

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )

DUKE POWER COMPANY, et al. )

(Catawba Nuclear Station,  
Units 1 and 2) )

Docket Nos. 50-413  
50-414

AFFIDAVIT OF MICHAEL C. GREEN REGARDING PALMETTO  
ALLIANCE CONTENTION 16

1. My name is Michael C. Green. I am employed by Duke Power Company as a Supervising Design Engineer. I have been employed in this position since June 1978. My professional qualifications are contained in an attachment to this affidavit.
2. My job responsibilities include structural analysis and design of several Catawba building structures and components, including the spent fuel pool and liner plate system. My familiarity with the issues discussed in this affidavit results from my association with the original and continual design of spent fuel pool and liner plate system.
3. The purpose of this affidavit is to address three questions which Palmetto Alliance has raised relating to Contention 16. The first deals with leakage of the spent fuel pool liner plate due to high temperatures. The second question deals with the possibility of a cask drop accident resulting in a fuel cask entering the spent fuel pool. The third question deals with applicants compliance with GDC 2 and GDC 4.

Reference liner plate leakage

4. I understand that Palmetto Alliance alleges that the spent fuel liner would "rupture" in the event the spent fuel pool temperatures exceed the 150° F

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for which the pool and liner are designed. The purpose of the liner plate is to contain water in the pool area. To allege that the liner plate "ruptures" is to assert that the liner could no longer perform its function of containing this water.

5. This allegation of Palmetto Alliance is incorrect. The liner plate system is constructed as follows:

(a) Steel plates and shapes embedded in the concrete surface of the pool;

(b) Stainless steel "liner" plates are continuously welded to the embedded plates and shapes, such that the entire concrete surface is covered by liner plate.

(c) Over each of these initial welds, an angle shape is placed. This angle is welded continuously and is referred to as "leak-chase angle."

6. For water to reach the surface of the concrete, and thereby leak out of the pool area, both the welds of the "liner" plate to the embedded plate and the welds of the "leak-chase angle" to the liner would have to fail. At a temperature of 212° F, the weld of the liner plate to the embedded plate or shape are postulated to fail. However, at the temperature of 212° F, the weld of the "leak-chase angle" to the liner plate remains intact. Thereby, the leak tight integrity of the spent fuel pool liner system is maintained.

7. As the previous paragraphs demonstrate, the water in the spent fuel pool will not reach the surface of the concrete, and thereby cannot leak to the environment, even if subjected to the temperature of 212° F. In any event, even if the liner plate did fail and water did come in contact with the concrete walls and floors, calculations indicate that a total outflow

through all of the cracks in the concrete surfaces of the fuel pool would be less than one-half ( $\frac{1}{2}$ ) gallon per day.

#### Reference Cask Drop

8. I understand that Palmetto Alliance alleges that a spent fuel cask can be dropped onto spent fuel assemblies stored in a spent fuel pool, thereby creating a "criticality" concern and a violation of General Design Criteria.
9. This allegation is incorrect. The spent fuel cask cannot be dropped into the spent fuel pool. Two cask drop incidents were postulated and examined. The first postulation assumes the fuel cask crane traveling at its maximum horizontal speed of 50 feet per minute, then impacting the stops located on the crane rail. This sudden stop of the crane would "swing" the cask towards the wall that separates the cask pit from the fuel pool proper. This calculation further assumes that the cables break when the cask reaches its maximum horizontal displacement. From this position, basic laws of motion and momentum are used to show that the cask will not "flip" over this wall into the pool, but would rather fall back into the cask pit.
10. The second calculation examines the possibility of a cask being dropped on the wall that separates the decontamination pit from the cask pit, possibly tipping over the cask pit, impacting the wall that separates the cask pit from the fuel pool proper, and finally "flipping" into the pool. Again, this calculation assumes the maximum speed of the crane, thus providing the greatest momentum of the cask prior to its release. Once again, basic laws of momentum prove this postulation to be impossible.
11. On the basis of the above calculations the "criticality" requirement of GDC 62 is satisfied.

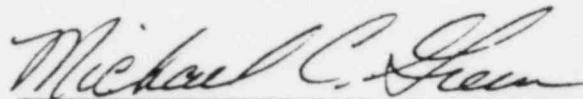
12. Palmetto Alliance raises a point during depositions taken on May 12, 1983 regarding the extension of crane rails out over the spent fuel pool. It is true that during the construction phase of Catawba the rails associated with the 125 ton cask lifting crane were extended out over the spent fuel pool. This extension was done to accommodate construction sequences of the pool. However, prior to operation of the plant, the stops associated with the cask handling crane will be located such that the rail extension over the fuel pool cannot be utilized by the cask handling crane, thereby prohibiting the cask from ever being located over the fuel pool area. (Reference Pages 86-88 of the transcripts of the May 12, 1983 deposition.)

GDC 2 and GDC 4

13. The spent fuel pool design meets GDC 2 and GDC 4. See FSAR Section 3.1. I would note that GDC 2 and GDC 4 do not require consideration of aircraft crashes. Design requirements for spent fuel pools are given in Regulatory Guide 1.13. This Guide does not require consideration of aircraft crashes.



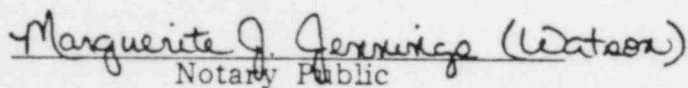
I, Michael C. Green, of lawful age, being first duly sworn, state that I have reviewed the foregoing affidavit and that the statements contained therein are true and correct to the best of my knowledge and belief.



Michael C. Green

STATE OF NORTH CAROLINA  
County of Mecklenburg

Subscribed and sworn to me this  
8th day of July, 1983.

  
Notary Public

My Commission expires: 8-1-84

MICHAEL CHARLES GREEN

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Member ASCE  
President Elect - N.C. Section of ASCE 1982-1983  
Vice President - N.C. Section of ASCE 1981 1982  
President - Southern Branch of N.C. Section of ASCE 1980-1981  
Vice President - Southern Branch of N.C. Section of ASCE 1979-1980  
Chairman of Membership Committee - Southern Branch 1978-1979  
Chairman of Seminar on Hydro Electric Pump Storage - Joint Power  
Generation Conference - St. Louis 1981

ADDITIONAL  
TRAINING:

TECHNICAL

- 1) Various STRUDL/DYNAL Seminars
- 2) Foundation Engineering Seminars
- 3) Geotechnical Seminars
- 4) ACI Code Seminars
- 5) Tornado Missile Impact Seminars  
(ASCE Structural Convention)
- 6) Engineering Economics Seminars

MANAGEMENT  
SEMINARS

- 1) Aberrant Behavior Training
- 2) Controlling Absenteeism
- 3) Effective Interviewing
- 4) Effective Management
- 5) Management Development
- 6) Advanced Management Development
- 7) Productivity Seminars
- 8) Time Management
- 9) Space Allocation
- 10) Interviewing Techniques

WORK  
EXPERIENCE: (All with Duke Power)

<u>FROM</u>	<u>TO</u>	<u>TITLE</u>	<u>PROGRAM</u>
6/76	Present	Assistant Design Engineer (6/76 to 6/78)	Oconee Nuclear Station
		Supervising Design Engineer (6/78 to Present)	Catawba Nuclear Station Bad Creek Project

In charge of engineering subgroup responsible for the structural analysis and design of various aspects of the Oconee Nuclear Station, Catawba Nuclear Station, and the Bad Creek Pumped Storage Facility.

