.S.C. § 2239(a)(1)
(hearing provision and Sholly Amendment) ADD-1

National Environmental Policy Act, 42 U.S.C. 4332 ..... ADD-3

Nuclear Waste Policy Act, 42 U.S.C. § 10154 ..... ADD-5

Regulations

10 C.F.R. § 2.714(b) ADD-7

10 C.F.R. Part 2, Subpart K ADD-8

10 C.F.R. § 20.1201(a)(1) ADD-10

10 C.F.R. § 50.58(b)(6) ADD-11

10 C.F.R. § 50.92(c) ADD-12

40 C.F.R. § 1502.22(b)(1) ADD-13

ATOMIC ENERGY ACT AND SHOLLY AMENDMENT, 42 U.S.C. § 2239(a)

Section 2239. Hearings and judicial review

(a)(1)(A) In any proceeding under this chapter, for the granting, suspending, revoking, or amending of any license or construction permit, or application to transfer control, and in any proceeding for the issuance or modification of rules and regulations dealing with the activities of licensees, and in any proceeding for the payment of compensation, an award or royalties under sections (FOOTNOTE 1) 2183, 2187, 2236(c) or 2238 of this title, the Commission shall grant a hearing upon the request of any person whose interest may be affected by the proceeding, and shall admit any such person as a party to such proceeding. The Commission shall hold a hearing after thirty days' notice and publication once in the Federal Register, on each application under section 2133 or 2134(b) of this title for a construction permit for a facility, and on any application under section 2134(c) of this title for a construction permit for a testing facility. In cases where such a construction permit has been issued following the holding of such a hearing, the Commission may, in the absence of a request therefor by any person whose interest may be affected, issue an operating license or an amendment to a construction permit or an amendment to an operating license without a hearing, but upon thirty days' notice and publication once in the Federal Register of its intent to do so. The Commission may dispense with such thirty days' notice and publication with respect to any application for an amendment to a construction permit or an amendment to an operating license upon a determination by the Commission that the amendment involves no significant hazards consideration.

(FOOTNOTE 1) So in original. Probably should be "section".

(B)(i) Not less than 180 days before the date scheduled for initial loading of fuel into a plant by a licensee that has been issued a combined construction permit and operating license under section 2235(b) of this title, the Commission shall publish in the Federal Register notice of intended operation. That notice shall provide that any person whose interest may be affected by operation of the plant, may within 60 days request the Commission to hold a hearing on whether the facility as constructed complies, or on completion will comply, with the acceptance criteria of the license.

(ii) A request for hearing under clause (i) shall show, prima facie, that one or more of the acceptance criteria in the combined license have not been, or will not be met, and the specific operational consequences of nonconformance that would be contrary to providing reasonable assurance of adequate protection of the public health and safety.

(iii) After receiving a request for a hearing under clause (i), the Commission expeditiously shall either deny or grant the request. If the request is granted, the Commission shall determine, after considering petitioners' prima facie showing and any answers thereto, whether during a period of interim operation, there will be reasonable assurance of adequate protection of the public health and safety. If the Commission determines that there is such reasonable assurance, it shall allow operation during an

interim period under the combined license.

(iv) The Commission, in its discretion, shall determine appropriate hearing procedures, whether informal or formal adjudicatory, for any hearing under clause (i), and shall state its reasons therefor.

(v) The Commission shall, to the maximum possible extent, render a decision on issues raised by the hearing request within 180 days of the publication of the notice provided by clause (i) or the anticipated date for initial loading of fuel into the reactor, whichever is later. Commencement of operation under a combined license is not subject to subparagraph (A).

(2)(A) The Commission may issue and make immediately effective any amendment to an operating license or any amendment to a combined construction and operating license, upon a determination by the Commission that such amendment involves no significant hazards consideration, notwithstanding the pendency before the Commission of a request for a hearing from any person. Such amendment may be issued and made immediately effective in advance of the holding and completion of any required hearing. In determining under this section whether such amendment involves no significant hazards consideration, the Commission shall consult with the State in which the facility involved is located. In all other respects such amendment shall meet the requirements of this chapter.

(B) The Commission shall periodically (but not less frequently than once every thirty days) publish notice of any amendments issued, or proposed to be issued, as provided in subparagraph (A). Each such notice shall include all amendments issued, or proposed to be issued, since the date of publication of the last such periodic notice. Such notice shall, with respect to each amendment or proposed amendment (i) identify the facility involved; and (ii) provide a brief description of such amendment. Nothing in this subsection shall be construed to delay the effective date of any amendment.

(C) The Commission shall, during the ninety-day period following the effective date of this paragraph, promulgate regulations establishing (i) standards for determining whether any amendment to an operating license or any amendment to a combined construction and operating license involves no significant hazards consideration; (ii) criteria for providing or, in emergency situations, dispensing with prior notice and reasonable opportunity for public comment on any such determination, which criteria shall take into account the exigency of the need for the amendment involved; and (iii) procedures for consultation on any such determination with the State in which the facility involved is located.

NATIONAL ENVIRONMENTAL POLICY ACT, 42 U.S.C. §§ 4321 and 4332

Section 4321. Congressional declaration of purpose

The purposes of this chapter are: To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.

Section 4332. Cooperation of agencies; reports; availability of information; recommendations; international and national coordination of efforts

The Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this chapter, and (2) all agencies of the Federal Government shall -

(A) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment;

(B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by subchapter II of this chapter, which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations;

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on -

(i) the environmental impact of the proposed action,

(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,

(iii) alternatives to the proposed action,

(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public as provided by section 552 of title 5, and

shall accompany the proposal through the existing agency review processes;

(D) Any detailed statement required under subparagraph (C) after January 1, 1970, for any major Federal action funded under a program of grants to States shall not be deemed to be legally insufficient solely by reason of having been prepared by a State agency or official, if:

(i) the State agency or official has statewide jurisdiction and has the responsibility for such action,

(ii) the responsible Federal official furnishes guidance and participates in such preparation,

(iii) the responsible Federal official independently evaluates such statement prior to its approval and adoption, and

(iv) after January 1, 1976, the responsible Federal official provides early notification to, and solicits the views of, any other State or any Federal land management entity of any action or any alternative thereto which may have significant impacts upon such State or affected Federal land management entity and, if there is any disagreement on such impacts, prepares a written assessment of such impacts and views for incorporation into such detailed statement.

The procedures in this subparagraph shall not relieve the Federal official of his responsibilities for the scope, objectivity, and content of the entire statement or of any other responsibility under this chapter; and further, this subparagraph does not affect the legal sufficiency of statements prepared by State agencies with less than statewide jurisdiction. (FOOTNOTE 1)

(FOOTNOTE 1) So in original. The period probably should be a semicolon.

(E) study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources;

(F) recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment;

(G) make available to States, counties, municipalities, institutions, and individuals, advice and information useful in restoring, maintaining, and enhancing the quality of the environment;

(H) initiate and utilize ecological information in the planning and development of resource-oriented projects; and

(I) assist the Council on Environmental Quality established by subchapter II of this chapter.

NUCLEAR WASTE POLICY ACT, 42 U.S.C. §§ 10152 AND 10154

Section 10152. Available capacity for interim storage of Spent nuclear fuel

The Secretary, the Commission, and other authorized Federal officials shall each take such actions as such official considers necessary to encourage and expedite the effective use of available storage, and necessary additional storage, at the site of each civilian nuclear power reactor consistent with -

(1) the protection of the public health and safety, and the environment;

(2) economic considerations;

(3) continued operation of such reactor;

(4) any applicable provisions of law; and

(5) the views of the population surrounding such reactor.

Section 10154. Licensing of facility expansions and transshipments

a) Oral argument

In any Commission hearing under section 189 of the Atomic Energy Act of 1954 (42 U.S.C. 2239) on an application for a license, or for an amendment to an existing license, filed after January 7, 1983, to expand the spent nuclear fuel storage capacity at the site of a civilian nuclear power reactor, through the use of high-density fuel storage racks, fuel rod compaction, the transshipment of spent nuclear fuel to another civilian nuclear power reactor within the same utility system, the construction of additional spent nuclear fuel pool capacity or dry storage capacity, or by other means, the Commission shall, at the request of any party, provide an opportunity for oral argument with respect to any matter which the Commission determines to be in controversy among the parties. The oral argument shall be preceded by such discovery procedures as the rules of the Commission shall provide. The Commission shall require each party, including the Commission staff, to submit in written form, at the time of the oral argument, a summary of the facts, data, and arguments upon which such party proposes to rely that are known at such time to such party. Only facts and data in the form of sworn testimony or written submission may be relied upon by the parties during oral argument. Of the materials that may be submitted by the parties during oral argument, the Commission shall only consider those facts and data that are submitted in the form of sworn testimony or written submission.

(b) Adjudicatory hearing

(1) At the conclusion of any oral argument under subsection (a) of this section, the Commission shall designate any disputed question of fact, together with any remaining questions of law, for resolution in an adjudicatory hearing only if it determines that -

(A) there is a genuine and substantial dispute of fact which can only be resolved with sufficient accuracy by the introduction of evidence in an adjudicatory hearing; and

(B) the decision of the Commission is likely to depend in whole or in part on the resolution of such dispute.

(2) In making a determination under this subsection, the Commission -

(A) shall designate in writing the specific facts that are in genuine and substantial dispute, the reason why the decision of the agency is likely to depend on the resolution of such facts, and the reason why an adjudicatory hearing is likely to resolve the dispute; and

(B) shall not consider -

(i) any issue relating to the design, construction, or operation of any civilian nuclear power reactor already licensed to operate at such site, or any civilian nuclear power reactor for which a construction permit has been granted at such site, unless the Commission determines that any such issue substantially affects the design, construction, or operation of the facility or activity for which such license application, authorization, or amendment is being considered; or

(ii) any siting or design issue fully considered and decided by the Commission in connection with the issuance of a construction permit or operating license for a civilian nuclear power reactor at such site, unless (I) such issue results from any revision of siting or design criteria by the Commission following such decision; and (II) the Commission determines that such issue substantially affects the design, construction, or operation of the facility or activity for which such license application, authorization, or amendment is being considered.

(3) The provisions of paragraph (2)(B) shall apply only with respect to licenses, authorizations, or amendments to licenses or authorizations, applied for under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) before December 31, 2005.

(4) The provisions of this section shall not apply to the first application for a license or license amendment received by the Commission to expand onsite spent fuel storage capacity by the use of a new technology not previously approved for use at any nuclear powerplant by the Commission.

(c) Judicial review

No court shall hold unlawful or set aside a decision of the Commission in any proceeding described in subsection (a) of this section because of a failure by the Commission to use a particular procedure pursuant to this section unless -

(1) an objection to the procedure used was presented to the Commission in a timely fashion or there are extraordinary circumstances that excuse the failure to present a timely objection; and

(2) the court finds that such failure has precluded a fair consideration and informed resolution of a significant issue of the proceeding taken as a whole.

54 FR 33168

(b)(1) Not later than fifteen (15) days prior to the holding of the special prehearing conference pursuant to § 2.751a, or if no special prehearing conference is held, fifteen (15) days prior to the holding of the first prehearing conference, the petitioner shall file a supplement to his or her petition to intervene that must include a list of the contentions which petitioner seeks to have litigated in the hearing. A petitioner who fails to file a supplement that satisfies the requirements of paragraph (b)(2) of this section with respect to at least one contention will not be permitted to participate as a party. Additional time for filing the supplement may be granted based upon a balancing of the factors in paragraph (a)(1) of this section.

(2) Each contention must consist of a specific statement of the issue of law or fact to be raised or controverted. In addition, the petitioner shall provide the following information with respect to each contention:

(i) A brief explanation of the bases of the contention.

(ii) A concise statement of the alleged facts or expert opinion which support the contention and on which the petitioner intends to rely in proving the contention at the hearing, together with references to those specific sources and documents of which the petitioner is aware and on which the petitioner intends to rely to establish those facts or expert opinion.

54 FR 33168

(iii) Sufficient information (which may include information pursuant to paragraphs (b)(2)(i) and (ii) of this section) to show that a genuine dispute exists with the applicant on a material issue of law or fact. This showing must include references to the specific portions of the application (including the applicant's environmental report and safety report) that the petitioner disputes and the supporting reasons for each dispute, or, if the petitioner believes that the application fails to contain information on a relevant matter as required by law, the identification of each failure and the supporting reasons for the petitioner's belief. On issues arising under the National Environmental Policy Act, the petitioner shall file contentions based on the applicant's environmental report. The petitioner can amend those contentions or file new contentions if there are data or conclusions in the NRC draft or final environmental impact statement, environmental assessment, or any supplements relating thereto, that differ significantly from the data or conclusions in the applicant's document.

Subpart K—Hybrid Hearing Procedures for Expansion of Spent Nuclear Fuel Storage Capacity at Civilian Nuclear Power Reactors

50 FR 41662

§ 2.1101 Purpose.

The regulations in this subpart establish hybrid hearing procedures, as authorized by section 134 of the Nuclear Waste Policy Act of 1982 (96 Stat. 2230), to be used at the request of any party in certain contested proceedings on applications for a license or license amendment to expand the spent nuclear fuel storage capacity at the site of a civilian nuclear power plant. These procedures are intended to encourage and expedite onsite expansion of spent nuclear fuel storage capacity.

63 FR 66721

§ 2.1103 Scope.

The procedures in this subpart apply to contested proceedings on applications filed after January 7, 1983, for a license or license amendment under Part 50 of this chapter, to expand the spent fuel storage capacity at the site of a civilian nuclear power plant, through the use of high density fuel storage racks, fuel rod compaction, the transshipment of spent nuclear fuel to another civilian nuclear power reactor within the same utility system, the construction of additional spent nuclear fuel pool capacity or dry storage capacity, or by other means. This subpart also applies to proceedings on applications for a license under Part 72 of this chapter to store spent nuclear fuel in an independent spent fuel storage installation located at the site of a civilian nuclear power reactor. This subpart shall not apply to the first application for a license or license amendment to expand the spent fuel storage capacity at a particular site through the use of a new technology not previously approved by the Commission for use at any other nuclear power plant. This subpart shall not apply to proceedings on applications for transfer of a license issued under Part 72 of this chapter. Subpart M of this part applies to license transfer proceedings.

50 FR 41662

§ 2.1105 Definitions.

As used in this part:

(a) "Civilian nuclear power reactor" means a civilian nuclear power plant required to be licensed as a utilization facility under section 103 or 104(b) of the Atomic Energy Act of 1954.

(b) "Spent nuclear fuel" means fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing.

§ 2.1107 Notice of proposed action.

In connection with each application filed after January 7, 1983, for a license or an amendment to a license to expand the spent nuclear fuel storage capacity at the site of a civilian nuclear power plant, for which the Commission has not found that a hearing is required in the public interest, for which an adjudicatory hearing has not yet been convened, and for which a notice of proposed action has not yet been published as of the effective date of this subpart, the Commission will, prior to acting thereon, cause to be published in the **Federal Register** a notice of proposed action in accordance with § 2.105. The notice of proposed action will identify the availability of the hybrid hearing procedures in this subpart, specify that any party may invoke these procedures by filing a timely request for oral argument under § 2.1109, and provide that if a request for oral argument is granted, any hearing held on the application shall be conducted in accordance with the procedures in this subpart.

§ 2.1109 Requests for oral argument.

(a)(1) Within ten (10) days after an order granting a request for hearing or petition for leave to intervene, any party may invoke the hybrid hearing procedures in this subpart by requesting an oral argument. Requests for oral argument shall be in writing and shall be filed with the presiding officer. The

presiding officer shall grant a timely request for oral argument.

(2) The presiding officer may grant an untimely request for oral argument only upon a showing of good cause by the requesting party for failure to file on time and after providing the other parties an opportunity to respond to the untimely request.

(b) The presiding officer shall issue a written order ruling on any requests for oral argument. If the presiding officer grants a request for oral argument, the order shall include a schedule for discovery and subsequent oral argument with respect to the admitted contentions.

(c) If no party to the proceeding requests oral argument, or if all untimely requests for oral argument are denied, the presiding officer shall conduct the proceeding in accordance with Subpart G of 10 CFR Part 2.

50 FR 41662

§ 2.1111 Discovery.

Discovery shall begin and end at such times as the presiding officer shall order. It is expected that all discovery shall be completed within 90 days. The presiding officer may extend the time for discovery upon good cause shown based on exceptional circumstances and after providing the other parties an opportunity to respond to the request.

§ 2.1113 Oral argument.

(a) Fifteen (15) days prior to the date set for oral argument, each party, including the NRC staff, shall submit to the presiding officer a detailed written summary of all the facts, data, and arguments which are known to the party at such time and on which the party proposes to rely at the oral argument either to support or to refute the existence of a genuine and substantial dispute of fact. Each party shall also submit all supporting facts and data in the form of sworn written testimony or other sworn written submission. Each party's written summary and supporting information shall be simultaneously served on all other parties to the proceeding.

(b) Only facts and data in the form of sworn written testimony or other sworn written submission may be relied on by the parties during oral argument, and the presiding officer shall consider those facts and data only if they are submitted in that form.

50 FR 41662

§ 2.1115 Designation of issues for adjudicatory hearing.

(a) After due consideration of the oral presentation and the written facts and data submitted by the parties and relied on at the oral argument , the presiding officer shall promptly by written order:

(1) Designate any disputed issues of fact, together with any remaining issues of law, for resolution in an adjudicatory hearing; and

(2) Dispose of any issues of law or fact not designated for resolution in an adjudicatory hearing.