Oconee

In responsible charge of the initial analysis and design of the Standby Shutdown Facility. The responsibilities included the preparation of the excavation

# WORK EXPERIENCE (CONTINUED)

FROM	TO	TITLE	PROGRAM
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6/76	Present (continued)		
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specification (which included blasting near the operating Reactor Building) as well as the static and dynamic analyses of the structure itself.

## Catawba

The responsibilities at Catawba included the structural analysis and design of the Auxiliary Building, the Spent Fuel Pool Buildings, the New Fuel Buildings, the Diesel Generator Buildings, the Upper Head Injection Buildings, the Auxiliary Service Building as well as various yard structures. Analysis requirements included both static and dynamic considerations, including earthquake, tornado, missile impacts, pipe whip and jet impingements. Responsibilities at Catawba also included the analysis and design of various internals to the above mentioned buildings; i.e., Spent Fuel Storage Racks, New Fuel Storage Racks, various equipment supports, and miscellaneous platforms, etc...

Duties required by these responsibilities include the development of calculations, specifications, and drawings as appropriate. Duties also included vendor contact, interfacing with the NRC regarding the licensing effort as well as the day-to-day interfacing with Construction Department personnel.

## Bad Creek

The responsibilities of the subgroup regarding the Bad Creek Project center primarily on the underground configuration of the intake, tailrace and access tunnels as well as the powerhouse chamber orientation. A "pilot" tunnel was driven to determine characteristics of the rock, with the results of these tests being used in the final design of the underground excavation.

Other duties pertaining to Bad Creek included the overall department scheduling, annual cost estimate preparation, and interfacing with the FERC in the licensing efforts.

Supervise from 7 to 14 engineers in this time period.

12/73	6/76	Engineer Associate	Catawba
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Responsible for the analysis and design of specific items pertaining to the Catawba Nuclear Station. Designs included: a) Groundwater drainage system; b) Frame analyses of the Auxiliary Building; c) Dynamic amplification factor determination from pipe whip transients; d) Miscellaneous equipment supports, stairs, platforms, etc. -

6/72	12/73	Junior Engineer	Belews Creek
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Responsible for various designs relating to the Belews Creek Coal Fired Station including: a) Transformer bases; b) Switchyard bases; c) Conduit Manholes; d) Sewage Treatment Structures; e) Fuel Oil Storage Area; f) Miscellaneous Equipment Supports.

RELATED CORRESPONDENCE

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD



In the Matter of )  
DUKE POWER COMPANY; et al. )  
(Catawba Nuclear Station, )  
Units 1 and 2) )

Docket Nos. 50-413  
50-414

ARGUMENT AND DOCUMENTATION IN SUPPORT OF  
MOTION FOR SUMMARY DISPOSITION ON PALMETTO  
ALLIANCE CONTENTION 44/CESG CONTENTION 18<sup>1</sup>

I. The Contention

Intervenors' Contention 18/44 questions the adequacy of, and Applicants' potential future compliance with, Commission regulations regarding fracture toughness of the Catawba reactor vessel. It reads as follows:

The license should not issue because reactor degradation in the form of a much more rapid increase in reference temperature than had been anticipated has occurred at a number of PWR's including Applicant's Oconee Unit 1. Until and unless the NRC and the industry can avoid reactor embrittlement, Catawba should not be permitted to operate.

This contention was originally rejected by the Licensing Board "for lack of the requisite specificity" in that, inter alia, "[t]here is no claim that components of the Catawba reactors do not meet reference temperature requirements." March 5, 1982 Licensing Board Order at p. 35. Subsequently,

<sup>1</sup> CESG Contention 18 and Palmetto Alliance Contention 44 (hereinafter "Intervenors' Contention 18/44") are identical. By order of June 20, 1983, this Licensing Board ruled that "[s]ince Palmetto Alliance's and CESG's information about and interest in this [contention] are, by Palmetto's own admission, identical, we are, in the interest of more efficient hearing management, consolidating the two intervenors with regard to Contention 44, and are designating CESG as lead intervenor on this contention." June 20 Board Order at p. 17.

after Intervenor provided additional specificity,<sup>2</sup> by Order of July 8, 1983 (at p. 12) the Licensing Board admitted this contention. In response to interrogatories, Intervenor make clear that the sole Commission "reference temperature requirement" which Applicants may not meet (and upon which this contention is therefore based) is that set forth in "Appendix H, Section II.C.3.a re adjusted reference temperature not exceeding 100°F." CESG's Responses to NRC Staff's Second Set of Interrogatories and Document Production Requests at p. 9 (March 17, 1983) ("Intervenor's March 17 Responses to Staff Interrogatories").<sup>3</sup> Further, in other responses Intervenor state that with regard to other fracture toughness requirements, Intervenor "challenge the sufficiency" of the standards set forth in Appendices G and H to 10 CFR Part 50. Id.

In short, in the context of unanticipated increases in the reference temperature, by their Contention 18/44, Intervenor seek to litigate in this proceeding not only Applicants' compliance with Section II.C.3.a of Appendix H of 10 CFR Part 50, but also the adequacy of Commission regulations set forth in Appendices G and H of 10 CFR Part 50. As set forth more fully below, Applicants maintain that with regard to this contention there are no issues of material fact appropriate for resolution in this proceeding, and accordingly, Applicants' motion for summary judgment should be granted.

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<sup>2</sup> Palmetto Alliance and Carolina Environmental Study Group Responses and Objections to Order Following Prehearing Conference at pp. 25-6 (March 31, 1982).

<sup>3</sup> These responses were adopted by Palmetto Alliance in its April 19, 1983 Supplemental Responses to Applicant's and Staff's Interrogatories 6, 7, 8, 16, 27 and 44 at pp. 64-65.

II. Material Facts As to Which There Is No Genuine Issue to Be Heard

A. By order of June 20, 1983, this Licensing Board ruled that "[s]ince Palmetto Alliance's and CESC's information about and interest in this [contention] are, by Palmetto's own admission, identical, we are, in the interest of more efficient hearing management, consolidating the two intervenors with regard to Contention 44, and are designating CESC as lead intervenor on this contention." June 20 Board Order at p. 17.

B. Intervenors' Contention 18/44 was originally rejected by the Licensing Board "for lack of the requisite specificity" in that, inter alia, "[t]here is no claim that components of the Catawba reactors do not meet reference temperature requirements." March 5, 1982 Licensing Board Order at p. 35.

C. In response to interrogatories, Intervenors make clear that the sole Commission "reference temperature requirement" which Applicants may not meet (and upon which this contention is therefore based) is that set forth in "Appendix H, Section II.C.3.a re adjusted reference temperature not exceeding 100°F."

D. In response to the direct question whether "you challenge in sufficiency of any standard contained or referenced in Appendices G and H of Part 50," Intervenors respond "yes," and elaborate that they are "dubious about the entire construct [of such standards]. If the standards were really adequate there would be no need for a surveillance program." Intervenors' March 17 Responses to Staff Interrogatories at p. 9.

E. Intervenors contend that the using "coupon" testing "is simply too unreliable [upon which] to have a substantial technical judgment" (Intervenors' Responses to Applicants' June 20 Interrogatories at p. 5), in direct conflict with Appendices G and H in which the Commission bases



many of its requirements on such testing (e.g., Section III.A and B of Appendix H to 10 CFR Part 50).

F. Intervenor's contend that "data obtained from surveillance for reactor vessel fracture toughness cannot be utilized to determine the conditions under which the vessel can be operated safely" (Id. at p. 2), in direct conflict with, inter alia, Section V of Appendix G.

G. From Intervenor's responses to Applicants' and Staff's interrogatories, it is clear that with one exception, Intervenor's do not contend that Applicants do not comply with requirements contained in Appendices G and H of 10 CFR Part 50, or with the regulatory guidance regarding such requirements, e.g., Intervenor's state that (1) they know of no provisions of regulatory guidance regarding fracture toughness with which Applicants do not comply (Intervenor's June 20 Responses to Applicants' Interrogatories at p. 1), (2) the information regarding fracture toughness in Applicants' FSAF "is compatible with and derivative from Appendix G and the related ASME material" (Id. at p. 4), and (3) Section II.C.3.a of Appendix H is the only provision of 10 CFR §50.55(a), and Appendices G and H of 10 CFR Part 50 with which Applicants do not comply (Intervenor's March 17 Responses to Staff Interrogatories at p. 9).

H. On May 27, 1983, the Commission promulgated amendments to its requirements for fracture toughness and surveillance of reactor vessels to "clarify the applicability of these requirements to old and new plants, modify certain requirements as described below, and shorten and simplify these regulations by more extensively incorporating by reference appropriate national standards." 45 Fed. Reg., 75536 (November 14, 1980). See also 48 Fed. Reg. 24008 (May 27, 1983). Significantly,

these amendments of Appendices G and H were "designed to update them after seven years of use" (48 Fed. Reg. at 24008) and included consideration by the Commission of all applicable technical reports and information developed during that seven year period including consideration of any concerns regarding reference temperature increases in existing plants. The amendments do not become effective until July 26, 1983. However, in large measure they simply continue the previous practice of incorporating by reference the same ASTM Standards to which Applicants are committed to comply. See Applicants' FSAR at Section 5.3.

I. Intervenors have not raised by affidavit or otherwise special circumstances of a "special safety significance" relating directly to Catawba that make a prima facie showing "that application of . . . [Appendices G and H of 10 CFR Part 50] would not serve the purposes for which . . . [they were] adopted." 10 CFR §2.758.

J. Appendix H to 10 CFR Part 50 sets forth the Commission's surveillance requirements for reactor vessels. These requirements include, inter alia, the installation of surveillance specimen capsules (coupons) inside the reactor vessel (Sections I and II of Appendix H) and periodic withdrawal and testing (Section III of Appendix H) of such coupons to determine the effects of radiation on the material. Based on the results of such testing, Appendix G to 10 CFR Part 50 provides for continued unrestricted operation (Section V of Appendix G) or requires specific actions to correct any potential problems, such as annealing the vessel (Section V.D of Appendix G).

K. In the new amendments to Appendices G and H, the Commission has, inter alia, withdrawn Section II.C.3 in its entirety and replaced it with the requirement that specimen capsule numbers and associated

withdrawal schedules must be in conformance with the appropriate edition of the ASTM E-185 Standard.

L. The maximum number of capsules required by the 1982 edition of ASTM E-185, regardless of estimated end-of-life reference temperature, is 5 capsules. See Tables 1 of ASTM E-185 at p. 896 (1982 edition). As set forth in Applicants' FSAR at Section 5.3.1.6, Applicants have installed six specimen capsules (one more than the maximum number required regardless of the estimated end-of-life reference temperature).

M. The estimated end-of-life reference temperature is 110°F for the Unit 1 pressure vessel and 109°F for the Unit 2 pressure vessel. See Applicants' FSAR at Table 5.3.1-4 ( $52^{\circ}\text{F} + 58^{\circ}\text{F} = 110^{\circ}\text{F}$ ) and Table 5.3.1-5 ( $15^{\circ}\text{F} + 94^{\circ}\text{F} = 109^{\circ}\text{F}$ ), respectively.

N. Contrary to Intervenor's assertion, Section II.C.3.a of Appendix H to 10 C.F.R. Part 50, providing specimen capsule requirements for plants with estimated end-of-life reference temperature not exceeding 100°F, was not applicable to the Catawba pressure vessels.

### III. Discussion

#### A. There Is No Genuine Issue to Be Heard Regarding the Adequacy of Appendices G and H of 10 CFR Part 50

Appendices G and H to 10 CFR Part 50 provide the Commission's specific, detailed fracture toughness and surveillance requirements regarding reactor pressure vessels such as at issue in this contention. 38 Fed. Reg. 19012 (July 17, 1973). As the Commission stated when initially publishing its proposed regulations in this area:

Criterion 31 of the "General Design Criteria for Nuclear Power Plants" (Appendix A of Part 50) states that the reactor coolant pressure boundary shall be designed with sufficient margin to assure that when stressed under operating, maintenance, testing, and

postulated accident conditions (a) the boundary behaves in a nonbrittle manner and (b) the probability of rapidly propagating fracture is minimized. The criterion also requires that the design reflect consideration of service temperatures and other conditions of the boundary material under operating, maintenance, testing, and postulated accident conditions and the uncertainties in determining (a) material properties, (b) the effects of irradiation on material properties, (c) residual, steady-state and transient stresses, and (d) size of flaws.

The proposed amendments [i.e., Appendices G and H of 10 CFR Part 50] would specify minimum fracture toughness requirements needed to assure that Criterion 31 is satisfied and describe methods by which the fracture toughness of reactor coolant pressure boundary materials should be determined. [36 Fed. Reg. 12697 (July 3, 1971).]<sup>4</sup>

On May 27, 1983, the Commission promulgated amendments to its requirements for fracture toughness and surveillance of reactor vessels to "clarify the applicability of these requirements to old and new plants, modify certain requirements as described below, and shorten and simplify these regulations by more extensively incorporating by reference appropriate national standards." 45 Fed. Reg. 75536 (November 14, 1980). See also 48 Fed. Reg. 24008 (May 27, 1983). Significantly, these amendments of Appendices G and H were "designed to update them after seven years of use" (48 Fed. Reg. at 24008) and included consideration

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<sup>4</sup> After analyzing public comment, the final regulations regarding fracture toughness issued by the Commission in 1973 were even more stringent than those proposed:

The margin of safety against brittle fracture will be controlled more quantitatively by these amendments [Appendices G and H of 10 C.F.R. Part 50] than by the proposed rule, particularly with regard to specific guidelines for the treatment of heatup and cooldown conditions. Appendices G and H track the language of the ASME Code and have adopted certain of its requirements but also include several key supplemental requirements. [38 Fed. Reg. 19012, 19013 (July 17, 1973).]

by the Commission of all applicable technical reports and information developed during that seven year period including consideration of any concerns regarding reference temperature increases in existing plants.<sup>5</sup>

In short, the Commission has established detailed requirements for licensees regarding fracture toughness and surveillance of reactor pressure vessels. From Intervenor's response to Applicants' and Staff's interrogatories, it is clear that with one exception, Intervenor's do not contend that Applicants do not comply with such requirements, or with the regulatory guidance regarding such requirements, e.g., Intervenor's state that (1) they know no provisions of regulatory guidance regarding fracture toughness with which Applicants do not comply (Intervenor's June 20 Responses to Applicants' Interrogatories at p. 1), (2) the information regarding fracture toughness in Applicants' FSAR "is compatible with a derivative from Appendix G and the related ASME material" (Id. at p. 4), and (3) Section II.C.3.a of Appendix H is the only provision of 10 CFR §50.55(a), and Appendices G and H of 10 CFR Part 50 with which Applicants do not comply (Intervenor's March 17 Responses to Staff Interrogatories at p. 9).