With regard to each issue designated for resolution in an adjudicatory hearing, the presiding officer shall identify the specific facts that are in genuine and substantial dispute, the reason why the decision of the Commission is likely to depend on the resolution of that dispute, and the reason why an adjudicatory hearing is likely to resolve the dispute. With regard to issues not designated for resolution in an adjudicatory hearing, the presiding officer shall include a brief statement of the reasons for the disposition. If the presiding officer finds that there are no disputed issues of fact or law requiring resolution in an adjudicatory hearing, the presiding officer shall also dismiss the proceeding.

(b) No issue of law or fact shall be designated for resolution in an adjudicatory hearing unless the presiding officer determines that:

(1) There is a genuine and substantial dispute of fact which can only be resolved with sufficient accuracy by the introduction of evidence in an adjudicatory hearing; and

(2) The decision of the Commission is likely to depend in whole or in part on the resolution of that dispute.

(c) In making a determination under paragraph (b) of this section, the presiding officer shall not consider:

50 FR 41662

(1) Any issue relating to the design, construction, or operation of any civilian nuclear power reactor already licensed to operate at the site, or any civilian nuclear power reactor for which a construction permit has been granted at the site, unless the presiding officer determines that any such issue substantially affects the design, construction, or operation of the facility or activity for which a license application, authorization, or amendment to expand the spent nuclear fuel storage capacity is being considered; or

(2) Any siting or design issue fully considered and decided by the Commission in connection with the issuance of a construction permit or operating license for a civilian nuclear power reactor at that site, unless (i) such issue results from any revision of siting or design criteria by the Commission following such decision; and (ii) the presiding officer determines that such issue substantially affects the design, construction, or operation of the facility or activity for which a license application, authorization, or amendment to expand the spent nuclear fuel storage capacity is being considered.

(d) The provisions of paragraph (c) of this section shall apply only with respect to licenses, authorizations, or amendments to licenses or authorizations applied for under the Atomic Energy Act of 1954, as amended, before December 31, 2005.

(e) Unless the presiding officer disposes of all issues and dismisses the proceeding, appeals from the presiding officer's order disposing of issues and designating one or more issues for resolution in an adjudicatory hearing are interlocutory and must await the end of the proceeding.

§ 2.1117 Applicability of other sections.

In proceedings subject to this subpart, the provisions of Subparts A and G of 10 CFR Part 2 are also applicable, except where inconsistent with the provisions of this subpart.

Subpart C—Occupational Dose Limits

§ 20.1201 Occupational dose limits for adults.

(a) The licensee shall control the occupational dose to individual adults, except for planned special exposures under § 20.1206, to the following dose limits.

(1) An annual limit, which is the more limiting of—

(i) The total effective dose equivalent being equal to 5 rems (0.05 Sv); or

(ii) The sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to 50 rems (0.5 Sv).

(2) The annual limits to the lens of the eye, to the skin, and to the extremities, which are:

56 FR 23360

(i) A lens dose equivalent of 15 rems (0.15 Sv), and

63 FR 39477

(ii) A shallow-dose equivalent of 50 rems (0.50 Sv) to the skin or to any extremity.

(b) Doses received in excess of the annual limits, including doses received during accidents, emergencies, and planned special exposures, must be subtracted from the limits for planned special exposures that the individual may receive during the current year (see § 20.1206(e)(1)) and during the individual's lifetime (see § 20.1206(e)(2)).

56 FR 23360

(c) The assigned deep-dose equivalent and shallow-dose equivalent must be for the part of the body receiving the highest exposure. The deep-dose equivalent, lens dose equivalent, and shallow-dose equivalent may be assessed from surveys or other radiation measurements for the purpose of demonstrating compliance with the occupational dose limits, if the individual monitoring device was not in the region of highest potential exposure, or the results of individual monitoring are unavailable.

63 FR 39477

(d) Derived air concentration (DAC) and annual limit on intake (ALI) values are presented in table 1 of appendix B to part 20 and may be used to determine the individual's dose (see § 20.2106) and to demonstrate compliance with the occupational dose limits.

(e) In addition to the annual dose limits, the licensee shall limit the soluble uranium intake by an individual to 10 milligrams in a week in consideration of chemical toxicity (see footnote 3 of appendix B to part 20).

60 FR 20183

§ 50.58 Hearings and report of the Advisory Committee on Reactor Safeguards.

(a) Each application for a construction permit or an operating license for a facility which is of a type described in § 50.21(b) or § 50.22, or for a testing facility, shall be referred to the Advisory Committee on Reactor Safeguards for a review and report. An application for an amendment to such a construction permit or operating license may be referred to the Advisory Committee on Reactor Safeguards for review and report. Any report shall be made part of the record of the application and available to the public, except to the extent that security classification prevents disclosure.

39 FR 10554

(b)(1) The Commission will hold a hearing after at least 30-days' notice and publication once in the Federal Register on each application for a construction permit for a production or utilization facility which is of a type described in § 50.21(b) or § 50.22, or for a testing facility.

(2) When a construction permit has been issued for such a facility following the holding of a public hearing, and an application is made for an operating license or for an amendment to a construction permit or operating license, the Commission may hold a hearing after at least 30-days' notice and publication once in the Federal Register, or, in the absence of a request therefor by any person whose interest may be affected, may issue an operating license or an amendment to a construction permit or operating license without a hearing, upon 30-days' notice and publication once in the Federal Register of its intent to do so.

(3) If the Commission finds, in an emergency situation, as defined in § 50.91, that no significant hazards consideration is presented by an application for an amendment to an operating license, it may dispense with public notice and comment and may issue the amendment. If the Commission finds that exigent circumstances exist, as described in § 50.91, it may reduce the period provided for public notice and comment.

51 FR 7744

(4) Both in an emergency situation and in the case of exigent circumstances, the Commission will provide 30 days notice of opportunity for a hearing, though this notice may be published after issuance of the amendment if the Commission determines that no significant hazards consideration is involved.

(5) The Commission will use the standards in § 50.92 to determine whether a significant hazards consideration is presented by an amendment to an operating license for a facility of the type described in § 50.21(b) or § 50.22, or which is a testing facility, and may make the amendment immediately effective, notwithstanding the pendency before it of a request for a hearing from any person, in advance of the holding and completion of any required hearing, where it has determined that no significant hazards consideration is involved.

(6) No petition or other request for review of or hearing on the staff's significant hazards consideration determination will be entertained by the Commission. The staff's determination is final, subject only to the Commission's discretion, on its own initiative, to review the determination.

§ 50.92 Issuance of amendment.

(a) In determining whether an amendment to a license or construction permit will be issued to the applicant, the Commission will be guided by the considerations which govern the issuance of initial licenses or construction permits to the extent applicable and appropriate. If the application involves the material alteration of a licensed facility, a construction permit will be issued before the issuance of the amendment to the license. If the amendment involves a significant hazards consideration, the Commission will give notice of its proposed action (1) pursuant to § 2.105 of this chapter before acting thereon and (2) as soon as practicable after the application has been docketed.

(b) The Commission will be particularly sensitive to a license amendment request that involves irreversible consequences (such as one that permits a significant increase in the amount of effluents or radiation emitted by a nuclear power plant).

(c) The Commission may make a final determination, pursuant to the procedures in § 50.91, that a proposed amendment to an operating license for a facility licensed under § 50.21(b) or § 50.22 or for a testing facility involves no significant hazards consideration, if operation of the facility in accordance with the proposed amendment would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or

(2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or

(3) Involve a significant reduction in a margin of safety.

[51 FR 7767, Mar. 6, 1986]

§ 1502.22 Incomplete or unavailable information.

When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.

(a) If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.

(b) If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement:

(1) A statement that such information is incomplete or unavailable; (2) a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; (3) a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment, and (4) the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.

(c) The amended regulation will be applicable to all environmental impact statements for which a Notice of Intent (40 CFR 1508.22) is published in the FEDERAL REGISTER on or after May 27, 1986. For environmental impact statements in progress, agencies may choose to comply with the requirements of either the original or amended regulation.

[51 FR 15625, Apr. 25, 1986]

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

ORANGE COUNTY, NORTH CAROLINA, Petitioner, v. UNITED STATES NUCLEAR REGULATORY COMMISSION and the UNITED STATES OF AMERICA, Respondents CAROLINA POWER & LIGHT Intervenor-Respondents	Nos. 01-1073, 01-1246 (Consolidated)

CERTIFICATE OF SERVICE

I certify that on March 27, 2002, copies of the foregoing Initial Brief for Petitioner Orange County were served on the Court and on the following parties by first-class mail:

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CASE SCHEDULED FOR ORAL ARGUMENT SEPTEMBER 5, 2002

In the

United States Court of Appeals
For the District of Columbia Circuit

Nos. 01-1073 and 01-1246 (Consolidated)

ORANGE COUNTY, NORTH CAROLINA

Petitioner

v.

UNITED STATES NUCLEAR REGULATORY COMMISSION
And the UNITED STATES OF AMERICA,

Respondents

CAROLINA POWER & LIGHT COMPANY

Intervenor-Respondent

PETITION TO REVIEW A FINAL DECISION OF THE
U.S. NUCLEAR REGULATORY COMMISSION

INITIAL BRIEF FOR PETITIONER

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CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES

The undersigned, counsel of record for Petitioner Board of Commissioners of Orange County, North Carolina, certifies the following regarding parties, rulings, and related cases:

Parties and Amici: The parties to this case are Orange County (Petitioner), the U.S. Nuclear Regulatory Commission (Respondent), and the United States of America (co-Respondent). Carolina Power & Light Co. has been admitted as an intervenor-respondent. There are no amici.

Rulings Under Review: The rulings under review are: United States Nuclear Regulatory Commission, *Carolina Power & Light Company,* Docket No. 50-400, Notice of Issuance of Amendment to Facility Operating License and Final Determination of No Significant Hazards Consideration (December 21, 2001); *Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), LBP-00-19, 52 NRC 85 (2000); and *Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), LBP-01-09, 53 NRC 239

(2001). These decisions relate to the NRC's issuance of an operating license amendment to CP&L for expansion of spent fuel storage capacity at its Harris nuclear power plant.

Related Cases

There are no related cases, either previously or currently pending before this Court or any other court.

Respectfully submitted,

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March 27, 2002

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

ORANGE COUNTY, NORTH CAROLINA, Petitioner, v. UNITED STATES NUCLEAR REGULATORY COMMISSION and the UNITED STATES OF AMERICA, Respondents CAROLINA POWER & LIGHT Intervenor-Respondents	Nos. 01-1073, 01-1246 (Consolidated)

CERTIFICATE REQUIRED BY FRAP 32(A)(7)(C)
REGARDING WORD COUNT

The undersigned, counsel of record for Petitioner Board of Commissioners of Orange County, North Carolina, certifies that the number of words in the Initial Brief for Petitioner, excluding the Table of Contents, Table of Authorities, Glossary, Addendum, and certificates of counsel, is 13,656, as counted by the Microsoft Word program.

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March 27, 2002

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Glossary of Abbreviations and Acronyms

BWR	Boiling Water Reactor
CLI-01-07	*Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), CLI-01-07, 53 NRC 113 (2001)
CLI-01-11	*Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), CLI-01-11, 53 NRC 370 (2001)
CP&L	Carolina Power & Light Co.
Detailed Summary	Detailed Summary of Facts, Data, and Arguments and Sworn Submission on which Orange County Intends to Rely at Oral Argument to Demonstrate the Existence of a Genuine and Substantial Dispute with the Licensee Regarding the Proposed Expansion of Spent Fuel Storage Capacity at the Harris Nuclear Power Plant with Respect to the Need to Prepare an Environmental Impact Statement to Address the Increased Risk of a Spent Fuel Pool Accident (November 20, 2000)
Draft Technical Study	*Draft Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants*
EA	Environmental Assessment
EIS	Environmental Impact Statement
Environmental Contentions	Orange County's Request for Late-Filed Admission of Environmental Contentions (January 31, 2000)
EPA PAGs	U.S. EPA, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (October 1991)
FONSI	Finding of No Significant Impact
GEIS	Generic Environmental Impact Statement, NUREG-0575, Handling and Storage of Spent Light Water Power Reactor Fuel (1979)
Harris 1983 EIS	NUREG-0972, Final Environmental Statement Related to the Operation of Shearon Harris Nuclear Power Plant Units 1 and 2, Docket Nos. STN 50-400 and 50-401, Carolina Power and Light Company (October 1983)
LBP-00-19	*Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), LBP-00-19, 52 NRC 85 (2000)
LBP-01-09	*Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), LBP-01-09, 53 NRC 239 (2001)
NEPA	National Environmental Policy Act
NRC	U.S. Nuclear Regulatory Commission
NRC Motion	Federal Respondents' Opposition to Petitioner's Motion to Reactivate and Consolidate and Motion to Dismiss or Alternatively, to Continue in Abeyance at 7 (July 23, 2001)

NSH Comments	Orange County's Comments in Opposition to No Significant Hazards Determination and Conditional Request for a Stay of Effectiveness (February 12, 1999)
NSH Determination	No Significant Hazards Consideration
NUREG-1353	NUREG-1353, Regulatory Analysis for the Resolution of Generic Issue 82, Beyond Design Basis Accidents in Spent Fuel Pools" at ES-1 (1989)
NUREG-1465	NUREG-1465, *Accident Source Terms for Light-Water Nuclear Power Plants* (February 1995)
NUREG-1570	NUREG-1570, *Risk Assessment of Severe Accident-Induced Steam Generator Tube Rupture* (March 1998)
NUREG/CR-0649	*NUREG/CR-0649, Spent Fuel Heatup Following Loss of Water During Storage* (1979)
NUREG/CR-6331	*NUREG/CR-6331, Atmospheric Relative Concentrations in Building Wakes* (1997)
NWPA	Nuclear Waste Policy Act
OA tr.	Transcript of December 7, 2000 oral argument
Orange County	Board of Commissioners of Orange County
PWR	Pressurized Water Reactor
SAMDAs	Severe Accident Mitigation Design Alternatives
Schmitz and Papin study	Franz Schmitz and Joelle Papin, *High burnup effects on fuel behavior under accident conditions: the tests CABRI REP-Na 270*, Journal of Nuclear Materials 55 (1999)
Shearon Harris	Shearon Harris Nuclear Power Plant
TEDE	Total Effective Dose Equivalent
Thompson 1999 Report	Gordon Thompson, *Risks and Alternative Options Associated with Spent Fuel Storage at the Shearon Harris Nuclear Power Plant* at 1 (February 1999)
Thompson 2000 Report	Gordon Thompson, *The Potential for a Large, Atmospheric Release of Radioactive Material From Spent Fuel Pools at the Harris Nuclear Power Plant: The Case of a Pool Release Initiated by a Severe Reactor Accident* at 13 (November 20, 2000)

BRIEF FOR PETITIONER

I. JURISDICTIONAL STATEMENT

This case involves two consolidated appeals, Nos. 01-1073 and 01-1246, in which the U.S. Nuclear Regulatory Commission ("NRC") has issued final orders that dispose of all of Orange County's claims in an NRC licensing proceeding. The Court has jurisdiction over both appeals pursuant to 28 U.S.C. § 2342(a), the Atomic Energy Act, 42 U.S.C. § 2239(a), and the Administrative Procedure Act, 5 U.S.C. § 702. In No. 01-1073, the NRC made a final decision on December 21, 2000, which the Board of Commissioners of Orange County (hereinafter "Orange County") appealed on February 16, 2001. In No. 01-1246, the NRC's decision became final on May 10, 2001, and Orange County appealed it on May 31, 2001.

II. STATUTES AND REGULATIONS

Relevant statutes and regulations are included in an addendum to this brief.

III. ISSUES PRESENTED FOR REVIEW

(1) Did the NRC violate the National Environmental Policy Act ("NEPA") by excluding relevant environmental considerations from the scope of an evidentiary proceeding on the probability of a severe accident in the spent fuel pools at the Harris nuclear power plant?

(2) Did the NRC violate its own regulations governing the admissibility of contentions for a hearing?

(3) In ruling on the probability of a single seven-step accident scenario leading to a spent fuel pool fire, did the NRC impermissibly shift the burden of proof from the NRC Staff to Orange County?

(4) Was the NRC's ruling on the probability of a single seven-step accident scenario leading to a spent fuel pool fire arbitrary and capricious?

(5) Was the NRC's decision to issue a license to Carolina Power & Light Co. ("CP&L") before conclusion of a hearing arbitrary and capricious and in violation of NRC regulations and NEPA?

IV. STATEMENT OF THE CASE

In this NEPA appeal, Orange County seeks reversal of three NRC decisions that resulted in the granting of a license amendment to CP&L for its Harris nuclear power plant in North Carolina.[1] CP&L requested the license amendment in order to address its mounting inventory of spent nuclear fuel, for which there is no currently available means of permanent disposal.[2] In the interim, CP&L's storage method has been to place spent fuel assemblies in racks in the pools that are present on its reactor site. In its application to the NRC, CP&L sought to place 4,715 spent fuel assemblies in two previously unused pools (pools "C" and "D"). In order to maximize the amount of spent fuel that could be placed in each pool, CP&L proposed to use closed-frame "high-density" racks. These racks have a substantially different design than the open-frame low-density racks that initially were used for spent fuel storage at nuclear power plants.

In 1999, Orange County, a neighbor of the Harris plant, sought a hearing before the NRC on CP&L's proposed license amendment. Orange County was concerned that the design of high-density storage racks makes spent fuel vulnerable to fire if water is lost from the pools, resulting in a catastrophic radiological release to the surrounding area.

Consequently, Orange County submitted a contention that, before the license amendment could be issued, the NRC must prepare an Environmental Impact Statement ("EIS") that

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1 The nuclear plant is also known as "Shearon Harris."