Rather, Intervenor's make it explicitly clear that they contend that "the Commission's regulations in this area are inadequate."<sup>6</sup> In response to

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<sup>5</sup> Applicants note that these amendments do not become effective until July 26, 1983. However, in large measure they simply continue the previous practice of incorporating by reference the same ASTM E Standards to which Applicants are committed to comply. See Applicants' FSAR at Section 5.3.

<sup>6</sup> In that the recent amendments to such regulations were promulgated on May 27, 1983, Applicants assume that Intervenor's June 20, 1983 Responses to Applicants' Interrogatories (and pertinent responses to Intervenor's March 17, 1983 Responses to Staff's Interrogatories which were incorporated by reference into Intervenor's June 20 Responses) reflected consideration of such new amendment. See Intervenor's June 20, 1983 Responses to Applicants' Interrogatories at p. 8, note.



the direct question whether "you challenge the sufficiency of any standard contained or referenced in Appendices G and H of Part 50," Intervenor's respond "yes," and elaborate that they are "dubious about the entire construct [of such standards]. If the standards were really adequate there would be no use for a surveillance program." Intervenor's March 17 Responses to Staff Interrogatories at p. 9. Further, Intervenor's contend that the using "coupon" testing "is simply too unreliable [upon which] to base a substantial technical judgment" (Intervenor's Responses to Applicants' June 20 Interrogatories at p. 5), in direct conflict with Appendices G and H in which the Commission bases many of its requirements on such testing (e.g., Section III.A and B of Appendix H to 10 CFR Part 50). Intervenor's also contend that "data obtained from surveillance for reactor vessel fracture toughness cannot be utilized to determine the conditions under which the vessel can be operated safely" (Id. at p. 2), in direct conflict with, inter alia, Section V of Appendix G.

Applicants maintain that to the extent Intervenor's Contention 18/44 attempts to challenge the adequacy of the Commission's regulations, absent a showing of special circumstances, such issues may not be litigated in this forum. 10 CFR §2.758.<sup>7</sup> In this regard, Applicants note the Commission's direct admonition regarding attempts to litigate the possibility of reactor vessel rupture (as Intervenor's seek here) in view of the Commission's extensive and detailed requirements set forth in

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<sup>7</sup> See, also, Offshore Power Systems (Floating Nuclear Power Plants, ALAB-489, 6 NRC 194, 221 (1978)); Metropolitan Edison Co., et al. (Three Mile Island Nuclear Station, Unit No. 2), ALAB-456, 7 NRC 63, 67 (1978); Pacific Gas and Electric Company (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-410, 5 NRC 1398, 1402 (1977); Union Electric Company (Callaway Plant, Units 1 and 2). ALAB-347, 4 NRC 216, 218 (1976).



Appendices G and H of 10 CFR Part 50.

... the subject of pressure vessel integrity could, in special circumstances, be a proper area of inquiry during a licensing proceeding. The staff contended that protection against the consequences of vessel failure need not be required for a particular facility "unless it has been determined that for such facility there are special considerations that make it necessary that potential pressure vessel failure be considered" (Staff Brief, supra, at p. 10).

We adopt the new view expressed by the staff as consistent with the language of the regulation and the underlying Statement of Considerations. Where there are matters raised in a case that are of "special safety significance", supplementary measures in respect to the facility under review are an appropriate subject of hearing exploration. . . .<sup>5</sup>

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<sup>5</sup> To warrant inquiry, the evidence must be directed to the existence of special considerations involving a particular facility in issue. Licensing Boards, in their discretion, are empowered to exclude contentions or challenges which have no substantial or prima facie basis, or which merely amount to generalized attacks upon the standards presently required by the Regulations.

[(Emphasis added.) Consolidated Edison Co. of New York (Indian Point Unit No. 2), CLI-72-29, 5 NEC 20, 21 (1972). See also Wisconsin Electric Power Company (Point Beach Nuclear Power Plant, Unit 2), ALAB-137, 6 AEC 491, 502-3 (1973); Cleveland Electric Illuminating Co. (Perry Nuclear Power Plant, Units 1 and 2), LBP-A1-24, 14 NRC 175, 227 (1981).]

In sum, in order for Intervenor to be allowed to challenge Commission regulations regarding fracture toughness of reactor vessels in this proceeding they must provide special circumstances of a "special safety significance" relating directly to Catawba. In addition, such special circumstances must be raised by affidavit and must make a prima facie showing "that application of the rule or regulation (or provision thereof) would not serve the purposes for which the rule or regulation was adopted." 10 CFR §2.758.<sup>6</sup> See also Detroit Edison Co. (Enrico Fermi

Atomic Power Plant, Unit 2), LBP-78-37, 8 NRC 575, 584-5 (1978). In that Intervenor have not even attempted to raise such special circumstances by affidavit which meet these requirements, they are barred from challenging such regulations in this forum.<sup>8 9</sup> In sum, to the extent that Intervenor's Contention seeks to challenge the sufficiency of Commission regulations in this proceeding, Intervenor's Contention must be rejected.

B. There Is No Genuine Issue To Be Heard Regarding Applicants' Compliance With Section II.C.3.a of Appendix H to 10 CFR Part 50

Appendix H to 10 CFR Part 50 sets forth the Commission's surveillance requirements for reactor vessels. These requirements include, inter alia, the installation of surveillance specimen capsules (coupons) inside the reactor vessel (Sections I and II of Appendix H) and periodic withdrawal and testing (Section III of Appendix H) of such coupons<sup>10</sup> to determine the effects of radiation on the material. Based on, inter alia, the results of such testing, Appendix G to 10 CFR Part 50

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<sup>8</sup> Applicants note, however, that Intervenor are not without a forum to raise their concerns regarding Commission regulations. Intervenor may always file a petition for rulemaking pursuant to 10 CFR §2.802.

<sup>9</sup> Applicants note that to the extent that Intervenor's allegations regarding increases in reference temperature at various utilities is viewed as special circumstances, such allegations fall far short of the required prima facie showing of an issue of "special safety significance" relating directly to Catawba as required by Commission regulations and as set forth by the Commission in Indian Point, supra. In any event, as previously noted, the recent amendments to these regulations reflect the technical studies performed during the past seven years, to include consideration of increases in reference temperature. Accordingly, such information is clearly not "special circumstances."

<sup>10</sup> As to Intervenor's assertion, as previously noted, that testing of such specimens "is simply too unreliable," Applicants maintain that such assertion is a proscribed attack on Commission regulations. 10 CFR §2.758. See Section A, supra.

provides for continued unrestricted operation (Section V of Appendix G) or requires specific actions to correct any potential problems, such as annealing the vessel (Section V.D of Appendix G).<sup>11</sup>

In their March 17 Responses to Staff Interrogatories, Intervenor contend that Applicants may not sometime in the future be in compliance with Section II.C.3.a of Appendix H to 10 C.F.R. Part 50, which sets forth the number of surveillance capsules required to be installed in a reactor vessel and their withdrawal schedule for testing.<sup>12</sup> As previously noted, however, subsequent to this allegation the Commission promulgated amendments to Appendix H. 48 Fed. Reg. 24008. In such new amendments the Commission has, inter alia, withdrawn Section II.C.3 in its entirety and replaced it with the requirement that specimen capsule numbers and associated withdrawal schedules must be in conformance with the appropriate edition of the ASTM, E-185 Standard.<sup>13</sup> As set forth in Applicants' FSAR at Section 5.3.1.6, Applicants have committed to meet such requirements.

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<sup>11</sup> While annealing is not now an option that Applicants anticipate, there are no design features which would prohibit annealing. Staff's December 15, 1982 Responses to Palmetto Alliance Interrogatories at p. 99.

<sup>12</sup> Significantly, Section II.C.3.a of Appendix H was applicable to pressure vessels with an estimated end-of-life reference temperature that does not exceed 100°F. Applicants note that their end-of-life estimated reference temperature is 110°F for the Unit 1 pressure vessel and 109°F for the Unit 2 pressure vessel. See Applicants' FSAR at Table 5.3.1.-4 (52°F + 58°F = 110°F) and Table 5.3.1-5 (15°F + 94°F), respectively. Accordingly, contrary to Intervenor's assertion, Section II.C.3.a of Appendix H to 10 C.F.R. Part 50 was never applicable to the Catawba pressure vessels. Thus, Applicants contend that Intervenor's allegations regarding this contention were, in any event, factually flawed.

<sup>13</sup> Applicants note that the maximum number of capsules required by the 1982 edition of ASTM E-185, regardless of estimated end-of-life reference temperature, is 5 capsules. See Table 1 of ASTM E-185 at p. 896 (1982 edition). As set forth in Applicants' FSAR at Section 5.3.1.6, Applicants have installed six specimen capsules (one more than the maximum number required regardless of the estimated end-of-life reference temperature).

In sum, Applicants maintain that Commission action in withdrawing Section II.C.3.a has mooted Intervenor's concern. Further, to the extent Intervenor contends that the amended regulatory scheme regarding specimen capsules is inadequate, Applicants maintain that such constitutes a proscribed challenge to such regulations. 10 C.F.R. §2.758. See Section A, supra.

#### IV. Conclusion

From the foregoing, Applicants maintain that there are no material facts subject to resolution regarding Intervenor's Contention 18/44, and that Applicants' Motion for Summary Judgment be granted.

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

DUKE POWER COMPANY, et al.

(Catawba Nuclear Station,  
Units 1 and 2)

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Docket Nos. 50-413  
50-414

ARGUMENT AND DOCUMENTATION IN SUPPORT OF MOTION  
FOR SUMMARY DISPOSITION OF PALMETTO ALLIANCE/CAROLINA  
ENVIRONMENTAL STUDY GROUP'S DES CONTENTION 17

I. The Contention

DES Contention 17 states:

The DES is concerned with environmental impacts. Presumably these are best represented as the entire range from trivial to serious, in conjunction with the estimates of likelihood. The DES averages meteorological conditions in its consideration of accidents, 5.9.4.5. Because atmospheric inversions and quiet air are a very common feature in this region, accident consequences should be calculated for the extreme condition of inversion and very slow air movement.

In the matter of assessing serious accidents, the environmental assumptions are complex and again do not appear to consider extreme weather, p. 5-37. The DES, which differs from the CP FES in considering severe accidents, is at fault in not considering the full range of radiological impacts by not considering extreme, but frequently encountered, weather conditions.

In admitting this contention, the Board characterized it as follows: "DES-17 contends that the DES does not properly evaluate impacts of design basis and severe accidents because it does not isolate and analyze those impacts assuming extreme weather." [December 1, 1982 Memorandum and Order at p. 21.]



## II. Material Facts As To Which There Is No Genuine Issue To Be Heard

- A. DES Contention 17 asserts that the DES is deficient because its analyses of the consequences of design basis accidents and severe accidents do not isolate and specifically address the effects upon radiation dispersion of extreme weather such as inversion and very slow air movement.
- B. In order to determine the probable environmental effects of design basis events, the NRC Staff performed a "realistic" assessment of such events. (See DES, Section 5.9.4.5(1)) Consistent with the purpose of this analysis, the meteorological dispersion conditions assumed in these calculations "are an average value determined by actual site measurements."\* (DES, pp. 5-35).
- C. The NRC Staff also assessed the environmental effects of severe (Class 9) accidents. (See DES, Section 5.9.5.6(2)) In these calculations, the Staff used the assessment methodology set forth in the Reactor Safety Study (RSS) (NUREG-75/014), as rebaselined in NUREG-0715. Potential radiological release consequences were calculated by the consequence model used in the RSS, as adapted to the Catawba site. Among the site-specific environmental parameters used was the meteorological data, which represents "a full year of consecutive hourly measurements and seasonal variations." (DES, p. 5-37)

To obtain a probability distribution of consequences, these severe accident calculations were performed assuming the occurrence of each accident-release sequence at each of 91 different "start" times throughout

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\* In its interrogatory responses to CESG, the Staff indicated that this "realistic" evaluation "utilizes a meteorological parameter such that the calculated dose to an individual anywhere on the Exclusion Area Boundary would not be higher more than 50% of the time." NRC Staff Responses to CESG's Discovery and Document Requests, May 10, 1983, at p. 15.



a 1-year period. Each separate calculation uses the site-specific hourly meteorological data and seasonal information for the period following each "start" time. (DES, p. 5-37) This stratified sampling plan was chosen so that all seasons and all hours of the day would be represented.

- D. Adverse meteorology has been considered by the Staff in its safety analysis of design basis accidents, which was conducted pursuant to 10 C.F.R. Part 100. (DES, Section 5.9.4.5(1)) The reason that extremely poor (near worst case) meteorological conditions are assumed in the Staff's safety analysis is to assure that the plant has been properly designed and that it can operate safely in compliance with NRC requirements.

### III. Discussion

DES Contention 17 asserts that the DES is deficient in not considering extreme weather conditions in assessing the consequences of design basis and severe accidents. As will be demonstrated below, the DES's evaluation of the consequences of design basis and severe accidents is consistent with applicable legal requirements under NEPA. Despite the availability of considerable information from the Staff on discovery\*, Intervenorors have failed to make any showing that these evaluations are inadequate. They have not addressed the

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\* Discovery on DES-17 was conducted by all of the parties during March, April and May, 1983. On March 8, 1983, the NRC Staff filed its "First Set of Interrogatories to Palmetto Alliance and [CESG]." On March 28, CESG responded on behalf of both intervenors. On April 1, 1983, CESG filed its first and only set of interrogatories relating to DES-17: all of these questions were directed to the Staff. The Staff voluntarily responded to the interrogatories (despite the fact that CESG had failed to make the showing required under 10 C.F.R. §2.720(h)(2)(ii)) on May 10, 1983.

Applicants filed their first set of interrogatories on DES 17 on April 18, 1983, to which Intervenorors responded on May 2, 1983. ("May 2 Responses") Applicants then submitted follow-up interrogatories on May 18. Palmetto Alliance and CESG responded on June 6, 1983. ("June 6 Responses")

relevant NEPA standard at all. In sum, DES 17 fails to raise any triable issue of fact.

- A. The DES's "realistic" evaluation of design basis events is not required to isolate and address the effects of extreme weather such as "inversion and very slow air movement"

In the first paragraph of DES 17, Intervenor note that the DES averages meteorological conditions in its assessment of design basis events, and contend that since environmental impacts are presumably "best represented as the entire range from trivial to serious," design basis accident consequences "should be calculated for the "extreme condition of inversion and very slow air movement."

The NRC Staff has performed an assessment of design basis events which is discussed in Section 5.9.4.5 of the DES. This environmental assessment is referred to as a "realistic" design basis evaluation in order to contrast it with the more conservative safety evaluation of the same design basis events which was performed by the Staff pursuant to 10 C.F.R. Part 100. (The latter evaluation is discussed in Section C, infra).