2 While the Department of Energy recently made an announcement that it considers Nevada's Yucca Mountain to be a suitable site for a repository for spent fuel and other radioactive waste, that decision will be subject to challenge by the State of Nevada and other

addressed the environmental impacts of a severe accident in the spent fuel storage pools. In addition, an EIS would evaluate the alternative technology of dry storage, which would completely avoid the danger of a pool fire.

The NRC admitted Orange County's contention for litigation, but limited it to only one portion: the question of whether a single accident scenario was probable enough to warrant consideration in an EIS. *Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), LBP-00-19, 52 NRC 85 (2000) (hereinafter "LBP-00-19"), J.A. __. LBP-00-19 excluded consideration of other relevant potential accidents identified by Orange County, or the overall probability of an accident.

After a summary evidentiary proceeding on the admitted portion of Orange County's contention, the NRC dismissed it in *Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), LBP-01-09, 53 NRC 239 (2001) (hereinafter "LBP-01-09"), J.A. __. The NRC found that the NRC Staff had met its burden of proof to show that the accident postulated by Orange County was so remote and speculative as to preclude the necessity for an EIS, and that there was no need for a full trial-type hearing to explore that issue.

Prior to the NRC's decision to reject the credibility of Orange County's posited accident scenario, the NRC prematurely issued the license amendment to CP&L. United States Nuclear Regulatory Commission, *Carolina Power & Light Company,* Docket No. 50-400, Notice of Issuance of Amendment to Facility Operating License and Final Determination of No Significant Hazards Consideration (hereinafter "NSH Determination"), J.A. ___. The NRC claimed that the license amendment satisfied the agency's requirements for an exemption to the prior hearing requirement of the Atomic Energy Act.

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parties. Yucca Mountain must also be licensed by the NRC before it can open.

Orange County sought review of each of these three decisions within the agency.[3] In *Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), CLI-01-07, 53 NRC 113 (2001) (hereinafter "CLI-01-07") [J.A. __], the Commission called for further briefing by the NRC Staff, without granting the County's petition for review of the NSH Determination. Several weeks later, the Commission issued CLI-01-11, in which it denied Orange County's petition for review of LBP-00-19 and LBP-01-09 [53 NRC at 394, J.A. __], and terminated its consideration of the NSH Determination on the ground that it was no longer relevant. 53 NRC at 381 n. 1, J.A. __.

Orange County petitioned this Court for review of the NSH Determination on February 16, 2001; and LBP-01-09 on May 31, 2001. These cases were docketed as Nos. 01-1073 and 01-1246, respectively. On April 22, 2001, the Court granted Orange County's unopposed motion to hold No. 01-1073 in abeyance. On June 1, 2001, Orange County filed a stay motion in No. 01-126, which was denied by an order dated June 29, 2001. On July 11, 2001, Orange County moved to reactivate No. 01-1073 and consolidate it with No. 01-1246. The NRC and CP&L opposed the motion, and counter-moved for dismissal of No. 01-1073. In an order dated October 22, 2001, the Court granted the motion to consolidate and the motion to reactivate No. 01-1073, and ordered that the parties address all issues relevant to both cases in this brief, including the arguments made in the motions to dismiss.

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3 Orange County's Petition for Review and Request for Immediate Suspension and Stay of the NRC Staff's No Significant Hazards Determination and Issuance of License Amendment for Harris Spent Fuel Pool Expansion (December 22, 2000); Orange County's Petition for Review of LBP-00-12, LBP-00-19, and LBP-01-09 (March 16, 2001).

V. STATUTORY FRAMEWORK

A. Atomic Energy Act

1. Hearing requirements of the Atomic Energy Act

Section 189a of the Atomic Energy Act generally requires that the NRC must provide interested members of the public with a prior opportunity for a hearing on any proposed licensing action. 42 U.S.C. § 2239(a)(1)(A). NRC regulations for implementation of NEPA permit the use of § 189a hearings to challenge the NRC's failure to prepare an EIS. 10 C.F.R. § 51.104(b). Throughout the hearing, the applicant bears the burden of proof. 10 C.F.R. § 2.732. As a general rule, licensing proceedings for nuclear power plants are trial-type hearings under 10 C.F.R. Part 2, Subpart G.

A petitioner for a hearing must file "contentions" that set forth, with "basis and specificity," the concerns the petitioner seeks to litigate. 10 C.F.R. § 2.714(b). Contentions must be supported by "sufficient information . . . to show that a genuine dispute exists with the applicant on a material issue of law or fact." *Id.* The scope of the hearing is restricted to the contentions that have been admitted by the ASLB panel that is assigned to hear the case.

2. Determinations of no significant hazards considerations

In the 1983 "Sholly Amendment" to the Atomic Energy Act, Congress made an exception to the prior hearing requirement for license amendments that involve "no significant hazards considerations." 42 U.S.C. § 2239(a)(2). Pursuant to this provision, the NRC may issue a license amendment before completion of a hearing, if it would not:

> (1) Involve a significant increase in the probability or consequences of an accident previously evaluated;
> (2) Create the possibility of a new or different kind of accident from any accident

previously evaluated; or
(3) Involve a significant reduction in a margin of safety.

10 C.F.R. § 50.92(c)(1)-(3). A determination of no significant hazards considerations must be proposed for comment in the Federal Register before it can be put into effect. 42 U.S.C. § 2239(a)(2)(B) and (C), 10 C.F.R. § 50.91(a). A final determination is subject to judicial review under 42 U.S.C. § 2239(b). It is not reviewable by the Commission. 10 C.F.R. § 50.58(b)(6).

B. Nuclear Waste Policy Act

In 1982, Congress passed the Nuclear Waste Policy Act ("NWPA"), 42 U.S.C. § 10101, *et seq.* Among other things, the NWPA adds an intermediate discretionary procedural step to the § 189a hearing process, intended to expedite cases involving expansion of spent nuclear fuel storage capacity at nuclear power plants. 42 U.S.C. § 10154(a). By requesting an "oral argument," any party can trigger a series of hybrid steps in which the parties are allowed to conduct discovery, and then must submit sworn testimony or affidavits and written summaries of facts, data, and arguments on which they intend to rely at oral argument. *Id.* The NRC must evaluate the presentations to determine whether the evidence warrants a full trial-type hearing, under the following standard:

> (1) At the conclusion of any oral argument under subsection (a) of this section, the Commission shall designate any disputed question of fact, together with any remaining questions of law, for resolution in an adjudicatory hearing only if it determines that –
> (A) there is a genuine and substantial dispute of fact which can only be resolved with sufficient accuracy by the introduction of evidence in an adjudicatory hearing; and
> (B) the decision of the Commission is likely to depend in whole or in part on the resolution of such dispute.

42 U.S.C. § 10154(b)(1). Although the NWPA directs the NRC to "encourage and expedite" the "effective use of available storage, and necessary additional storage," it does not permit NRC to override the basic hearing requirement in § 189a of the Atomic Energy Act, NEPA, protection of

public health and safety, or other applicable laws. 42 U.S.C. §§ 10152(1), (4).

NRC's implementing regulations, codified in Subpart K of 10 C.F.R. Part 2, are virtually identical to the language of 42 U.S.C. § 10154(b)(1). *See* 10 C.F.R. §§ 2.1113, 2.1115. In addition, the Subpart K rules contain a provision that expedites discovery. 10 C.F.R. § 2.1111. In a Subpart K proceeding, although the intervenor bears the burden of showing a genuine and substantial material issue of fact that should go to a hearing, the Staff bears the burden of proof on NEPA issues. LBP-01-09, 53 NRC at 248-49. To the extent the applicant supports the Staff's position, it also shares the burden of proof. *Id.*

C. National Environmental Policy Act

NEPA is the "basic charter for protection of the environment." 40 C.F.R. § 1500.1. Its fundamental purpose is to "help public officials make decisions that are based on understanding of environmental consequences, and take decisions that protect, restore and enhance the environment." *Id.* NEPA requires federal agencies to examine the environmental consequences of their actions *before* taking those actions, in order to ensure "that important effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989). The primary method by which NEPA ensures that its mandate is met is the "action-forcing" requirement for preparation of an EIS, which assesses the environmental impacts of the proposed action and weighs the costs and benefits of alternative actions. *Id.* *Robertson v. Methow Valley,* 490 U.S. at 350-51. In an EIS for spent fuel pool storage, for example, the NRC would be required to give a full accounting of the risks of spent fuel pool storage, and would also have to examine alternative technologies for avoiding or mitigating the risk, such as dry storage. *See* discussion at VI.B.1.b, *infra.*

1. Consideration of reasonably foreseeable impacts required

The environmental impacts that must be considered in an EIS include "reasonably foreseeable" impacts which have "catastrophic consequences, even if their probability of occurrence is low." 40 C.F.R. § 1502.22(b)(1). However, environmental impacts that are "remote and speculative" need not be considered. *Limerick Ecology Action,* 869 F.2d 719, 745 (3rd Cir. 1989), citing *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Counsel, Inc.,* 435 U.S. 519, 551 (1978).

In determining whether a particular accident scenario is "reasonably foreseeable," the NRC has held that low probability in quantitative terms is "key." *Vermont Yankee Nuclear Power Corp.* (Vermont Yankee Nuclear Power Station), CLI-90-7, 32 NRC 129, 131 (1990). The NRC has not fixed a line of demarcation between probability that is considered "reasonably foreseeable" and probability that is considered "remote and speculative." CLI-01-11, 53 NRC at 388 note 8. However, the Commission has refused to rule out an accident probability of 10^{-4} per year as remote and speculative. *Vermont Yankee Nuclear Power Corp.* (Vermont Yankee Nuclear Power Station), CLI-90-4, 31 NRC 333, 334 (1990). As the ASLB observed in LBP-00-19, the Commission's ruling in *Vermont Yankee* suggests that a probability of 10^{-5} per year should not be rejected out of hand as remote and speculative. 52 NRC at 97.

2. Continuing duty to consider new information

A federal agency "has a continuing duty to gather and evaluate new information relevant to the environmental impact of its actions." *Warm Springs Dam Task Force v. Gribble,* 621 F.2d 1017, 1023-24 (9th Cir. 1980), citing 42 U.S.C. § 4332(2)(A), (B). "When new information comes to light the agency must consider it, evaluate it, and make a reasoned determination whether it is of such significance as to require implementation of formal NEPA filing

procedures." *Id. See also Friends of the Clearwater v. Dombeck,* 222 F.3d 552, 558 (9th Cir. 2000) (finding "no evidence in the record" that Forest Service had considered new information bearing on sufficiency of programmatic EIS to support individual timber sale). Where aspects of a proposed action are addressed by a previously prepared EIS, a new EIS must be issued if there remains "major federal action" to occur, and if there is new information showing that the remaining action will affect the quality of the human environment "in a significant manner or to a significant extent not already considered." *Marsh v. Oregon Natural Resources Council,* 490 U.S. 360, 374 (1989).

VI. STATEMENT OF FACTS

A. Description of the Petitioner

Orange County is a political subdivision of the State of North Carolina, charged with carrying out state policies on a local level and authorized to protect the citizens of the County through its police powers. The entire county lies within the 50-mile "Ingestion Pathway Zone"[4] around the Harris facility, and part of the county lies within 15 miles of the plant. The Harris plant lies within 30 miles of the county seat in Hillsboro, and within 20 miles of Chapel Hill, a major population center in Orange County.

B. Environmental Impacts of Spent Fuel Storage

At a commercial nuclear power plant, electricity is generated by fission reactions in radioactive "fuel rods" in the plant's reactor.[5] Fuel rods are grouped together in "assemblies." After a fuel assembly is "spent" in the sense that it no longer can be used to generate power, it is discharged from the reactor. However, at this point in its life the assembly is much more dangerous than when it entered the reactor. It emits heat and intense radiation, and contains a large inventory of radioactive material. Gordon Thompson, *Risks and Alternative Options Associated with Spent Fuel Storage at the Shearon Harris Nuclear Power Plant* at 1 (February 1999) (hereinafter "Thompson 1999 Report"), J.A. __.

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4 The Ingestion Pathway Zone defines an emergency planning area where the expected principal exposure to radiation would be through the ingestion of contaminated water or food. *See* NUREG-0654, Rev. 1, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants* (1980); 10 C.F.R. § 50.47(c)(2).

5 Harris is a pressurized water reactor ("PWR"). The other common type of reactor is a boiling water reactor ("BWR.").

1. Alternative methods for spent fuel storage

Essentially, there are two available methods of storing spent fuel: wet and dry storage.

a. Wet storage

U.S. nuclear power plant designs always include one or more fuel storage pools. These pools are connected to the reactor vessel during refueling operations, which occur under water. In addition, the pools have space for storage of spent fuel. The fuel assemblies are stored vertically in racks and are kept cool by circulation of water. In turn, the water is extracted from the pool, cooled in heat exchangers, and then returned to the pool.

When the present generation of nuclear power plants first began operation in the 1970s, their spent fuel pools were equipped with low-density, open-frame racks. These racks allowed free circulation of water around the fuel assemblies. If water were lost from a pool equipped with open-frame racks, air or steam could circulate freely through the fuel assemblies, thereby cooling the assemblies. As a result, the fuel cladding would ignite, if at all, only in rare conditions. Thompson 1999 Report at 12, J.A. __.

Over the past two decades, spent fuel inventories at nuclear plants have mounted, due to the lack of other means of spent fuel management. Plant licensees have responded to this problem by substantially increasing the density at which fuel is stored in the existing spent fuel pools. Center-center distances have been reduced to as little as nine inches for PWR fuel. In order to increase the density of storage, licensees have been obliged to use racks in which each fuel assembly is surrounded by solid, neutron-absorbing panels. These panels are needed to suppress criticality, or a runaway chain reaction. The panels limit the flow of coolant (water, air or steam) to a mode of circulation in which the coolant enters each rack cell from below, rises vertically through the cell, and leaves the cell at its top. If water is lost from a pool equipped

with racks of this kind, the fuel cladding will ignite over a wide range of conditions. *See* discussion, *infra,* at 15-16 and note 8.

b. Dry storage

Dry storage is an alternative to wet storage that involves placement of the spent fuel in containers (casks or canisters) that are filled with a noncorrosive gas such as helium. Cooling is achieved by convective (i.e., passive) circulation of air over the fuel containers. In comparison with high-density pool storage, dry storage is more expensive because it requires the purchase and installation of new equipment. However, dry storage eliminates the potential for a pool fire and, if properly executed, dramatically reduces the potential for other modes of release of the radioactive material in spent fuel. Thompson 1999 Report at 11-12, J.A. __.

2. Spent Fuel Pool Hazards

By allowing nuclear power plant licensees to adopt high-density storage of spent fuel in pools, the NRC has created the potential for pool fires leading to large radioactive releases to the environment. This hazard did not exist when the present generation of nuclear plants first entered service, and spent fuel pools were equipped with low-density, open-frame racks.

In a pool fire, which could be described more precisely as a "self-propagating exothermic oxidation reaction," air or steam would react with the zirconium alloy cladding of the spent fuel and, potentially, with other materials in the pool. Radioactive material would be released from the spent fuel to the interior of the fuel handling building and from there to the outside atmosphere. The material released to the atmosphere would then travel downwind in a plume and contaminate the surrounding offsite environment. Thompson 1999 Report at B-1, D-1, Appendix E, J.A. ____.

At Harris, a pool fire could release 70 million Curies of radioactive cesium-137, which

has a half-life of 30 years. In typical weather conditions, this release would contaminate an area of land greater than the area of North Carolina. Note that the Chernobyl accident released about 2 million Curies of cesium-137, a small fraction of the release that would occur for a typical pool fire at Harris. Thompson 1999 Report at 11-12, J.A. __.

C. NRC EISs Regarding Severe Accident Risks in Spent Fuel Storage Pools

1. Most recent EIS for spent fuel pool risk was prepared in 1979.

Since the early 1980's, the EISs for the licensing of all U.S. nuclear plants have considered the potential for severe accidents in nuclear reactors, involving degradation of the reactor core. The NRC has invested considerable resources in understanding the behavior of reactor core accidents, and has conducted in-depth probabilistic risk assessments regarding the risks of degraded core accidents. Gordon Thompson, *The Potential for a Large, Atmospheric Release of Radioactive Material From Spent Fuel Pools at the Harris Nuclear Power Plant: The Case of a Pool Release Initiated by a Severe Reactor Accident* at 13 (November 20, 2000) (hereinafter "Thompson 2000 Report"), J.A. ___.

Although spent fuel pools hold the majority of the radiological inventory of nuclear power plants, no comparable effort has been made with respect to understanding spent fuel pool accidents. This omission has been based on the findings of the NRC's first major study of reactor accidents, the Reactor Safety Study (WASH-1400), that the risks of beyond-design-basis accidents in spent fuel pools were orders of magnitude below the risks of a reactor core accident. *See NUREG-1353, Regulatory Analysis for the Resolution of Generic Issue 82, Beyond Design Basis Accidents in Spent Fuel Pools"* at ES-1 (1989) (hereinafter "NUREG-1353"). Therefore, the potential for spent fuel pool accidents is not evaluated in EISs for the licensing of individual

nuclear power plants.[6]

In 1979, the NRC prepared a generic EIS on the environmental impacts of spent fuel storage, which includes a discussion of spent fuel pool accidents. NUREG-0575, Handling and Storage of Spent Light Water Power Reactor Fuel (1979) (hereinafter "GEIS"). The GEIS concluded that:

> Increased spent fuel storage with AR [at reactor] or AFR [away-from-reactor] storage normally involves only aged fuel. The underwater storage of aged spent fuels is an operation involving an extremely low risk of a catastrophic release of radioactivity.