The purpose of this "realistic" evaluation was to determine probable or anticipated environmental consequences (in terms of radiation dosage) of design basis accidents. Hence, the Staff did not calculate accident consequences using extreme or worst-case meteorological conditions. Such would be inconsistent with the intent of the evaluation (i.e., to determine likely accident consequence). Rather, the Staff utilized "meteorological dispersion conditions that are an average value determined by actual site measurements." (DES, p. 5-35)

The NRC Staff's consideration of meteorological factors in its "realistic" design basis accident evaluation is totally consistent with NEPA legal standards. It has been clearly established that the environmental review conducted by the NRC Staff in licensing proceedings "need not exhaust all theoretical possibilities, whether or not they have been identified by a party." Long Island Lighting Co. (Shoreham Nuclear Power Station), ALAB-156, 6 AEC 831, 836 (1973). Because the comprehensiveness of the review mandated by NEPA is subject to a "rule of reason," such review need not include "all theoretically possible environmental effects arising out of an action." Rather, the Staff's environmental review in the DES/FES "may be limited to effects which are shown to have some likelihood of occurring."\* Id. See also Northern States Power Co., et al. (Prairie Island Nuclear Generating Plant, Units 1 and 2), ALAB-455, 7 NRC 41, 48 (1978).

Since the basic thrust of agencies' responsibilities under NEPA is to predict the environmental effect of the proposed action before the action is taken and the effects are fully known, it has been recognized that "[r]easonable forecasting and speculation is thus implicit in NEPA . . . ." Accordingly, if the NRC Staff "makes a good faith effort" in the environmental review to describe "the reasonably foreseeable environmental impact" of the proposed action, along with the alternatives and their reasonably foreseeable environmental impact, and the irreversible and irretrievable commitment of resources which the action involves, it will fully satisfy the statutory requirement. Long Island

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\* The NRC interpretation of this aspect of NEPA is directly supported by judicial interpretation of the statute. \*See Natural Resources Defense Council v. NRC, 547 F.2d 633, 639 (D.C. Cir. 1976).

Lighting Co., supra, 6 AEC at 838 [emphasis added], citing Scientists' Institute for Public Information Inc., v. AEC, 481 F.2d 1079, 1092 (1973).

Thus, in considering whether or not the NRC Staff's treatment of extreme meteorological conditions in the DES satisfies NEPA, the appropriate inquiry is not -- as the Intervenor would have it -- whether various scenarios involving extremely poor meteorological dispersion conditions should have been given more emphasis in the DES assessment of accident consequences. Rather, attention should be focused on whether the "reasonably probable" effects of meteorology have been factored into the Staff's analysis of design basis accidents. Applying this NEPA standard, it is clear that the Staff's methodology for assessing the environmental effects of design basis events satisfies NEPA's "rule of reason."

Moreover, Intervenor have failed to make any showing that the Staff's design basis accident calculations do not satisfy NEPA. Indeed, Intervenor appear to have no legal or technical support whatsoever for their assertion that such accident consequences should be calculated for extreme meteorological conditions. Their legal basis, according to their discovery responses, is as follows:

P.A. and C.E.S.G. believe that NEPA and implementing regulations generally require that the NRC take full account of the impact of this licensing action. Such impact should include an evaluation of the worst case.

(June 6 Response to Interrogatory 3, p. 9. See also May 2 Response to Interrogatory 17, pp. 17-19).

Palmetto Alliance and CESG's technical support for their contention as it relates to design basis accidents is equally tenuous. Their basic premise is that the averaging of meteorological conditions is improper because

average values do not adequately represent the extreme (May 2 Responses to Interrogatories 2, 13, 14, 16; June 6 Reponse to Interrogatory 2). They offer no basis for this assertion. Moreover, it appears that Intervenor may have misconstrued the purpose of the "realistic" design basis accident calculations.

- B. The DES's analysis of severe accidents is not required to isolate and address the effects of "extreme, but frequently encountered" meteorological conditions

The second paragraph of DES 17 asserts that in the DES's assessment of serious accidents, "the environmental assumptions are complex and again do not appear to consider extreme weather," and that the DES is deficient "in not considering the full range of radiologic impacts by not considering extreme, but frequently encountered, weather conditions."

Applicants maintain that the same legal standards which govern the NRC Staff's "realistic" evaluation of design basis accidents apply to its environmental assessment of severe (Class 9) accidents. Under NEPA's "rule of reason," the Staff should consider the "reasonably foreseeable" environmental impacts of severe accidents, not "all theoretically possible environmental effects." Thus, contrary to Intervenor's allegations, there is no requirement that worst case meteorological conditions be isolated and factored into the Staff's accident consequence calculations. Rather, "reasonably-foreseeable" weather conditions may be assumed.

In any event, however, it appears that extreme weather conditions were not entirely overlooked in the Staff's severe accident analysis. In its assessment, the DES uses the methodology developed in the Reactor Safety Study (RSS), USNRC Report WASH-1400 (NUREG-75/014), as "rebaselined." In calculating potential release consequences, however,



the RSC model was adapted to the Catawba site. (DES, p. 5-37) Among the site-specific environmental factors used was meteorological information which represents "a full year of consecutive hourly measurements and seasonal variations." To obtain a probability distribution of severe accident consequences, the NRC Staff's calculations assume the occurrence of each accident-release sequence at each of 91 different "start" times throughout a 1-year period. Each calculation uses the site-specific hourly meteorological data and seasonal information for the time period following each "start" time. (DES, pp. 5-37) This stratified "sampling plan" was chosen so that all seasons and all hours of the day would be represented. Thus, to the extent that extreme meteorological conditions such as inversions and quiet air are common in the area, they should be reflected in these "start" times and, therefore, in the Staff's severe accident calculations. (FES, pp. 9-12)

Applying the "rule of reason," Applicants submit that the Staff's severe accident calculations gave ample consideration to the potential effects of extreme meteorology. To the extent that such effects were deemed to be "reasonably foreseeable," they were factored into the Staff's analysis. Additional emphasis upon worst case weather conditions is not required by NEPA.

Moreover, here again Intervenor's have made no showing in their discovery responses as to why the DES's severe accident calculations were improper or insufficient. Even after they had been provided with extensive information by the Staff in discovery on the basis for its severe accident calculations, Intervenor's were unable even to confirm whether they contended that the methodology used in the DES's severe accident analysis entirely failed to consider extreme weather, that it merely failed



to consider it sufficiently, and why the treatment of adverse meteorology therein was inadequate. Rather, they merely stated that their examination of the information provided to them by the Staff was "incomplete." (June 6 Response to followup interrogatory 12, p. 9) (This information had been available to Intervenors since May 10, 1983).

Intervenors' responses as to what additional consideration should be given to extreme weather in calculating severe accident radiation doses were equally unenlightening. Intervenors simply asserted that the Staff should "evaluate specifically the worst meteorological case reflected in the three years of observations for the site." (May 2 Response to Interrogatory 24, p. 19). No basis was given for this assertion in the May 2 Responses; in their follow up responses Intervenors indicated that their basis is "common sense and personal experience." (June 6 Response to interrogatory 14, p. 10). Nor could Intervenors indicate precisely the legal authority which they contend requires the NRC Staff to consider extreme meteorological conditions in calculating the radiation doses associated with severe accidents, merely stating (without specific citations or explanation) that "general NEPA authority" and the Commission's Policy Statement on severe accidents require such consideration of worst case impacts. (June 6 Response to followup interrogatory 13, p. 10).