Id. at 4-13, J.A. __. For virtually all of the accidents considered, the NRC assumed that the water level in the pool would not fall, and concluded that an accident under water would not lead to a significant offsite release. GEIS at 4-17 –4-22, J.A. __. In Section 4.2.3.7, the NRC did consider the effects of a lowering of the water level in a spent fuel pool, and concluded that:

> While the loss of all water is beyond the design basis envelope, it involves only low risks for independent spent fuel storage installations in which only aged spent fuel is stored. The major consequence of such an unlikely event would be a small skyshine dose at a site boundary.

Id. at 4-21, J.A. __. Thus, the GEIS examined only a complete loss of water from the spent fuel pool, not a partial loss of water. Moreover, it assumed that aged fuel would not burn.[7] As a result, the GEIS discounted the environmental impacts of atmospheric dispersion of radioactive contamination. The GEIS has not been updated since it was issued over 20 years ago.

2. New information regarding spent fuel pool accident risks

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6 In 1983, for example, the NRC Staff prepared an EIS in connection with the proposed issuance of an operating license for the Harris nuclear power plant, Units 1 and 2. NUREG-0972, Final Environmental Statement Related to the Operation of Shearon Harris Nuclear Power Plant Units 1 and 2, Docket Nos. STN 50-400 and 50-401, Carolina Power and Light Company (October 1983) (hereinafter "Harris 1983 EIS"). The EIS examined reactor accidents only, and did not evaluate spent fuel pool accidents.

7 Aged fuel is spent fuel that was not recently discharged from the reactor. Generally,

In 1979, Sandia National Laboratories, an NRC contractor, issued a report on the behavior of spent fuel storage pools under drainage conditions, including partial drainage. *NUREG/CR-0649, Spent Fuel Heatup Following Loss of Water During Storage* (1979), *cited in* Thompson 1999 Report at D-7 – D-8, J.A. __. The study shows the suppression of air cooling due to the presence of residual water, creating the conditions for a runaway reaction between the air and the zirconium cladding on the fuel assemblies. Although the analysis used a crude heat transfer model and neglected to consider some important factors, it provided a first strong indication that partial drainage of spent fuel pools can suppress circulation of air and therefore inhibit the cooling of the fuel. Thompson 1999 Report at D-7 – D-8.

Ten years later, in NUREG-1353, the NRC Staff examined the potential for a fire in fuel recently discharged from a reactor, and concluded that a fire would occur if the pool were completely emptied. *See* Thompson 2000 Report at 44-45, J.A. __. The study did not address fire risks for aged fuel, however; nor did it evaluate a partial drainage condition. ***Id.*** Nevertheless, the NRC Staff concluded that there was a need for further analysis of the risks of spent fuel pool storage, for two reasons:

> First, spent fuel is being stored instead of reprocessed. This has led to the expansion of onsite fuel storage by means of high density storage racks, which results in a larger inventory of fission products in the pool, a greater heat load on the pool cooling system, and less distance between adjacent fuel assemblies. Second, some laboratory studies have provided evidence of the possibility of fire propagation between assemblies in an air cooled environment. *Together, these two reasons provide the basis for an accident scenario which was not previously considered.*

NUREG-1353 at ES-1 (emphasis added). In spite of this recommendation and the indications of the 1979 Sandia Study, however, the NRC did not revisit the 1979 GEIS.

In 1999, the NRC Staff decided to evaluate whether it was reasonable to relax emergency

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fuel is considered to be aged when one or more years have elapsed since its discharge.

planning requirements for nuclear power plants that had ceased to operate and were in the process of decommissioning. Recognizing that the predominant source of risk remaining at permanently shutdown plants involves spent fuel storage pool accidents, the NRC undertook a study of pool storage risks, and issued a draft report on February 22, 1999. *Draft Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants* ("Draft Technical Study"). Dr. Thompson, a nuclear safety expert hired by Orange County to evaluate the risks of the Harris spent fuel pool expansion proposal, submitted comments charging that the Draft Technical Study was deficient. In particular, he charged that the Draft Technical Study assumed instantaneous and complete pool drainage, and did not address the more severe condition posed by partial drainage of a spent fuel pool. Letter from Gordon Thompson to Richard F. Dudley re: Spent Fuel Pool Accidents (September 30, 1999). In support of his comments, Dr. Thompson enclosed the February 1999 report he had prepared for Orange County, and which was submitted several months later in support of Orange County's contentions. The report cited the 1979 Sandia study, and also provided Dr. Thompson's own detailed technical analysis of the risks of partial drainage accidents. Thompson 1999 Report, Appendix D.[8] Once again, the NRC failed to revisit the GEIS in light of the significant new information provided by Dr. Thompson.

D. Harris License Amendment Proceeding

1. CP&L's proposal to expand Harris spent fuel pool storage capacity

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8 The NRC Staff later conceded the correctness of Dr. Thompson's analysis in the final version of the study. *Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants* (October 2000). (While the report is dated October 2000, it was not publicly released until January of 2001). The Technical Study confirmed that once the pool water level drops far enough to expose the fuel assemblies, fuel of any age must be assumed to burn.

The Harris nuclear plant was originally designed to have four units, with four reactors and four pools for storage of spent fuel. However, only one reactor unit was built and licensed in 1983. Although CP&L built all four storage pools, only pools A and B were fully equipped and licensed. Pools A and B are licensed for storage of 3,669 assemblies in high-density racks. The pools are used to store spent fuel from Harris, as well as spent fuel from two other CP&L plants, Brunswick and Robinson.

The license amendment that is the subject of this appeal permits CP&L to put pools C and D into service, for storage of an additional 4,715 fuel assemblies from Harris, Brunswick and Robinson. The storage racks permitted by the license amendment have an even higher density than the racks in pools A and B.[9] The amendment increases the total spent fuel storage capacity of the Harris plant to 8,343 assemblies, over a thousand more assemblies than were assumed in the original EIS that was prepared in support of the Harris operating license in 1983.[10]

2. NRC License Amendment Proceeding

The NRC license amendment proceeding for the proposed expansion of spent fuel storage at Harris began in early 1999, when the NRC Staff published a notice of the proposed license amendment and opportunity to request a hearing. Carolina Power & Light; Notice of Consideration of Issuance of Amendment to Facility Operating License, Proposed No Significant Hazards Determination, and Opportunity for a Hearing, 64 Fed. Reg. 2,237, 2,239-10 (January

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9 The permissible center-to-center distance between pressurized water reactor ("PWR") fuel assemblies in pools A and B is 10.5 inches. For pools C and D, the permissible distance between PWR assemblies is 9 inches.

10 *See* Harris 1983 EIS. The license application discussed in the 1983 EIS called for storage of up to 7,640 assemblies in the pools. *See* CP&L License Amendment Application, Enclosure 5 at 2 (December 23, 1998).

13, 1999), J.A. ___.[11] Orange County filed and was granted a hearing request. *Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plant), LBP-99-25, 50 NRC 25 (1999).[12]

On December 15, 1999, the NRC Staff issued an Environmental Assessment ("EA"), which concluded that the proposed expansion of spent fuel storage capacity of Harris would not pose a significant impact on the human environment requiring preparation of an EIS, due to the "negligible" potential for a spent fuel pool accident. Environmental Assessment and Finding of No Significant Impact Related to Expanding the Spent Fuel Pool Storage Capacity at the Shearon Harris Nuclear Power Plant (TAC No. MA4432) at 6, J.A __.

a. Orange County's Contention EC-6

Orange County filed a set of contentions challenging the Staff's refusal to prepare an EIS. Orange County's Request for Late-Filed Admission of Environmental Contentions (January 31, 2000) ("Environmental Contentions"), J.A. __. The contentions were supported by Dr. Thompson's February 1999 Report, J.A. __.

The County's first contention (later numbered "EC-6" by the ASLB) charged in relevant part as follows:

> [T]he proposed expansion of spent fuel pool storage capacity at Harris would create accident risks that are significantly in excess of the risks identified in the EA, and significantly in excess of accident risks previously evaluated by the NRC Staff in the EIS for the Harris operating license. These accident risks would significantly affect the quality of the human environment, and therefore must be addressed in an EIS.
>
> There are two respects in which the proposed license amendment would significantly increase the risk of an accident at Harris:
>
> (1) CP&L proposes several substantial changes in the physical characteristics and

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11 The Federal Register notice included a proposed determination of no significant hazards considerations, which is discussed below in Section ___.

12 After a Subpart K proceeding on two technical contentions, the ASLB dismissed these contentions on the merits in LBP-00-12, 51 NRC 247 (2000).

> mode of operation of the Harris plant. The effects of these changes on the accident risk posed by the Harris plant have not been accounted for in the Staff's EA. The changes would significantly increase, above present levels, the probability and consequences of potential accidents at the Harris plant.
>
> (2) During the period since the publication in 1979 of NUREG-0575, the NRC's Generic Environmental Impact Statement ("GEIS") on spent fuel storage, new information has become available regarding the risks of storing spent fuel in pools. This information shows that the proposed license amendment would significantly increase the probability and consequences of potential accidents at the Harris plant, above the levels indicated in the GEIS, the 1983 EIS for the Harris operating license, and the EA. The new information is not addressed in the EA or the 1983 EIS for the Harris operating license.
>
> Accordingly, the Staff must prepare an EIS that fully considers the environmental impacts of the proposed license amendment, including its effects on the probability and consequences of accidents at the Harris plant. As required by NEPA and Commission policy, the EIS should also examine the costs and benefits of the proposed action in comparison to various alternatives, including Severe Accident Mitigation Design Alternatives ("SAMDAs") and the alternative of dry storage.

Id., J.A. ___. The contention was supported by a lengthy and detailed statement of its basis, which also referenced Dr. Thompson's report. In the statement of basis, Orange County pointed out the inadequacies in the EA and the underlying GEIS:

> New information, developed after the publication of the GEIS, shows that total or partial loss of water from a fuel pool containing high-density racks can initiate an exothermic reaction of fuel cladding, either an air-zirconium reaction or a steam-zirconium reaction. Once initiated, this reaction could spread to nearby, previously uninvolved, fuel assemblies. A significant fraction of the pool's inventory of radioactive isotopes, notably cesium-137, could be released to the atmosphere and would then travel downwind as a plume, causing extensive land contamination. The new information also shows that total or partial loss of water from a fuel pool is not a remote or speculative event. For example, a degraded-core accident at the Harris reactor, with containment failure or bypass, would almost certainly lead to interruption of cooling of the Harris fuel pools, followed by loss of water from the pools through evaporation. Restoration of cooling water or makeup of water lost by evaporation would be precluded because onsite radiation levels would prevent access by personnel. [footnote omitted]
>
> The new information is summarized in a report by Dr. Gordon Thompson, entitled "Risks and Alternative Options Associated With Spent Fuel Storage at the Shearon Harris Nuclear Power Plant" (February 1999). A copy is attached as Exhibit 2. Dr. Thompson's report summarizes the state of knowledge about fuel pool accidents involving water loss

> and exothermic reaction of cladding, both generically and in the context of the Harris plant. The report shows that an accident of this type at the Harris plant could contaminate land with cesium-137 to the extent that relocation of populations could be required over an area as large as North Carolina.
>
> The NRC Staff's EA does not reflect the present state of knowledge about potential accidents in high-density fuel pools. The EA focuses on structural failure of a fuel pool, leading to total loss of water. EA at 5-6. In support of its limited discussion of that limited issue, the EA cites four NRC reports: NUREG/CR-4982, Severe Accidents in Spent Fuel Pools in Support of Generic Issue 82; NUREG/CR-5176, Seismic Failure and Cask Drop Analysis of the Spent Fuel Pools at Two Representative Nuclear Power Plants; NUREG/CR-5281, Value/Impact Analysis of Accident Preventative and Mitigative Options for Spent Fuel Pools; and NUREG-1353, Regulatory Analysis for the Resolution of Generic Issue 82: Beyond Design Basis Accidents in Spent Fuel Pools. EA at 5-6. The present state of knowledge about fuel pool accidents, however, is not confined to that accident scenario or the four reports cited by the NRC Staff. For example, as Dr. Thompson shows in his report, drawing upon other literature and his own analyses, the loss of water from the Harris fuel pools is an almost certain outcome of a degraded-core accident, with containment failure or bypass, at the Harris reactor. See Thompson Report, Appendix C. The EA does not address this matter. In addition, Dr. Thompson's report draws upon other literature and his own analyses to show that partial loss of water from a pool can be a more severe accident condition than total loss of water. See Thompson Report, Appendix D. The EA does not address this issue either. Thus, the EA incorrectly carries forward elements of the outdated understanding of pool accident risk that is reflected in the GEIS.

Id. at 8-10, J.A. __. In addition, Dr. Thompson's report listed a range of events, most not considered by the NRC Staff in the EA, that could lead to partial or complete uncovering of fuel in the Harris pools:

> (a) an earthquake, cask drop, aircraft crash, human error, equipment failure or sabotage event that leads to direct leakage from the pools;
> (b) siphoning of water from the pools through accident or malice;
> (c) interruption of pool cooling, leading to pool boiling and loss of water by evaporation; and
> (d) loss of water from active pools into adjacent pools or canals that have been gated off and drained.

Thompson 1999 Report at C-1, J.A. _.

In further support of its contention that a severe pool accident is "not a remote and speculative event," Orange County set forth a scenario, never before considered by the NRC, by

which a pool fire would be an almost certain outcome of a degraded-core reactor accident with containment failure or bypass. Environmental Contentions at 11-12, J.A. __; Thompson 1999 Report, Section 4, J.A. __[13]

As Orange County pointed out, a degraded-core reactor accident with containment failure or bypass is recognized as a credible event by the NRC for the purpose of evaluating the environmental impacts in EISs, as well as requiring emergency planning for the ten-mile-radius Emergency Planning Zones around nuclear plants. *Id.* at 11. Thus, it would set the "lower bound" of the probability of a pool fire. *Id.*

b. Admission of Contention EC-6

In LBP-00-19, the ASLB admitted the contention, *but only* "as it relates to" the specific sequence postulated by Orange County. The ASLB summarized the sequence as follows:

> 1) a degraded core accident;
> 2) containment failure or bypass;
> 3) loss of all spent fuel cooling and makeup systems;
> 4) extreme radiation doses precluding personnel access;
> 5) inability to restart any pool cooling or makeup systems due to extreme radiation doses;
> 6) loss of most or all pool water through evaporation; and
> 7) initiation of an exothermic oxidation reaction in pools C and D.

52 NRC at 95.[14] The ASLB applied the procedures of Subpart K to establish an expedited schedule that included 60 days for discovery, and required the submission of legal and

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13 To summarize, Orange County presented a scenario in which a degraded-core accident is accompanied by a simultaneous loss of spent fuel pool cooling functions, and radioactive material is able to escape the containment. Radiation is deposited on the reactor site, making it impossible for personnel to restore cooling functions. Manual functions for restoring water to the fuel pools are also rendered infeasible by high radiation levels on the site. The reactor site remains contaminated for a lengthy period, allowing water to evaporate from the pools to the tops of the fuel assemblies. At that point, a catastrophic fire ensues that envelops all four fuel pools.

14 The ASLB's wording of the accident sequence was based on a summary proposed by CP&L and agreed to with minor rewording by Orange County. Applicant's Response to

evidentiary summaries within 30 days after the close of discovery. 52 NRC at 100. An oral argument was scheduled for two weeks after the filing of written presentations. *Id.*

Following the brief discovery period, the parties filed written presentations. Orange County filed an extensive legal brief and a detailed expert report by Dr. Thompson.[15] Dr. Thompson began by laying out in detail the elements of an analysis that would provide an estimate of the probability of a pool fire, including the parameters that must be examined and the use of PRA to evaluate them. *See* Thompson 2000 Report, Section 3.1, J.A. __. He emphasized that in the brief time allowed for preparation of testimony under the NRC's rules for expedited proceedings, no party could possibly perform such a sophisticated analysis. *Id.* at 23, J.A. __. Dr. Thompson also provided an extensive discussion of the strengths and limitations of probabilistic risk assessment, the methodology used to quantify the probability and consequences of nuclear accident. *Id.*, Section 2.3, J.A. ___. Dr. Thompson stated his professional opinion, supported by the PRA literature, that, while PRA techniques provide the best available methodology for estimating the overall probability of the seven-part event sequence that has been identified by the ASLB, they have significant limitations and therefore must be used carefully. Thompson 2000 Report at 17, J.A. __. As Dr. Thompson testified, these limitations would affect the quality of any "best estimate" of the overall probability of the seven-part accident scenario, as

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BOCO's Late-Filed Environmental Contentions at 9-10 (March 3, 2000); Orange County's Reply to Applicant's and Staff's Oppositions to Request for Admission of Late-Filed Environmental Contentions at 8 (March 13, 2000), J.A. __.

15 *See* Detailed Summary of Facts, Data, and Arguments and Sworn Submission on which Orange County Intends to Rely at Oral Argument to Demonstrate the Existence of a Genuine and Substantial Dispute with the Licensee Regarding the Proposed Expansion of Spent Fuel Storage Capacity at the Harris Nuclear Power Plant with Respect to the Need to Prepare an Environmental Impact Statement to Address the Increased Risk of a Spent Fuel Pool Accident (November 20, 2000) (hereinafter "Detailed Summary"), J.A. ___; Declaration of Dr. Gordon Thompson (November 20, 2000), J.A. ___; Thompson 2000 Report, J.A. __.

requested by the ALSB. *Id.*

Despite the limitations on the detail of a study that could be performed in the time permitted by the ASLB for preparation of evidence, Dr. Thompson's report provided a methodical analysis of each step of the seven-step accident scenario posed by the ASLB. *Id.*, Section 4, J.A. __; and Appendices C-H, J.A. __. For each step, he described his factual assumptions and the source of his data, his analytical method in approaching the question of the probability of the event, and his estimate of the probability of that step in the chain of events.

In conclusion, Dr. Thompson provided a minimum value of a best estimate of the probability of a Harris pool fire, in the range of 0.2×10^{-5} to 1.2×10^{-4} per year, with a point estimate of 1.6×10^{-5} per year. Thompson 2000 Report, Table 5. This probability is comparable to industry and NRC estimates of the probability of a severe reactor accident, which is generally addressed in an EIS. Environmental Contentions at 11-12.

The NRC Staff and CP&L also filed legal and evidentiary presentations, arguing that the probability of a severe spent fuel pool accident is too small to warrant consideration in an EIS. The Staff provided a probability estimate of 10^{-7} per year, and CP&L provided a probability estimate of 10^{-8}. 53 NRC at 266-67. For the earlier steps of the analysis, the Staff and CP&L relied to a significant extent on pre-existing PRAs. For Step four and beyond, the NRC Staff's analysis primarily consisted of a set of qualitative judgments, supplemented by limited quantitative calculations, while CP&L claimed to perform a new PRA.

An oral argument was held on December 7, 2000. Pursuant to 10 C.F.R. § 2.1113(b), only counsel, and not experts, were permitted to participate. In the oral argument, counsel for Orange County pointed out significant deficiencies in the evidence presented by the Staff and the NRC, such that it could not be relied on by the ASLB in support of any decision to forego

preparation of an EIS, and that a further hearing was required.

E. Decisions Below

On March 1, 2001, the ASLB issued LBP-01-09, which denied Orange County a full evidentiary hearing on Contention EC-6 and found that the Staff had met its burden of showing that no EIS was required. 53 NRC at 271, J.A. __. Therefore, the ASLB terminated the proceeding. *Id.* The decision went through each of the seven accident steps the parties had been asked to address, and compared the evidence presented by the three parties. The decision included the following table comparing the parties' probability estimates:

BCOC Contention EC-6 Accident Scenario Cumulative Probability (S_N)				
Sequence Event (N)		**BCOC (S_N)**	**CP&L (S_N)**	**Staff (S_N)**
1	Degraded core accident	3.1E-05		1.2E-04
2	Containment failure or bypass	1.6E-05	7.7E-06[a]	
3	Loss of SFP Cooling and/or Makeup Loss	1.6E-05		6.3E-06[c]
4	Radiation Dose Precludes Access	1.6E-05		
5	Inability to restart SFP cooling	1.6E-05		2.0E-07[d]
6	Loss of part or all of SFP water by evaporation	1.6E-05	2.7E-08[b]	2.0E-07
7	Initiation of exothermic oxidation reaction in Pools C and D	1.6E-05	2.7E-08	2.0E-07
Overall Sequence Probability (per reactor year)		**1.6E-05**	**2.7E-08**	**2.0E-07**

[a]CP&L combined its analysis of the first two steps.
[b]CP&L combined its analysis of steps three through six.
[c]Staff combined its analysis of steps two and three.
[d]Staff combined its analysis of steps four and five.

53 NRC at 267. For each of the seven steps, the ASLB ruled that Orange County had not met the NRC's standard for proceeding to an evidentiary hearing. 53 NRC at 253-66. The ASLB credited the NRC Staff's testimony on the probability of each of the accident steps, accepted the NRC Staff's estimates that the probability of the seven-step accident is "conservatively in the range of" 2.0×10^{-7} per year, and found that this level of probability falls within the realm of "remote and speculative" events not cognizable under NEPA. LBP-01-09, 53 NRC at 268. The ASLB also found that CP&L's "PRA-enhanced anlaysis" was "a beneficial, although not

dispositive, confirmation of the validity of the Staff's analysis to the degree the CP&L analysis yielded a probability estimate that was equal to or lower than the Staff's estimate." 53 NRC at 252.

On March 16, 2001, Orange County petitioned the NRC Commissioners for review of LBP-01-09 and LBP-01-19.[16] The Commission denied the petition for review in CLI-01-11, finding that the ASLB had "carefully" weighed the evidence presented by the parties and resolved their factual disputes, and had made "intricate and well-supported findings." *Id.*, 53 NRC at 387-89. The Commission affirmed the ASLB's conclusion that the Staff's accident probability estimate of 10^{-7} per year showed that the accident is "remote and speculative," but declined to rule on the question of whether, if it had accepted Orange County's evidence, a probability estimate of 10^{-5} per year requires preparation of an EIS. *Id.*, 53 NRC at 387-88 and n. 8.

F. Proceeding Regarding Determination of No Significant Hazards Considerations.

In the hearing notice that was issued on January 13, 1999 at 64 Fed. Reg. 2,237 [J.A. __], the NRC also commenced a separate proceeding for the making of a determination of No Significant Hazards Considerations. The hearing notice included a proposed NSH Determination. *Id.* The Staff concluded that the proposed license amendment would not involve any of the considerations set forth in 10 C.F.R. § 50.92(c)(1)-(3), and therefore proposed to issue the amendment before the conclusion of any hearing that might be held.

Orange County filed comments regarding the proposed determination, arguing, *inter alia,* that the proposed license amendment did not satisfy the standard for a no significant hazards

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16 Orange County's Petition for Review of LBP-00-12, LBP-00-19, and LBP-01-09 (March 16,

considerations determination, because it creates "the possibility of a new or different kind of accident from any accident previously evaluated." Orange County's Comments in Opposition to No Significant Hazards Determination and Conditional Request for a Stay of Effectiveness (February 12, 1999) (hereinafter "NSH Comments"), J.A. __. As Orange County pointed out, the NRC had performed no site-specific evaluation of the probability or consequences of severe accidents at pools A and B at Harris, such that the NRC could claim that the possibility of a spent fuel accident had ever been evaluated at all. *Id.* at 6. Moreover, Orange County argued that the proposed expansion of spent fuel storage at Harris decreased the margin of safety, thereby precluding a finding of no significant hazards considerations. *Id.* at 7-8.

For almost two years, the NRC took no further action on the proposed NSH Determination. On December 21, 2000, the NRC issued a notice of its final NSH Determination, J.A. __. The notice did not respond to, or even mention, the comments that Orange County had submitted. Moreover, it failed to address the fact that at the time the decision was being issued, Orange County's environmental contention was pending before the ASLB.

On December 22, 2000, Orange County filed a petition for review and a stay motion with the NRC Commissioners. Orange County's Petition for Review and Request for Immediate Suspension and Stay of the NRC Staff's No Significant Hazards Determination, J.A. ___. The Commission neither declined nor accepted review. Instead, it ordered the NRC Staff to submit a brief addressing the Commission's no significant hazards criteria and the "severe accident question," including "a summary of any quantitative data that underlie the Staff's NSHC determinations on accident probability, accident consequences, and margins of safety." CLI-01-07, 53 NRC at 199. On February 28, 2001, the NRC Staff filed NRC Staff Brief in Response to

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2001), J.A. __.

Commission Order of February 14, 2001. Shortly thereafter, on March 1, 2001, the ASLB issued LBP-01-09. In CLI-01-11, the Commission ruled that the issuance of LBP-01-09 had rendered the validity of the NSH Determination "inconsequential for this adjudication." 53 NRC at 381 n.1.

VI. SUMMARY OF ARGUMENT

In the Subpart K proceeding regarding the proposed expansion of spent fuel storage capacity at the Harris nuclear power plant, the NRC violated NEPA by denying Orange County a complete hearing on all of the relevant environmental considerations it had raised, regarding the risk of a catastrophic accident in the Harris spent fuel pools. Orange County satisfied the Commission's requirements for the admission of its contention, by demonstrating with expert testimony and documentary support, new information regarding the risks of spent fuel pool accidents. This new information demonstrated that key assumptions undergirding the NRC's previous environmental analyses, on which it relied for its refusal to prepare an EIS in this case, were invalid; and that as a result, the NRC must revisit the potential for a wide range of accidents in spent fuel pools.

Moreover, in the limited evidentiary presentation that was conducted regarding a single accident scenario, the ASLB and the Commission systematically shifted the burden of proof from the NRC Staff to Orange County. They accomplished this shift in two ways. First, they penalized Orange County for not performing the analysis that the Staff should have done, rather than requiring the Staff's testimony to stand on its own. Second, the ASLB failed to acknowledge that Orange County relied to a significant extent on technical studies prepared by the NRC Staff itself. The ASLB failed to require the NRC Staff to reconcile the inconsistencies between the Staff's technical studies and its testimony in this proceeding. Instead, it treated

information and opinions presented in NRC Staff technical reports as the unsupported opinion of Orange County's expert, and rejected it on that basis.

The ASLB's decision regarding the credibility of the single accident scenario is also arbitrary and capricious, because it relies on an assumption that is fundamentally inconsistent with NEPA. The ASLB accepted the Staff's low probability calculation for the accident scenario, based in part on the Staff's assumption that workers would be exposed to hazardous radiation doses in order to restore makeup water to the pools and thereby prevent an accident from progressing to the point of a fire and radiological release. While it may be acceptable for workers to incur high radiation doses in order to save lives during a real accident, it is not consistent with NEPA to assume environmental harm to workers, when the sole purpose of that assumption is to depress the estimate of the accident's probability and thereby avoid preparation of an EIS. If hazardous impacts to workers are relied on as a means for avoiding the accident, those impacts must be discussed in an EIS.

The ASLB's decision that the accident scenario was too improbable to require an EIS was also arbitrary and capricious because it relied on the adequacy of alleged calculations by CP&L that were never placed in the record, and therefore could not be assumed to exist.

The NRC's NSH Determination was also arbitrary and capricious, violated the NRC's own regulations, and was inconsistent with NEPA. Although the NRC was required to solicit public comments on the determination before making it final, it never responded to Orange County's comments that the NSH Determination was unjustified. Moreover, the NRC failed to adhere to its own regulations, which precluded the issuance of a NSH Determination if the proposed license amendment created even the possibility of a new or different kind of accident from any accident previously evaluated. The ASLB's decision to admit for litigation the

credibility of the accident scenario posed by Orange County established, as a matter of law, the possibility of such a new or different kind of accident, and therefore precluded the issuance of the NSH Determination. Finally, the NRC violated NEPA by issuing the license amendment before the completion of the agency's inquiry into whether the amendment must be supported by the prior issuance of an EIS.

VII. ARGUMENT

A. Standard of Review

An agency's failure to follow its own regulations must be reversed as arbitrary decisionmaking. *Sierra Club v. NRC,* 862 F.2d 222, 229 (9th Cir. 1988). In applying the arbitrary and capricious standard to factually-based decisions by agencies, the Supreme Court has also held that the agency must "examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made." *Burlington Truck Lines, Inc. v. United States,* 371 U.S. 156, 168 (1962).

In reviewing NEPA-related decisions, "courts must determine that this decision accords with traditional norms of reasoned decisionmaking and that agency has taken the 'hard look' required by NEPA." *Foundation on Economic Trends v. Heckler,* 756 F.2d 143, 151 (D.C. Cir. 1985). Moreover,

> The decision not to prepare an EIS can only be overturned if the decision was arbitrary, capricious, or an abuse of discretion. Judicial review of an agency's finding of 'no significant impact' is not, however, merely perfunctory, as the court must insure that the agency took a 'hard look' at the environmental consequences of its decision.

Sierra Club v. Peterson, 717 F.2d 1409, 1413 (D.C. Cir. 1983). Failure to address a "major environmental concern" is fatal to a determination of no significant impact. *Foundation on Economic Trends v. Heckler,* 756 F.2d at 154.

B. The NRC Violated Its Own Regulations and NEPA By Refusing to Consider Orange County's Entire Contention Which Raised Specific New Information About Spent Fuel Pool Fires.

In LBP-00-19, the ASLB admitted only that portion of Contention EC-6 that related to the seven-part accident scenario for a degraded-core accident with containment bypass. 52 NRC at 95. The ASLB did not admit, or even mention, the other portions of the contention which charged that the EA was insufficient to address the overall probability of a spent fuel pool accident. Environmental Contention at 9-11, J.A. __. In CLI-01-11, the Commission defended the ASLB's decision, on the ground that Orange County had offered "no specific causes for spent fuel pool accidents other than the seven-step scenario admitted by the Board," and therefore could not "transform vague references to potential spent fuel pool catastrophes into litigable contentions."[17] 53 NRC at 390, *citing Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 333-35 (1999). The ASLB's failure to admit the entire contention constituted error in two respects.

First, Orange County's contention completely satisfied the Commission's own promulgated standards for admissibility of contentions. Pursuant to 10 C.F.R. § 2.714(b), contentions must be presented with basis and specificity. Postulating a specific accident scenario is not the only legitimate way to meet this standard. A petitioner may also "allege some specific deficiency in the environmental analysis." *Pacific Gas & Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-86-12, 24 NRC 1, 12, *rev'd on other ground sub nom. San Luis*

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17 As further grounds for affirming the ASLB, the Commission also stated that Orange County "expressly approved the final language of its admitted environmental contention," and therefore could not be heard to complain that some part of it had not been admitted. CLI-01-11, 53 NRC at 390. The assertion is incorrect. While Orange County approved CP&L's summary of the steps in the seven-part accident scenario, *see* discussion, *supra,* at note 14, this was only a part of the contention. In no respect did Orange County give its approval to the ASLB's decision

Obispo Mothers for Peace v. NRC, 799 F.2d 1268 (9th Cir. 1986). *See also Township of Lower Alloways Creek v. NRC,* 687 F.2d 723, 746 (3rd Cir. 1982) . In addition, expert opinion and documentary evidence can provide the necessary support for admissibility of a contention. 10 C.F.R. § 2.714(b)(2)(ii). The contention specifically criticized the EA for focusing on accidents involving a total loss of spent fuel pool water. Environmental Contentions at 9-10. It also asserted that the GEIS, on which the EA relies, is outdated and does not reflect new information showing that the risks and consequences of spent fuel pool accidents are higher than previously believed. Moreover, Dr. Thompson's supporting report provided a comprehensive and detailed discussion of the strengths and weaknesses in the current literature regarding spent fuel accident risks. Thompson 1999 Report, *passim.* He also provided scoping calculations regarding the potential for a pool fire under partial drainage conditions. *Id.* at D-3 – D-5, J.A. __. These calculations showed, among other things, that if residual water is present in a pool, thus blocking convective circulation of air or steam, even fuel aged ten years or more would burn. *Id.* Thus, the extensive evidence presented in the contention and Dr. Thompson's report was more than sufficient to demonstrate a material factual dispute regarding the adequacy of the GEIS and the EA to support the NRC's refusal to prepare an EIS in this case.

Second, the ASLB's failure to admit the contention in its entirety violated the NRC's NEPA obligation to consider and evaluate new information and "make a reasoned determination" about its significance to the human environment. *Warm Springs Dam Task Force v. Gribble,* 621 F.2d at 1023-1024. Two fundamental assumptions of the GEIS and EA were shown to be defective by the new information discussed in Orange County's contention. Given that these assumptions were no longer valid, the very underpinnings for the original EIS for the Harris plant

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to ignore a major portion of its contention.

were no longer valid, and the NRC was obligated to look anew at the potential impacts on the environment of spent fuel pool accidents.

C. In Ruling on the Merits of the Admitted Portion of Contention EC-6, the ASLB Unlawfully Shifted the Burden of Proof to Orange County.

As the ASLB ruled in LBP-01-09, the Staff had the burden of proof in the Subpart K proceeding:

> Once [Orange County] crossed the admissibility threshold relative to its accident sequence contention, the ultimate burden in this Subpart K proceeding then rested with the proponent of the NEPA document – the Staff and the Applicant to the degree it becomes a proponent of the Staff's EIS-related action – to establish the validity of that determination on the question whether the accident sequence is an EIS-preparation trigger.

53 NRC at 249. Thus, the NRC Staff had an independent obligation to prove that the seven-part accident scenario that was admitted to the proceeding was remote and speculative. In violation of this requirement, the ASLB and the Commission shifted the burden of proof to Orange County throughout the Subpart K proceeding, and failed to require the Staff to make a defensible decision that no further hearing was required, or that no EIS need be prepared for the Harris license amendment.

1. The Commission and the ASLB shifted the burden of preparing a comprehensive analysis to Orange County.

Instead of holding the Staff to its burden of proof, the Commission and the ASLB repeatedly declared that the Staff had prevailed by virtue of Orange County's perceived failure to prove the Staff wrong. The burden of proof belonged to the Staff, not Orange County.

a. CLI-01-11

One of the Commission's principal grounds for denying review in CLI-01-11 was that Dr. Thompson did not, himself, undertake the comprehensive analysis that he testified was required in order to justify the Staff's refusal to prepare an EIS. 53 NRC at 388. The Commission declared a hearing futile, because "Orange County apparently intends merely to reiterate its critique of the probabilistic risk assessment of others (the NRC Staff and CP&L), but not to offer a fresh analysis of its own." 53 NRC at 389. Thus, the Commission unlawfully imposed on Orange County, as a condition to obtaining a full evidentiary hearing, the burden of establishing that the accident scenario was not remote and speculative by means of a PRA.[18]

b. LBP-01-09, Event 4

For Event 4, it was necessary to predict the likelihood that in the aftermath of a degraded core accident with containment bypass, workers would be unable to re-enter the site for the purpose of restoring water to the spent fuel pools. The prediction required a calculation of the onsite radiation levels that would exist as a result of a release from the containment.