In response to Applicants' followup interrogatory which sought to ascertain their reasons for refusing to accept the Staff's assumption of the "low probability" of a design basis or severe accident, and its assumption that the "resultant risk [of accidents] is exceedingly small," Intervenors merely reiterated word for word portions of DES Contentions 1 and 22. The Board rejected these portions of DES 1 and 22 for lack of

specificity and bases in its December 1, 1982 Memorandum and Order (pp. 8-11).\*

In sum, Intervenor's discovery responses relating to severe accidents are characterized by the same vagueness, unresponsiveness and failure to specify any specific deficiencies in the DES found in their discovery responses focusing on the Staff's design basis accident calculations, although they were provided with relevant Staff documents and information through discovery. They have failed to provide any specific technical bases for their disagreement with the methodologies employed, and have similarly failed to address applicable legal standards. In sum, Intervenor has not raised any triable issue of fact in DES 17.

C. Extreme Methodology is Considered in the Staff's Safety Analysis of Design Basis Accidents

Lest the Board believe that the potential effects of adverse meteorological conditions on accident consequences have not been adequately considered by the Staff, Applicants note that extreme weather has appropriately been considered by the Staff in its safety analyses of Catawba. The adequacy of such safety analyses is, of course, entirely beyond the scope of this contention. If Intervenor had wished to raise concerns with the Staff's

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\* In particular, the Board noted that the language in question cites no specific shortcomings in methodology or in the details of the calculations. Intervenor's reference to Brown's Ferry and Fermi were ruled to be beyond the scope of this proceeding. With respect to its critique of the Reactor Safety Study (WASH-1400), the Board specifically rejected Intervenor's assertion that the use of WASH-1400 for risk analysis in licensing is inappropriate, stating that "the discriminatory use of WASH-1400 is not contrary to Commission policy," and that any shortcomings in the original study "are taken into account in the Staff's DES analysis in various ways, including updated ("rebaselined") results for relevant risks." December 1, 1982, Order at pp. 8-9.

safety evaluation, they had ample opportunity to do so; but that time is now past.

In the interest of clarifying this issue, however, Applicants will briefly explain how the Staff's safety analysis considers extreme meteorology. As noted in Section 5.9.4.5 of the DES, the Staff, pursuant to 10 C.F.R. Part 100, evaluated the same design basis events which were the subject of its "realistic" environmental review. This assessment is performed in order to estimate the potential upper limits of individual exposure, rather than the most probable radiation doses calculated in the "realistic" assessment. An evaluation of regional and local climatological information, including extremes of climate and severe weather occurrences that may affect the design and siting of a nuclear plant, is required to ensure that the plant can be designed and operated within the requirements of NRC regulations. Information concerning the atmospheric diffusion characteristics of a nuclear power plant site is required for a determination that radioactive effluents from postulated accidental releases, as well as routine operational releases, are within Commission guidelines. The section of the Catawba SER that deals with meteorology (SER Section 15) was prepared in accordance with the review procedures described in the Standard Review Plan (SRP).

In making these calculations, much more conservative assumptions were made to the course taken by the accident and the prevailing conditions. (See SER, Chapter 15) These assumptions include near worst-case meteorological dispersion conditions (a "design weather condition") which produce "calculated doses at the EAB [Exclusion Area Boundary] that would not be exceeded more than 5% of the time because of other

meteorological conditions at the site." (FES, pp. 9-12). In other words, the meteorological dispersion conditions at the site would be more favorable than the "design weather condition" used in these calculations at least 95% of the time. Thus to the extent that extreme weather conditions such as inversion and very slow air movement are common in the area, they were represented in the severity of the "design weather condition" selected, and will produce higher calculated radiation doses. The methodology used by the Staff in performing this safety analysis is consistent with Reg. Guide 1.145, Reg. Guide 1.170, and the Standard Review Plan Series (NUREG-75/087).

Intervenors' objection to the Staff's safety evaluation of design basis accidents (which as noted, is beyond the scope of the contention) also stems from the fact that this analysis allegedly fails to emphasize sufficiently the effect of extreme weather conditions. (May 2 Response to interrogatory 19, p. 18). Other than this allegation, Intervenors' discovery responses provided almost no information. When asked to explain whether they agreed that the Staff had considered extreme meteorological conditions in performing its safety analysis, Intervenors replied (despite the availability of information in discovery) that they did not know. (June 6 Response to followup interrogatory 6, p. 9). When asked whether the Staff had made its calculations available, they stated that it had made information available, but that "our examination of this information is incomplete." (June 6 Response to followup interrogatory 9, p. 9). Similarly, when asked to explain the basis for their assertion that the Staff's safety analysis places insufficient emphasis upon extreme weather when the calculations in question are not set forth in the DES, Intervenors merely reiterated unresponsive statements to the effect that

"average values do not adequately represent the extreme." (June 6 Response to followup interrogatory 11, p. 9). Here again, Intervenor's have failed to raise any genuine issue of fact as to the Staff's safety evaluation. Accordingly, even if this topic was the subject of the contention, which it is not, Intervenor's' development of the issue has been so defective as to warrant summary disposition.

D. Conclusion

As demonstrated above, NEPA does not require the consideration of adverse meteorology in the Staff's accident calculations in the manner in which Intervenor's contend that this factor should be considered. The effect of extreme meteorology has been factored into the Staff's safety analysis, which insures that Catawba is designed and can be operated safely. Intervenor's have presented no viable legal or technical arguments which question this analysis --or, indeed, which raise any substantive questions as to the DES's assessment of design basis and severe accidents. Clearly, no genuine issue of material fact has been raised. Applicants accordingly submit that nothing remains of this contention to warrant its consideration at a hearing, and urge that their Motion for Summary Disposition on DES 17 be granted.



CONFIDENTIAL

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )  
 )  
DUKE POWER COMPANY, et al. ) Docket Nos. 50-413  
 ) 50-414  
(Catawba Nuclear Station, )  
Units 1 and 2) )

ARGUMENT AND DOCUMENTATION IN SUPPORT OF MOTION FOR  
SUMMARY DISPOSITION OF PALMETTO ALLIANCE/CAROLINA  
ENVIRONMENTAL STUDY GROUP DES CONTENTION 19

I. The Contention

Palmetto Alliance/CESG joint Contention DES 19 reads as follows:

Failure to evaluate the environmental costs of operation of Catawba as a storage facility for spent fuel from other Duke facilities compromises the validity of the favorable cost-benefit balance struck at the construction permit phase of this proceeding. Since the CP stage hearing, Duke Power has considerably expanded the Catawba spent fuel pool capacity and provided for denser storage of irradiated fuel. FSAR Table 1.2.3-1. Applicants intend to use Catawba for storage of irradiated fuel from the McGuire and Oconee nuclear facilities of Duke Power Company. FSAR 9.1.2.4; OL Application, pp. 11-12.

The Board in its Memorandum and Order of February 25, 1983 at pp. 8-9 admitted this contention stating:

The Board understands in admitting it that the primary focus of DES 19 would be on the environmental effects of routine releases from such transshipped fuel during normal operations at Catawba. Although the contention literally extends to environmental effects of severe accidents, there would be no reason to consider such effects unless it were first shown that severe accidents are credible in the spent fuel pool designed for Catawba.

II. Material Facts As To Which There Is No Genuine Issue To Be Heard

A. Intervenors are principally concerned with the health effects from large accidental releases of radiation and the economic costs to society caused by such accidents. Intervenors' Responses to Applicants' interrogatories, May 2, 1983 at p. 12.