The ASLB shifted the burden of proof from the NRC Staff to Orange County with respect to Event 4, by faulting Orange County for using a scoping calculation rather than attempting to perform "detailed calculations of expected radiation fields" at various locations on the site. 53 NRC at 260. The ASLB criticized Orange County's scoping calculation as

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18 It is noteworthy that the Commission did not impose the same burden on the NRC Staff. Both the Commission and the ASLB accepted the Staff's analysis as sufficient, even though it fell considerably short of constituting a PRA. CLI-01-11, 53 NRC at 387; LBP-01-09, 53 NRC at 252. Both the Commission and the ASLB failed to address or refute in any way Dr. Thompson's expert opinion that a PRA was necessary for assessing the probability of the accident, insofar as it could be estimated.

"unreasonably conservative" and lacking in "scientific basis," because it failed to "account for building and equipment configuration, historical meteorological data, and accident scenarios." *Id.* The ASLB completely ignored Dr. Thompson's testimony that the constraints of the proceeding and the limitations on available methodologies did not permit a comprehensive or sufficient analysis by *any* party, including the NRC Staff. Thompson 2000 Report at 23. Instead, the ASLB accepted the Staff's analysis as "credible," without confronting Dr. Thompson's testimony regarding the difficulties of performing a reliable analysis. 53 NRC at 260, 256 note 5. *See also* discussion in Section C.2.c, *infra.*

Thus, the ASLB faulted Orange County for not performing the comprehensive analysis that it should have required of the NRC Staff. The County was not required to prove the Staff's error by doing the Staff's job of performing its own probabilistic calculations.

2. The ASLB failed to require the Staff to justify its failure to adhere to the conclusions presented in the Staff's own technical reports.

Throughout his report, Dr. Thompson consistently relied on studies prepared by or for the NRC for his probability estimates for the seven-step accident scenario. In crediting the NRC Staff's testimony, the ASLB repeatedly failed to recognize that the NRC Staff itself was a principal source for Orange County's evidence. Thus, instead of correctly identifying a conflict between NRC Staff members that implicated the Staff's ability to meet its burden of proof, the ASLB ascribed the conflicting view to Orange County and dismissed it as unworthy of consideration.

a. LBP-01-09, Event 2

(i) Containment bypass

For Event 2, it was necessary to predict the likelihood that following a degraded core accident, radiation would escape the containment via a breach in or bypass of the containment. 53 NRC at 254. Relying exclusively on a single NRC Staff study, Orange County examined the likelihood of one particular mode of containment bypass, temperature-induced steam generator tube rupture (TI-SGTR), and reported a conditional likelihood of 50% that it would occur. Thompson 2000 Report at 26-28, citing NUREG-1570, *Risk Assessment of Severe Accident-Induced Steam Generator Tube Rupture* (March 1998) (hereinafter "NUREG-1570").

The ASLB rejected this piece of evidence as "far too simplistic," because Orange County allegedly had not considered "recent procedural changes adopted by CP&L not to run reactor coolant pumps after a severe accident," or linked a variety of containment failure or bypass modes with specific degraded-core sequences. 53 NRC at 255-56. In reaching its conclusion, the ASLB completely sidestepped the fact that the evidence relied on by Dr. Thompson was the NRC Staff's own study, which Dr. Thompson had not modified or qualified in any way. Thompson 2000 Report at 26-28. NUREG-1570 did, in fact, consider the relevant details of accident scenarios, equipment configurations and plant operating procedures. *Id.* Moreover, NUREG-1570 did not rely on any assumption that reactor coolant pumps would operate during a degraded-core sequence. *See* Transcript of December 7, 2000, oral argument at 472-74 (hereinafter "Arg. Tr."), J.A. __. The ASLB failed to hold the NRC Staff to its burden of proving that its own study was inadequate to support a conditional probability estimate of 50% for Event 2.

(ii) Transport mechanism

Event 2 also required a prediction of the form and transport mechanism by which radioactive material could escape the containment. Dr. Thompson predicted that the high-burnup fuel used at Harris would be subject to fragmentation and powdering, which will increase the volume of radioactive material released to the environmental during an accident. Thompson 2000 Report at 28-29 and Appendix D, J.A. __. Dr. Thompson also testified that the presence of fragmented and powdered fuel in the release would promote onsite deposition, and that these effects could be supplemented by hard-to-model phenomena such as aerosol agglomeration and plume rainout. *Id.* For these predictions, Dr. Thompson relied on several studies, including a report by the NRC Staff, NUREG-1465, *Accident Source Terms for Light-Water Nuclear Power Plants* (February 1995) (hereinafter "NUREG-1465").

The ASLB completely ignored Orange County's reliance on NUREG-1465. This study could not provide more explicit support for Orange County's position:

> Recent information has indicated that high burnup fuel, that is, fuel irradiated at levels in excess of about 40 GWD/MTU, may be more prone to failure during design basis reactivity insertion accidents than previously thought. *Preliminary indications are that high burnup fuel also may be in a highly fragmented or powdered form, so that failure of the cladding could result in a significant fraction of the fuel itself being released.*

NUREG-1465 at 14 (emphasis added). The study provided prima facie evidence that the Staff's testimony in the Subpart K proceeding had not come to terms with the Staff's own scientific research. By failing to address this internal conflict within the NRC Staff, the ASLB failed to hold the Staff to its burden of proof.[19]

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19 Moreover, the ASLB gave no reason, nor is there any apparent reason, for its bald assertion that another study relied on by Dr. Thompson, Franz Schmitz and Joelle Papin, *High burnup effects on fuel behavior under accident conditions: the tests CABRI REP-Na 270*, Journal of Nuclear Materials 55 (1999) (hereinafter "Schmitz and Papin study"), is not

b. LBP-01-09, Event 3

Event 3 required a prediction of the likelihood that spent fuel pool cooling functions and the ability to provide makeup water would be lost. With respect to Event 3, the ASLB asserted that, "[t]e Board is seriously troubled by BCOC's [Orange County's] claim of certainty -- its use of a probability of one -- that there will be a loss of SFP cooling as a result of a degraded core accident and containment failure." 53 NRC at 257. *See also* 53 NRC at 253 (all of the degraded core sequences identified by Orange County "lead finally to a loss of cooling to the fuel pools"). Nowhere in Dr. Thompson's report did he state that a loss of pool cooling will *result* from a degraded core accident and containment failure. To the contrary, for each of the four degraded core scenarios evaluated by Dr. Thompson, he stated that "the spent fuel pool cooling system would become inoperative at the beginning of the sequence." Thompson 2000 Report at 29. Dr. Thompson did not reach this conclusion as a matter of his own professional judgment, but took it straight out of a Probabilistic Safety Analysis performed by CP&L. *Id.* at C-1 - C-2, J.A. __. In LBP-01-09, the ASLB specifically approved of CP&L's and the Staff's reliance on CP&L's previously conducted probabilistic safety assessments for the Harris plant. 53 NRC at 252, 253-54. Yet, when Orange County relied on one of these studies, the Board claimed it was "seriously troubled." 53 NRC at 257. By denying Orange County the right to rely for its own purposes on the very same evidence the ASLB had approved as supportive of CP&L's and the Staff's case, the ASLB shifted the burden of proof to Orange County.[20]

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representative of the circumstances at Shearon Harris." 53 NRC at 256, n. 5. Orange County cited the Schmitz and Papin study for the report's general observation that high-burnup fuel can be highly fragmented. Thompson 2000 Report at D-3. On its face, the observation is applicable to Harris, which uses high-burnup fuel. The ASLB was not entitled to deny the study's relevance without providing some explanation.

20 The ASLB also claims that Orange County "seemingly ignores the fundamental

c. LBP-01-09, Event 4

Orange County presented evidence that the NRC Staff's method for calculating onsite radiation doses was insufficient because it relied on the ARCON computer code to predict the behavior of the radioactive plume that escapes the containment. As Dr. Thompson explained, ARCON is a straight-line Gaussian model. *See* Thompson 2000 Report at D-4, J.A. __ , citing *NUREG/CR-6331, Atmospheric Relative Concentrations in Building Wakes* (1997) (hereinafter "NUREG/CR-6331"). As such, he opined, it "can shed little light" on building wake effects.[21] *Id.* Dr. Thompson also testified that by themselves, such building wake effects could lead to significant onsite deposition of radioactive material.

As discussed above in Section C.1.b, the ASLB unlawfully shifted the burden of proof to Orange County by faulting it for not having done a more sophisticated analysis than a scoping study. In addition, the ASLB casually dismissed Orange County's criticism of the Staff's reliance on the ARCON model, without acknowledging that it was the Staff's own document which describe the ARCON model as a straight-line Gaussian model. 53 NRC at 256, n. 5.[22]

The basic diffusion model implemented in the ARCON 96 code is a straight-line Gaussian

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benefits of engineered safety principles, such as physical separation, redundancy, and diversity in connection with equipment necessary for SFP cooling." 53 NRC at 257. This assertion ignores the fundamental nature of severe accidents, which is that they involve events that are not anticipated by the application of engineered safety principles to the design of nuclear power plant safety systems. This is why they are commonly referred to as "beyond design basis accidents."

21 Wake effects are plume behaviors that, while difficult to model, are easily observable to the layperson. For example, one observes that an automobile with a comparatively flat rear surface tends to accumulate dirt on its rear windows. Also, a pedestrian in a city with high-rise buildings often observes irregular wind patterns at street level.

22 In CLI-01-11, the Commission attempted to cure the ASLB's error by claiming that the ARCON model "is conservative, takes into account site-specific meteorological conditions, and considers building wake effects to a limited degree." 53 NRC at 388 note 9. This assertion begs the question raised by Dr. Thompson, which is whether ARCON, as a straight-line Gaussian model, is adequate to model the complex three-dimensional conditions posed by building wakes in the context of the postulated accident.

> *model* that assumes the release rate is constant for the entire period of release. This assumption is made to permit evaluation of potential effects of accidental releases without having to specify a complete release sequence.

NUREG/CR-6331 at 41, J.A. ___ (emphasis added). Thus, once again, the ASLB shifted the burden of proof to Orange County, by ignoring the fact that the source of Orange County's information was the NRC Staff itself.

d. LBP-01-09, Event 6

For Event 6, it was necessary to predict the likelihood that water lost from the pool due to evaporation could not be restored in time to prevent a spent fuel fire. 53 NRC at 264. Relying on evidence presented by the NRC Staff, the ASLB found that there are "myriad ways" to provide makeup water to fuel pools, and that Orange County had not "adequately accounted for them." In fact, the number of available makeup options identified by both CP&L and the NRC Staff is a finite number: nine. *See* Affidavit of Gareth W. Parry, Stephen F. LaVie, Robert L. Palla and Christopher Gratton In Support of NRC Staff Brief, Etc. at 115-16 (November 17, 2001); Thompson Report at 37-38.

Dr. Thompson's Report addressed the reliability of all nine of these options. *Id.* As he testified, there is a high degree of dependency among these makeup options. He pointed out that all six of the proceduralized options would rely on electrical power, although two of those options would allow a limited and insufficient inventory of water to enter the pools by gravity. Two of the three nonproceduralized options would also rely on electrical power. As Dr. Thompson testified, electric power must be assumed to be unavailable in the aftermath of the accident, and thus these makeup options would not be available. Only one option -- a single diesel fire pump -- would not rely on electrical power. Equally significant, every one of the nine makeup options would rely upon a functioning command structure. *Id.* In the high radiation

environment following a degraded core accident with containment bypass, the control room and its backup Technical Support Center would be nonfunctional for a period considerably exceeding seven days. *Id.*

The ASLB did not address the adequacy of the Staff's analysis in light of these criticisms, or identify any additional makeup functions that Dr. Thompson allegedly failed to address. By failing to hold the NRC Staff to its burden of proof, the ASLB effectively shifted it to Orange County.

D. The ASLB's Decision Regarding The Likelihood Of The Single Seven-Step Accident Violated NEPA and Was Arbitrary and Capricious.

1. The ASLB Unlawfully Assumed Harm to Workers, for the Sole Purpose of Depressing the Staff's Accident Probability Estimate.

As discussed above, in Section V.C, NEPA requires the evaluation of all significant environmental impacts in an EIS. In violation of this fundamental principle, the ASLB unlawfully found that the exposure of Harris workers to radiation doses in excess of federal safety limits could be assumed for the purpose of avoiding the preparation of an EIS.

Event 5 required a prediction of whether workers would be unable to restart cooling or makeup systems due to extreme radiation doses. This part of the analysis built upon Step 4, by determining the doses to which workers would be exposed, given radiation levels on the site and the time it would take to perform restorative functions. Orange County introduced evidence that doses would be in excess of 5 rem, the maximum permissible occupational dose allowed in one year of normal operation by 10 C.F.R. § 20.1201(a)(1). Thompson Report, Sections 4.4 and 4.5, J.A. __.

The Staff predicted that workers would be able to gain access to the site in order to perform their tasks, but based this prediction on the assumption that the workers would be

allowed to receive a radiation dose of up to 25 rem during the incident. 53 NRC at 262. A one-time 25 rem dose is considered acceptable by the U.S. Environmental Protection Agency in emergencies, "for life saving and protection of large populations." LBP-01-09, 53 NRC at 263, citing U.S. EPA, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (October 1991) ("hereinafter EPA PAGs").[23] The ASLB found for the NRC Staff. 53 NRC at 263.

The ASLB based its decision on an assumption that is fundamentally inconsistent with NEPA. In order to come up with a very low probability calculation for a spent fuel pool fire, the NRC Staff assumed that workers would incur doses above regulatory limits for occupational doses, in order to stop the accident from progressing to the point of a pool fire. *See* LBP-01-09, 53 NRC at 262-63. Thus, the NRC Staff's low probability calculation for Step 5 is based in significant part on the Staff's assumption that workers may be exposed to environmental harm, *i.e.,* radiation doses above normal occupational limits. Had the Staff not made this assumption, its probability calculation would have been higher, and may have been found sufficiently high to warrant the preparation of an EIS. The NRC may not avoid the preparation of an EIS that discusses one type of significant environmental harm, on the basis of an assumption that another type of significant environmental harm is acceptable. Such an assumption violates the fundamental principles of NEPA that require the protection of the environment through detailed disclosure of any significant environmental harm that may be caused by major federal actions.

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23 The EPA recommends the use of a 5 rem per year "upper bound" for worker exposures during a radiological emergency. *Id.* at 2-10. In addition, the EPA recommends that doses be kept "as low as reasonably achievable," i.e., even lower than 5 rems per year, as is consistent with the regulation of normal occupational exposures. *Id.* The EPA's guidance makes it clear that doses above 10 rems Total Effective Dose Equivalent ("TEDE") per year are only justified by the protection of "valuable property," and doses up to 25 rems TEDE per year are

See Robertson v. Methow Valley, 490 U.S. at 349 (NEPA's goal of protecting environment served through maximum disclosure of significant adverse environmental impacts).

The ASLB also mischaracterized Orange County's argument, by asserting that Orange County's argument turned on the alleged *unwillingness* of workers to incur high radiation doses in an accident. *Id.* The psychological response of a worker in the face of a nuclear accident is not remotely relevant to Orange County's position. The question that Orange County raised to the ASLB was whether it was lawful for the NRC Staff to assume that workers would incur radiation doses in excess of occupational exposure limits in the course of restoring water to spent fuel pools, *for the sole purposes of depressing accident probability estimates and thereby avoiding the preparation of an EIS. See* Detailed Summary at 31-38. NEPA mandates that the answer to this question is a resounding "no." Because they may have a significant adverse impact on human health, radiation exposures to workers that are above normal occupational limits constitute significant adverse impacts that must be considered in an EIS.

2. The ASLB's decision was arbitrary and capricious because it relied on nonexistent calculations.

In LBP-01-09 the ASLB declared that the Staff's conclusion with respect to the extremely low probability of Step 5 was "supported by CP&L's detailed evaluation." 53 NRC at 263. In summarizing CP&L's evidentiary presentation regarding Step 5, the ASLB also uncritically asserted that CP&L expert Benjamin Morgan "calculated accessibility to in-plant areas," and that "Mr. Morgan indicated the results of these calculations show that various areas of the plant to which access would be necessary after the postulated accident would be reachable to perform activities to provide SFP cooling or makeup." 53 NRC at 261. These conclusions

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only justified "for life saving activities and the protection of large populations." *Id.* at 2-11.

with respect to the adequacy of CP&L's calculations for Event 5 apply by implication to Event 4, because the dose calculations in Step 5 are based on the radiation level calculations in Step 4.

The record is devoid of any factual basis for the ASLB's confidence in CP&L's analysis. As the ASLB was well aware, CP&L did not submit a single calculation or piece of data regarding either the levels of radiation that would be experienced at the Harris site in the aftermath of a degraded core accident with containment bypass (step 4), or the radiation doses that workers would receive (step 5). This was pointed out by Orange County's attorney during the oral argument, and confirmed by CP&L's attorney. *See* Arg. Tr. at 476, 596. The only information submitted by CP&L consisted of Mr. Morgan's unsupported and conclusory assertions that doses would be acceptable. Thus, for purposes of the Supart K proceeding, no calculations existed on which the ASLB could have relied for support of the NRC Staff's position with respect to Step 5.[24] Moreover, the ASLB had no factual basis for reporting that CP&L had performed "calculations of radiation levels" at Step 4, a necessary predicate to completing Step 5. *See* 53 NRC at 259.

Not once did the ASLB mention the fact that CP&L failed to submit any data that would support CP&L's generalized assertions regarding the probability of Events 4 and 5. Instead, the ASLB reported that CP&L had performed "calculations," thus giving the distinct impression that

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24 The ASLB attempted to buttress the credibility of CP&L's analysis by claiming that it was subjected to a "peer review-type process." 53 NRC at 268-69. *See also* CLI-01-11, 53 NRC at 389 ("Notably, as the Board stressed, the NRC Staff and CP&L subjected their analytical work to peer review.") NRC procedural guidelines for PRA preparation, however, require that a PRA must provide sufficient information so that its calculations can be reproduced by an independent reviewer. *See* Arg. Tr. at 471, 686-87. Peer review of CP&L's analysis for Steps 4 and 5 was impossible here, because no data was provided. *Id.* Moreover, the alleged peer review was performed by employees of the same company that prepared the PRA, and CP&L provided no information that the reviewers had not participated in the preparation of the PRA itself. Arg. Tr. at 687-89.

such calculations existed. The ASLB also generalized about CP&L's "PRA-enhanced analysis" as "beneficial, although not dispositive, confirmation of the validity of the Staff's analysis to the degree the CP&L analysis yielded a probability estimate that was equal to or lower than the Staff's estimate." 53 NRC at 252.

Steps 4 and 5 of the accident scenario, regarding the onsite radiation levels and doses that workers might experience if they try to restore water to the fuel pools, are complex steps in the accident analysis that involve significant controversy between Orange County and the NRC Staff. To state that CP&L performed calculations that supported the Staff, without ever having seen a single calculation, constituted the height of capricious decisionmaking. Moreover, if permitted to stand uncorrected, such misleading claims about the adequacy of an environmental analysis "can defeat the first function of an EIS by impairing the agency's consideration of the adverse environmental effects of a proposed project." *Hughes River Watershed Conservancy v. Glickman,* 81 F.3d 437, 446 (4th Cir. 1996) (rejecting EIS that contained misleading projects of a project's economic benefits). *See also South Louisiana Environmental Council, Inc. v. Sand,* 629 F.2d 1005, 1011-12 (5th Cir. 1980); *Johnston v. Davis,* 698 F.2d 1088, 1094-95 (10th Cir. 1983).

E. The NRCs Determination Of No Significant Hazards Considerations Was Arbitrary And Capricious And Violated NEPA.

1. The NSH Determination is invalid because it failed to respond to comments by Orange County.

As discussed above in Section V.A.2, a proposed determination of no significant hazards considerations must be published for comment in the Federal Register before it can be made final. As the U.S. Court of Appeals has recognized, the opportunity to comment on a proposed agency decision is "meaningless unless the agency responds to significant points raised by the

public." *St. James Hospital v. Heckler,* 760 F.2d 1460, 1470 (7th Cir.), *cert. denied,* 474 U.S. 902 (1985), *quoting Home Box Office v. FCC,* 566 F.2d 9, 35-36 (D.C. Cir.), *cert. denied,* 434 U.S. 829 (1977). In its final determination of no significant hazards considerations, the NRC Staff did not even mention Orange County's comments, let alone respond to them. On this basis alone, the decision is arbitrary and capricious and must be reversed.

2. The NSH Determination violated NRC's own regulations.

In making a NSH Determination, the NRC must follow its own regulations. *San Luis Obispo Mothers for Peace v. NRC*, 799 F.2d 1268 (9th Cir. 1986). The NRC's NSH regulations preclude the making of a NSH Determination if there is a "possibility" of a new or different kind of accident that has not been considered before. 10 C.F.R. § 50.92(c)(2).

At the time that the Staff issued the final NSH Determination, Orange County's environmental contention was pending before the ASLB. By admitting the contention in LBP-00-19, the ASLB had established, as a matter of law, the potential for a credible accident scenario, never before considered by the NRC, that could cause a severe accident at the Harris nuclear power plant. Unless and until the ASLB determined that this potential was not, in fact, credible, the NRC was bound by it. In effect, LBP-00-19 established, as a matter of law, that a NSH Determination could not be issued due to the "possibility" of a new kind of accident that had never before been considered. *San Luis Obispo Mothers for Peace v. U.S. NRC*, 799 F.2d at 1271 (finding that NRC's own statements conceding the possibility of a new and different kind of action precluded issuance of No Significant Hazards Consideration, regardless of NRC's conclusion that the accident was unlikely). Thus, the NSH Determination must be reversed.

3. The NSH Determination violated NEPA.

It is a cardinal principle of NEPA that the environmental consequences of a proposed federal action must be considered *before* it goes forward, not afterwards. *Robertson v. Methow, supra,* 490 U.S. at 349. At the time the staff issued the NSHC determination, the ASLB was in the course of considering whether the proposed Harris license amendment posed a foreseeable risk of a severe pool accident, such that an EIS should be prepared. Thus, the question of whether the proposed amendment would require an EIS was still open. It was patently illegal for the NRC Staff to issue a license amendment to CP&L before this determination had been made.

F. If The Court Reverses LBP-00-19 And/Or LBP-01-09, The NSH Determination Will Be Ripe For Review.[25]

As the NRC has acknowledged, if Orange County prevails in its appeal, the validity of the NSH Determation will "regain significance." Federal Respondents' Opposition to Petitioner's Motion to Reactivate and Consolidate and Motion to Dismiss or Alternatively, to Continue in Abeyance at 7 (July 23, 2001) (hereinafter "NRC Motion"). However, the agency maintains that the NSHC Determination is not ripe. The NRC bases this argument on the fact that, although the NRC Commissioners denied Orange County's petition for review, they left open the possibility that they might take review of the No Significant Hazards Determination on their own initiative and reverse it. *Id.* at 6-7. Contrary to the Commission's argument, this case meets the judicial test of ripeness.

As this Court has held, "[r]ipeness depends on 'the fitness of the issues for judicial decision and the hardship to the parties of withholding court consideration." *Burlington Northern R. Co. v. Surface Transportation Board,* 75 F.3d 685, 691 (D.C. Cir. 1996), *quoting*

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25 In an October 22, 2001, order consolidating Nos. 01-1073 and 01-1246, the Court

Abbot Laboratories v. Gardner, 387 U.S. 136, 149 (1967). This case meets both prongs of the test. [26]

The courts typically find cases fit for judicial review where "[p]urely legal" questions are involved. In addition, the courts examine whether the agency's policy has "crystallized," or whether "there may be some other material institutional advantage from deferring review." *Id.* As discussed above in Section E, the primary issue here is legal: whether a decision by the ASLB precluded, as a matter of law, the issuance of a NSH Determination. Moreover, the agency decisionmaking process "crystallized" with the issuance of the NSH Determination. The decision became immediately effective and final upon issuance. 10 C.F.R. § 50.58(b)(6). The regulations provided no right of administrative appeal or even the opportunity for a petition for review, and review by the Commissioners was completely discretionary. *Id.* While the Commission subsequently speculated in CLI-01-07 that it *might* undertake review of the decision, it never made a commitment to do so, nor did it act on the additional information that it requested from the NRC Staff in CLI-01-07. The Court should not withhold review based on mere speculation that the decision might change in the future. *See Appalachian Power Co. v EPA,* 208 F.3d 1015, 1023 (D.C. Cir. 2000) ("The fact that a law may be altered in the future has

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directed the parties to address issues presented in motions to dismiss No. 01-1073.

26 *New York State Electric & Gas Corp. v. FERC,* 177 F.3d 1037, 1040 (D.C. Cir. 1999); and *DRG Funding Corp. v. HUD,* 76 F.3d 1212, 1215 (D.C. Cir. 1996), do not support the NRC's argument. NRC Motion at 7. In *New York State,* the Court found that an appeal of a FERC decision establishing a legal presumption was unripe because the presumption had not yet been applied by the agency in any administrative proceeding; in fact, no such proceeding had even been requested. 177 F.2d at 1040. In contrast, in this case, the administrative action, issuance of the CP&L license amendment before completion of the hearing, has already "come to pass." *Id.* No further action is necessary to put it into effect. *DRG Funding Corp.* is simply inapplicable, because it concerns the question of finality rather than ripeness. The NRC has not contested the finality of the NSH Determination as an immediately effective decision by the Commission.

nothing to do with whether it is subject to judicial review.")

Moreover, to withhold review until some unspecified time in the future when the NRC decides whether or not to take review of the No Significant Hazards Determination would impose a hardship on Orange County. The immediate and unjustified issuance of the operating license amendment to CP&L caused an injury to Orange County by allowing CP&L to make dangerous changes to the plant's operation before completion of the adjudicatory proceeding on the safety and environmental risks of the amendment. Orange County has no redress for that injury other than its recourse to this Court.

VIII. CONCLUSION AND REQUEST FOR RELIEF

For the foregoing reasons, Orange County requests the Court to reverse and remand LBP-00-19, LBP-01-09, and the NRC Staff's NSH Determination. The Court should hold that the NRC failed to satisfy its burden of proving that no EIS was required in this case, and order the agency to prepare an EIS. In the alternative, the Court should order the hearing to be reopened and to proceed to a trial.

Respectfully submitted,

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March 27, 2002

ADDENDUM

PERTINENT STATUTES AND REGULATIONS

Statutes

Atomic Energy Act, 42 U.S.C. § 2239(a)(1)
(hearing provision and Sholly Amendment) ADD-1

National Environmental Policy Act, 42 U.S.C. 4332 ..... ADD-3

Nuclear Waste Policy Act, 42 U.S.C. § 10154 ..... ADD-5

Regulations

10 C.F.R. § 2.714(b) ADD-7

10 C.F.R. Part 2, Subpart K ADD-8

10 C.F.R. § 20.1201(a)(1) ADD-10

10 C.F.R. § 50.58(b)(6) ADD-11

10 C.F.R. § 50.92(c) ADD-12

40 C.F.R. § 1502.22(b)(1) ADD-13

ATOMIC ENERGY ACT AND SHOLLY AMENDMENT, 42 U.S.C. § 2239(a)

Section 2239. Hearings and judicial review

(a)(1)(A) In any proceeding under this chapter, for the granting, suspending, revoking, or amending of any license or construction permit, or application to transfer control, and in any proceeding for the issuance or modification of rules and regulations dealing with the activities of licensees, and in any proceeding for the payment of compensation, an award or royalties under sections (FOOTNOTE 1) 2183, 2187, 2236(c) or 2238 of this title, the Commission shall grant a hearing upon the request of any person whose interest may be affected by the proceeding, and shall admit any such person as a party to such proceeding. The Commission shall hold a hearing after thirty days' notice and publication once in the Federal Register, on each application under section 2133 or 2134(b) of this title for a construction permit for a facility, and on any application under section 2134(c) of this title for a construction permit for a testing facility. In cases where such a construction permit has been issued following the holding of such a hearing, the Commission may, in the absence of a request therefor by any person whose interest may be affected, issue an operating license or an amendment to a construction permit or an amendment to an operating license without a hearing, but upon thirty days' notice and publication once in the Federal Register of its intent to do so. The Commission may dispense with such thirty days' notice and publication with respect to any application for an amendment to a construction permit or an amendment to an operating license upon a determination by the Commission that the amendment involves no significant hazards consideration.

(FOOTNOTE 1) So in original. Probably should be "section".

(B)(i) Not less than 180 days before the date scheduled for initial loading of fuel into a plant by a licensee that has been issued a combined construction permit and operating license under section 2235(b) of this title, the Commission shall publish in the Federal Register notice of intended operation. That notice shall provide that any person whose interest may be affected by operation of the plant, may within 60 days request the Commission to hold a hearing on whether the facility as constructed complies, or on completion will comply, with the acceptance criteria of the license.

(ii) A request for hearing under clause (i) shall show, prima facie, that one or more of the acceptance criteria in the combined license have not been, or will not be met, and the specific operational consequences of nonconformance that would be contrary to providing reasonable assurance of adequate protection of the public health and safety.

(iii) After receiving a request for a hearing under clause (i), the Commission expeditiously shall either deny or grant the request. If the request is granted, the Commission shall determine, after considering petitioners' prima facie showing and any answers thereto, whether during a period of interim operation, there will be reasonable assurance of adequate protection of the public health and safety. If the Commission determines that there is such reasonable assurance, it shall allow operation during an

interim period under the combined license.

(iv) The Commission, in its discretion, shall determine appropriate hearing procedures, whether informal or formal adjudicatory, for any hearing under clause (i), and shall state its reasons therefor.

(v) The Commission shall, to the maximum possible extent, render a decision on issues raised by the hearing request within 180 days of the publication of the notice provided by clause (i) or the anticipated date for initial loading of fuel into the reactor, whichever is later. Commencement of operation under a combined license is not subject to subparagraph (A).

(2)(A) The Commission may issue and make immediately effective any amendment to an operating license or any amendment to a combined construction and operating license, upon a determination by the Commission that such amendment involves no significant hazards consideration, notwithstanding the pendency before the Commission of a request for a hearing from any person. Such amendment may be issued and made immediately effective in advance of the holding and completion of any required hearing. In determining under this section whether such amendment involves no significant hazards consideration, the Commission shall consult with the State in which the facility involved is located. In all other respects such amendment shall meet the requirements of this chapter.

(B) The Commission shall periodically (but not less frequently than once every thirty days) publish notice of any amendments issued, or proposed to be issued, as provided in subparagraph (A). Each such notice shall include all amendments issued, or proposed to be issued, since the date of publication of the last such periodic notice. Such notice shall, with respect to each amendment or proposed amendment (i) identify the facility involved; and (ii) provide a brief description of such amendment. Nothing in this subsection shall be construed to delay the effective date of any amendment.

(C) The Commission shall, during the ninety-day period following the effective date of this paragraph, promulgate regulations establishing (i) standards for determining whether any amendment to an operating license or any amendment to a combined construction and operating license involves no significant hazards consideration; (ii) criteria for providing or, in emergency situations, dispensing with prior notice and reasonable opportunity for public comment on any such determination, which criteria shall take into account the exigency of the need for the amendment involved; and (iii) procedures for consultation on any such determination with the State in which the facility involved is located.

NATIONAL ENVIRONMENTAL POLICY ACT, 42 U.S.C. §§ 4321 and 4332

Section 4321. Congressional declaration of purpose

The purposes of this chapter are: To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.

Section 4332. Cooperation of agencies; reports; availability of information; recommendations; international and national coordination of efforts

The Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this chapter, and (2) all agencies of the Federal Government shall -

(A) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment;

(B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by subchapter II of this chapter, which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations;

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on -

(i) the environmental impact of the proposed action,

(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,

(iii) alternatives to the proposed action,

(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public as provided by section 552 of title 5, and

shall accompany the proposal through the existing agency review processes;

(D) Any detailed statement required under subparagraph (C) after January 1, 1970, for any major Federal action funded under a program of grants to States shall not be deemed to be legally insufficient solely by reason of having been prepared by a State agency or official, if:

(i) the State agency or official has statewide jurisdiction and has the responsibility for such action,

(ii) the responsible Federal official furnishes guidance and participates in such preparation,

(iii) the responsible Federal official independently evaluates such statement prior to its approval and adoption, and

(iv) after January 1, 1976, the responsible Federal official provides early notification to, and solicits the views of, any other State or any Federal land management entity of any action or any alternative thereto which may have significant impacts upon such State or affected Federal land management entity and, if there is any disagreement on such impacts, prepares a written assessment of such impacts and views for incorporation into such detailed statement.

The procedures in this subparagraph shall not relieve the Federal official of his responsibilities for the scope, objectivity, and content of the entire statement or of any other responsibility under this chapter; and further, this subparagraph does not affect the legal sufficiency of statements prepared by State agencies with less than statewide jurisdiction. (FOOTNOTE 1)

(FOOTNOTE 1) So in original. The period probably should be a semicolon.

(E) study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources;

(F) recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment;

(G) make available to States, counties, municipalities, institutions, and individuals, advice and information useful in restoring, maintaining, and enhancing the quality of the environment;

(H) initiate and utilize ecological information in the planning and development of resource-oriented projects; and

(I) assist the Council on Environmental Quality established by subchapter II of this chapter.

NUCLEAR WASTE POLICY ACT, 42 U.S.C. §§ 10152 AND 10154

Section 10152. Available capacity for interim storage of Spent nuclear fuel

The Secretary, the Commission, and other authorized Federal officials shall each take such actions as such official considers necessary to encourage and expedite the effective use of available storage, and necessary additional storage, at the site of each civilian nuclear power reactor consistent with -

(1) the protection of the public health and safety, and the environment;

(2) economic considerations;

(3) continued operation of such reactor;

(4) any applicable provisions of law; and

(5) the views of the population surrounding such reactor.

Section 10154. Licensing of facility expansions and transshipments

a) Oral argument

In any Commission hearing under section 189 of the Atomic Energy Act of 1954 (42 U.S.C. 2239) on an application for a license, or for an amendment to an existing license, filed after January 7, 1983, to expand the spent nuclear fuel storage capacity at the site of a civilian nuclear power reactor, through the use of high-density fuel storage racks, fuel rod compaction, the transshipment of spent nuclear fuel to another civilian nuclear power reactor within the same utility system, the construction of additional spent nuclear fuel pool capacity or dry storage capacity, or by other means, the Commission shall, at the request of any party, provide an opportunity for oral argument with respect to any matter which the Commission determines to be in controversy among the parties. The oral argument shall be preceded by such discovery procedures as the rules of the Commission shall provide. The Commission shall require each party, including the Commission staff, to submit in written form, at the time of the oral argument, a summary of the facts, data, and arguments upon which such party proposes to rely that are known at such time to such party. Only facts and data in the form of sworn testimony or written submission may be relied upon by the parties during oral argument. Of the materials that may be submitted by the parties during oral argument, the Commission shall only consider those facts and data that are submitted in the form of sworn testimony or written submission.

(b) Adjudicatory hearing

(1) At the conclusion of any oral argument under subsection (a) of this section, the Commission shall designate any disputed question of fact, together with any remaining questions of law, for resolution in an adjudicatory hearing only if it determines that -

(A) there is a genuine and substantial dispute of fact which can only be resolved with sufficient accuracy by the introduction of evidence in an adjudicatory hearing; and

(B) the decision of the Commission is likely to depend in whole or in part on the resolution of such dispute.

(2) In making a determination under this subsection, the Commission -

(A) shall designate in writing the specific facts that are in genuine and substantial dispute, the reason why the decision of the agency is likely to depend on the resolution of such facts, and the reason why an adjudicatory hearing is likely to resolve the dispute; and

(B) shall not consider -

(i) any issue relating to the design, construction, or operation of any civilian nuclear power reactor already licensed to operate at such site, or any civilian nuclear power reactor for which a construction permit has been granted at such site, unless the Commission determines that any such issue substantially affects the design, construction, or operation of the facility or activity for which such license application, authorization, or amendment is being considered; or

(ii) any siting or design issue fully considered and decided by the Commission in connection with the issuance of a construction permit or operating license for a civilian nuclear power reactor at such site, unless (I) such issue results from any revision of siting or design criteria by the Commission following such decision; and (II) the Commission determines that such issue substantially affects the design, construction, or operation of the facility or activity for which such license application, authorization, or amendment is being considered.

(3) The provisions of paragraph (2)(B) shall apply only with respect to licenses, authorizations, or amendments to licenses or authorizations, applied for under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) before December 31, 2005.

(4) The provisions of this section shall not apply to the first application for a license or license amendment received by the Commission to expand onsite spent fuel storage capacity by the use of a new technology not previously approved for use at any nuclear powerplant by the Commission.

(c) Judicial review

No court shall hold unlawful or set aside a decision of the Commission in any proceeding described in subsection (a) of this section because of a failure by the Commission to use a particular procedure pursuant to this section unless -

(1) an objection to the procedure used was presented to the Commission in a timely fashion or there are extraordinary circumstances that excuse the failure to present a timely objection; and

(2) the court finds that such failure has precluded a fair consideration and informed resolution of a significant issue of the proceeding taken as a whole.

54 FR 33168

(b)(1) Not later than fifteen (15) days prior to the holding of the special prehearing conference pursuant to § 2.751a, or if no special prehearing conference is held, fifteen (15) days prior to the holding of the first prehearing conference, the petitioner shall file a supplement to his or her petition to intervene that must include a list of the contentions which petitioner seeks to have litigated in the hearing. A petitioner who fails to file a supplement that satisfies the requirements of paragraph (b)(2) of this section with respect to at least one contention will not be permitted to participate as a party. Additional time for filing the supplement may be granted based upon a balancing of the factors in paragraph (a)(1) of this section.

(2) Each contention must consist of a specific statement of the issue of law or fact to be raised or controverted. In addition, the petitioner shall provide the following information with respect to each contention:

(i) A brief explanation of the bases of the contention.

(ii) A concise statement of the alleged facts or expert opinion which support the contention and on which the petitioner intends to rely in proving the contention at the hearing, together with references to those specific sources and documents of which the petitioner is aware and on which the petitioner intends to rely to establish those facts or expert opinion.

54 FR 33168

(iii) Sufficient information (which may include information pursuant to paragraphs (b)(2)(i) and (ii) of this section) to show that a genuine dispute exists with the applicant on a material issue of law or fact. This showing must include references to the specific portions of the application (including the applicant's environmental report and safety report) that the petitioner disputes and the supporting reasons for each dispute, or, if the petitioner believes that the application fails to contain information on a relevant matter as required by law, the identification of each failure and the supporting reasons for the petitioner's belief. On issues arising under the National Environmental Policy Act, the petitioner shall file contentions based on the applicant's environmental report. The petitioner can amend those contentions or file new contentions if there are data or conclusions in the NRC draft or final environmental impact statement, environmental assessment, or any supplements relating thereto, that differ significantly from the data or conclusions in the applicant's document.

Subpart K—Hybrid Hearing Procedures for Expansion of Spent Nuclear Fuel Storage Capacity at Civilian Nuclear Power Reactors

50 FR 41662

§ 2.1101 Purpose.

The regulations in this subpart establish hybrid hearing procedures, as authorized by section 134 of the Nuclear Waste Policy Act of 1982 (96 Stat. 2230), to be used at the request of any party in certain contested proceedings on applications for a license or license amendment to expand the spent nuclear fuel storage capacity at the site of a civilian nuclear power plant. These procedures are intended to encourage and expedite onsite expansion of spent nuclear fuel storage capacity.

63 FR 66721

§ 2.1103 Scope.

The procedures in this subpart apply to contested proceedings on applications filed after January 7, 1983, for a license or license amendment under Part 50 of this chapter, to expand the spent fuel storage capacity at the site of a civilian nuclear power plant, through the use of high density fuel storage racks, fuel rod compaction, the transshipment of spent nuclear fuel to another civilian nuclear power reactor within the same utility system, the construction of additional spent nuclear fuel pool capacity or dry storage capacity, or by other means. This subpart also applies to proceedings on applications for a license under Part 72 of this chapter to store spent nuclear fuel in an independent spent fuel storage installation located at the site of a civilian nuclear power reactor. This subpart shall not apply to the first application for a license or license amendment to expand the spent fuel storage capacity at a particular site through the use of a new technology not previously approved by the Commission for use at any other nuclear power plant. This subpart shall not apply to proceedings on applications for transfer of a license issued under Part 72 of this chapter. Subpart M of this part applies to license transfer proceedings.

50 FR 41662

§ 2.1105 Definitions.

As used in this part:

(a) "Civilian nuclear power reactor" means a civilian nuclear power plant required to be licensed as a utilization facility under section 103 or 104(b) of the Atomic Energy Act of 1954.

(b) "Spent nuclear fuel" means fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing.

§ 2.1107 Notice of proposed action.

In connection with each application filed after January 7, 1983, for a license or an amendment to a license to expand the spent nuclear fuel storage capacity at the site of a civilian nuclear power plant, for which the Commission has not found that a hearing is required in the public interest, for which an adjudicatory hearing has not yet been convened, and for which a notice of proposed action has not yet been published as of the effective date of this subpart, the Commission will, prior to acting thereon, cause to be published in the **Federal Register** a notice of proposed action in accordance with § 2.105. The notice of proposed action will identify the availability of the hybrid hearing procedures in this subpart, specify that any party may invoke these procedures by filing a timely request for oral argument under § 2.1109, and provide that if a request for oral argument is granted, any hearing held on the application shall be conducted in accordance with the procedures in this subpart.

§ 2.1109 Requests for oral argument.

(a)(1) Within ten (10) days after an order granting a request for hearing or petition for leave to intervene, any party may invoke the hybrid hearing procedures in this subpart by requesting an oral argument. Requests for oral argument shall be in writing and shall be filed with the presiding officer. The

presiding officer shall grant a timely request for oral argument.

(2) The presiding officer may grant an untimely request for oral argument only upon a showing of good cause by the requesting party for failure to file on time and after providing the other parties an opportunity to respond to the untimely request.

(b) The presiding officer shall issue a written order ruling on any requests for oral argument. If the presiding officer grants a request for oral argument, the order shall include a schedule for discovery and subsequent oral argument with respect to the admitted contentions.

(c) If no party to the proceeding requests oral argument, or if all untimely requests for oral argument are denied, the presiding officer shall conduct the proceeding in accordance with Subpart G of 10 CFR Part 2.

50 FR 41662

§ 2.1111 Discovery.

Discovery shall begin and end at such times as the presiding officer shall order. It is expected that all discovery shall be completed within 90 days. The presiding officer may extend the time for discovery upon good cause shown based on exceptional circumstances and after providing the other parties an opportunity to respond to the request.

§ 2.1113 Oral argument.

(a) Fifteen (15) days prior to the date set for oral argument, each party, including the NRC staff, shall submit to the presiding officer a detailed written summary of all the facts, data, and arguments which are known to the party at such time and on which the party proposes to rely at the oral argument either to support or to refute the existence of a genuine and substantial dispute of fact. Each party shall also submit all supporting facts and data in the form of sworn written testimony or other sworn written submission. Each party's written summary and supporting information shall be simultaneously served on all other parties to the proceeding.

(b) Only facts and data in the form of sworn written testimony or other sworn written submission may be relied on by the parties during oral argument, and the presiding officer shall consider those facts and data only if they are submitted in that form.

50 FR 41662

§ 2.1115 Designation of issues for adjudicatory hearing.

(a) After due consideration of the oral presentation and the written facts and data submitted by the parties and relied on at the oral argument , the presiding officer shall promptly by written order:

(1) Designate any disputed issues of fact, together with any remaining issues of law, for resolution in an adjudicatory hearing; and

(2) Dispose of any issues of law or fact not designated for resolution in an adjudicatory hearing.

With regard to each issue designated for resolution in an adjudicatory hearing, the presiding officer shall identify the specific facts that are in genuine and substantial dispute, the reason why the decision of the Commission is likely to depend on the resolution of that dispute, and the reason why an adjudicatory hearing is likely to resolve the dispute. With regard to issues not designated for resolution in an adjudicatory hearing, the presiding officer shall include a brief statement of the reasons for the disposition. If the presiding officer finds that there are no disputed issues of fact or law requiring resolution in an adjudicatory hearing, the presiding officer shall also dismiss the proceeding.

(b) No issue of law or fact shall be designated for resolution in an adjudicatory hearing unless the presiding officer determines that:

(1) There is a genuine and substantial dispute of fact which can only be resolved with sufficient accuracy by the introduction of evidence in an adjudicatory hearing; and

(2) The decision of the Commission is likely to depend in whole or in part on the resolution of that dispute.

(c) In making a determination under paragraph (b) of this section, the presiding officer shall not consider:

50 FR 41662

(1) Any issue relating to the design, construction, or operation of any civilian nuclear power reactor already licensed to operate at the site, or any civilian nuclear power reactor for which a construction permit has been granted at the site, unless the presiding officer determines that any such issue substantially affects the design, construction, or operation of the facility or activity for which a license application, authorization, or amendment to expand the spent nuclear fuel storage capacity is being considered; or

(2) Any siting or design issue fully considered and decided by the Commission in connection with the issuance of a construction permit or operating license for a civilian nuclear power reactor at that site, unless (i) such issue results from any revision of siting or design criteria by the Commission following such decision; and (ii) the presiding officer determines that such issue substantially affects the design, construction, or operation of the facility or activity for which a license application, authorization, or amendment to expand the spent nuclear fuel storage capacity is being considered.

(d) The provisions of paragraph (c) of this section shall apply only with respect to licenses, authorizations, or amendments to licenses or authorizations applied for under the Atomic Energy Act of 1954, as amended, before December 31, 2005.

(e) Unless the presiding officer disposes of all issues and dismisses the proceeding, appeals from the presiding officer's order disposing of issues and designating one or more issues for resolution in an adjudicatory hearing are interlocutory and must await the end of the proceeding.

§ 2.1117 Applicability of other sections.

In proceedings subject to this subpart, the provisions of Subparts A and G of 10 CFR Part 2 are also applicable, except where inconsistent with the provisions of this subpart.

Subpart C—Occupational Dose Limits

§ 20.1201 Occupational dose limits for adults.

56 FR 23360

(a) The licensee shall control the occupational dose to individual adults, except for planned special exposures under § 20.1206, to the following dose limits.

(1) An annual limit, which is the more limiting of—

(i) The total effective dose equivalent being equal to 5 rems (0.05 Sv); or

(ii) The sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to 50 rems (0.5 Sv).

(2) The annual limits to the lens of the eye, to the skin, and to the extremities, which are:

63 FR 39477

(i) A lens dose equivalent of 15 rems (0.15 Sv), and

56 FR 23360

(ii) A shallow-dose equivalent of 50 rems (0.50 Sv) to the skin or to any extremity.

(b) Doses received in excess of the annual limits, including doses received during accidents, emergencies, and planned special exposures, must be subtracted from the limits for planned special exposures that the individual may receive during the current year (see § 20.1206(e)(1)) and during the individual's lifetime (see § 20.1206(e)(2)).

63 FR 39477

(c) The assigned deep-dose equivalent and shallow-dose equivalent must be for the part of the body receiving the highest exposure. The deep-dose equivalent, lens dose equivalent, and shallow-dose equivalent may be assessed from surveys or other radiation measurements for the purpose of demonstrating compliance with the occupational dose limits, if the individual monitoring device was not in the region of highest potential exposure, or the results of individual monitoring are unavailable.

60 FR 20183

(d) Derived air concentration (DAC) and annual limit on intake (ALI) values are presented in table 1 of appendix B to part 20 and may be used to determine the individual's dose (see § 20.2106) and to demonstrate compliance with the occupational dose limits.

(e) In addition to the annual dose limits, the licensee shall limit the soluble uranium intake by an individual to 10 milligrams in a week in consideration of chemical toxicity (see footnote 3 of appendix B to part 20).

§ 50.58 Hearings and report of the Advisory Committee on Reactor Safeguards.

(a) Each application for a construction permit or an operating license for a facility which is of a type described in § 50.21(b) or § 50.22, or for a testing facility, shall be referred to the Advisory Committee on Reactor Safeguards for a review and report. An application for an amendment to such a construction permit or operating license may be referred to the Advisory Committee on Reactor Safeguards for review and report. Any report shall be made part of the record of the application and available to the public, except to the extent that security classification prevents disclosure.

39 FR 10554

(b)(1) The Commission will hold a hearing after at least 30-days' notice and publication once in the Federal Register on each application for a construction permit for a production or utilization facility which is of a type described in § 50.21(b) or § 50.22, or for a testing facility.

(2) When a construction permit has been issued for such a facility following the holding of a public hearing, and an application is made for an operating license or for an amendment to a construction permit or operating license, the Commission may hold a hearing after at least 30-days' notice and publication once in the Federal Register, or, in the absence of a request therefor by any person whose interest may be affected, may issue an operating license or an amendment to a construction permit or operating license without a hearing, upon 30-days' notice and publication once in the Federal Register of its intent to do so.

(3) If the Commission finds, in an emergency situation, as defined in § 50.91, that no significant hazards consideration is presented by an application for an amendment to an operating license, it may dispense with public notice and comment and may issue the amendment. If the Commission finds that exigent circumstances exist, as described in § 50.91, it may reduce the period provided for public notice and comment.

51 FR 7744

(4) Both in an emergency situation and in the case of exigent circumstances, the Commission will provide 30 days notice of opportunity for a hearing, though this notice may be published after issuance of the amendment if the Commission determines that no significant hazards consideration is involved.

(5) The Commission will use the standards in § 50.92 to determine whether a significant hazards consideration is presented by an amendment to an operating license for a facility of the type described in § 50.21(b) or § 50.22, or which is a testing facility, and may make the amendment immediately effective, notwithstanding the pendency before it of a request for a hearing from any person, in advance of the holding and completion of any required hearing, where it has determined that no significant hazards consideration is involved.

(6) No petition or other request for review of or hearing on the staff's significant hazards consideration determination will be entertained by the Commission. The staff's determination is final, subject only to the Commission's discretion, on its own initiative, to review the determination.

§ 50.92 Issuance of amendment.

(a) In determining whether an amendment to a license or construction permit will be issued to the applicant, the Commission will be guided by the considerations which govern the issuance of initial licenses or construction permits to the extent applicable and appropriate. If the application involves the material alteration of a licensed facility, a construction permit will be issued before the issuance of the amendment to the license. If the amendment involves a significant hazards consideration, the Commission will give notice of its proposed action (1) pursuant to §2.105 of this chapter before acting thereon and (2) as soon as practicable after the application has been docketed.

(b) The Commission will be particularly sensitive to a license amendment request that involves irreversible consequences (such as one that permits a significant increase in the amount of effluents or radiation emitted by a nuclear power plant).

(c) The Commission may make a final determination, pursuant to the procedures in §50.91, that a proposed amendment to an operating license for a facility licensed under §50.21(b) or §50.22 or for a testing facility involves no significant hazards consideration, if operation of the facility in accordance with the proposed amendment would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or

(2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or

(3) Involve a significant reduction in a margin of safety.

[51 FR 7767, Mar. 6, 1986]

§ 1502.22 Incomplete or unavailable information.

When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.

(a) If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.

(b) If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement:

(1) A statement that such information is incomplete or unavailable; (2) a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; (3) a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment, and (4) the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.

(c) The amended regulation will be applicable to all environmental impact statements for which a Notice of Intent (40 CFR 1508.22) is published in the FEDERAL REGISTER on or after May 27, 1986. For environmental impact statements in progress, agencies may choose to comply with the requirements of either the original or amended regulation.

[51 FR 15625, Apr. 25, 1986]

UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

ORANGE COUNTY, NORTH CAROLINA, Petitioner, v. UNITED STATES NUCLEAR REGULATORY COMMISSION and the UNITED STATES OF AMERICA, Respondents CAROLINA POWER & LIGHT Intervenor-Respondents	Nos. 01-1073, 01-1246 (Consolidated)

CERTIFICATE OF SERVICE

I certify that on March 27, 2002, copies of the foregoing Initial Brief for Petitioner Orange County were served on the Court and on the following parties by first-class mail:

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