B. The accidents raised by Intervenors are of a low probability. FSAR Sections 2.2.3.1.3.a, 8.2, 8.3, 9.1.2, 9.1.2.3.

C. Intervenors are also concerned with the environmental impacts associated with the large Catawba spent fuel pools. Intervenors' Responses to follow-up interrogatories, May 23, 1983 at pp. 7-8.

D. Intervenors do not maintain that there is any fundamental difference between Catawba spent fuel and Oconee/McGuire spent fuel in terms of heat load and radioactivity. Id.

E. Intervenors do not contend that the DES and the FES fail to evaluate the possible environmental effects associated with the storage of Catawba spent fuel at Catawba. Intervenors' Responses to Applicants' interrogatories, May 2, 1983 at p. 11.

F. The environmental analysis contained in the FES takes into account impacts from exposures to routine releases resulting from spent fuel from Catawba and the spent fuel from Oconee and McGuire that may be stored at Catawba. FES Section 5.9.3.1.2.

G. The FES recognizes that the five year old spent fuel from Oconee and McGuire stored at Catawba will not cause any detrimental environmental impact because the Catawba spent fuel pool has been designed to prevent the escape of the more radioactive Catawba spent fuel. FES Section 9 at 9-12, 9-13.

H. The FES references NUREG-0575, which states that storage of spent fuel has an insignificant impact upon the environment. FES Section 9 at 9-7, 9-8.

I. Applicants' witness A. L. Snow confirms the insignificant impact which spent fuel stored at Catawba (both Catawba and Oconee and McGuire spent fuel) will have on the environment. Affidavit of A. L. Snow.

### III. Discussion

Contrary to the Board's limitation of the contention to environmental effects of routine releases, Intervenor's discovery responses reflect their concern to be with accidents. See Intervenor's Responses, May 2, 1983 at p. 12, wherein Intervenor's stated:

Palmetto and CESC are principally concerned with the health effects from large accidental releases of radiation and the economic costs to society caused by such accidents.

See also Intervenor's Responses to Applicants' Follow-up Interrogatories, June 6, 1983 at pp. 5-6, wherein Intervenor's stated:

1. 10CFR 51.23(c) requires that "the impact statement shall take account of economic, socioeconomic, and possible cumulative impacts and such other fuel cycle imports as may reasonably appear significant." Any reasonable person would conclude that an accident in the handling and storage of spent fuel casks, or a loss of onsite/offsite power resulting in breakdown of the cooling trains, would raise the likelihood of a significant impact on the environment. Because such accidents, which would likely entail pool water boil off and possibly criticality, are made more likely by the increased number of fuel assemblies to be stored at Catawba (see Palmetto Alliance contention 16) an environmental statement conforming to NEPA guidelines must consider the environmental costs of operating Catawba as a storage facility for spent fuel from other Duke facilities.
2. Such an analysis would evaluate: impact of the doubling of the fuel pool capacity and resultant increased heat load and radiation inventory from

Oconee and McGuire spent fuels; loss of fuel pool cooling due to loss of on-site and/or offsite power; cask drop damage and possible criticality incidents from crushed fuel assemblies; accidents involving mishandling of casks including inadvertant unshielded removal of cask lids; the probability of cask drop accident; and external threats such as aircraft crashes.

3. Palmetto Alliance and CESG's contentions go beyond whether or not routine releases of radiation from Oconee and McGuire fuels have been considered.

Intervenors' focus upon accidents is beyond the scope of the admitted contention. Further, they have made no showing that the accidents they reference are credible.<sup>1</sup> Under such circumstances there is nothing to support the contention and it should be dismissed.

In addition, Intervenors' concern, as expressed in interrogatory responses, is unrelated to the incremental environmental impact associated with routine releases from Oconee and McGuire spent fuel stored at Catawba (which, of course, is the subject of the contention). See Intervenors' Responses to Applicants' Follow-up Interrogatories on DES Contentions 11, 17 and 19, June 6, 1983 at p. 7-8 wherein Intervenors state:

P.A. and C.E.S.G. do not contend that there is any fundamental difference between Catawba spent fuel and

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<sup>1</sup> The record reflects that the accidents underlying Intervenors' concern are all extremely remote. See FSAR Section 2.2.3.1.3 which reflects the probability of an aircraft accident to be approximately  $10^{-7}$ ; see FSAR Sections 8.2, 8.3 which discuss on-site and off-site power sources (NUREG/CR-3226 at p. 25 reflects that the probability of the loss of the diesel generators and off-site power is  $10^{-7}$ ); see FSAR Section 9.1.2 which discusses Catawba's compliance, for criticality purposes, with ANSI-N210-1976 which standard requires a 95% confidence level that the keff is less than 0.95; see FSAR Section 9.1.2.3 which reflects that it is physically impossible for a spent fuel cask to drop into the spent fuel pool.

It should also be noted that when asked if they had "performed any analyses which demonstrate the credibility of the severe accident(s) referenced" Intervenors responded "No." Intervenors' Responses to Applicants' Interrogatories, May 2, 1983 at p. 13.

Oconee/McGuire spent fuel such that one results in a greater heat load than the other.

• • •

Applicants seem to attribute to P.A. and C.E.S.G. the view that the origin of the spent fuel has an effect on how dangerous to the environment it is, or how likely it is to escape into the environment. It is obvious from our previous statements and responses that P.A. and C.E.S.G. do not make such an absurd contention.

Rather, Intervenor's concern is with the size of the spent fuel pool. S

Id., at p. 6-7 wherein Intervenor's state

When Duke Power doubles the amount of spent fuel to be handled and stored at Catawba we believe that something more than the NRC Staff's cursory treatment of this issue is required by NEPA, as implemented in 10 CFR 51.

• • •

The DES/FES evaluation is deficient because it does not adequately address the environmental risks associated with storing a much larger number of spent fuel assemblies.

If Intervenor's desired to pursue their concern that spent fuel pools of the size of Catawba have an environmental impact that must be evaluated they should have raised a general spent fuel pool contention; they did not. Rather Intervenor's (as well as this Board) limited the contention to the alleged environmental impact associated with the storage of Oconee and McGuire spent fuel at Catawba. So postured, Intervenor's should be expected to have provided information concerning the specific environmental impact associated with the storage of Oconee and McGuire spent fuel at Catawba; they did not. Rather Intervenor's simply raise the prospect of potential accidents. See Intervenor's Responses to Applicants' Interrogatories, May 2, 1983 at p. 10-11. Such failure to raise a genuine issue of material fact (which is totally inconsistent with the case law set forth in the attached Motion for Summary Disposition), coupled with the misplaced focus of their concerns, (i.e. accidents) warrants dismissal of Intervenor's DES Contention 19.



There is yet another reason which compels dismissal of this contention. To explain, Intervenor's assert that the incremental environmental impact associated with the storage of Oconee and McGuire spent fuel at Catawba must be evaluated. However, Intervenor's do not contend that there is a relevant difference between Catawba spent fuel and Oconee and McGuire spent fuel. Rather, they allege that storage of Oconee and McGuire spent fuel will result in a greater inventory at Catawba. See Intervenor's Responses to Applicants' Follow-up Interrogatories, June 6, 1983 at p. 7 wherein it is stated:

We are contending that if Catawba receives spent fuel from Oconee and McGuire as well as its own spent fuel, this will result in an expanded heat load and radiation inventory.

However, the spent fuel pools of Catawba could be filled entirely with Catawba spent fuel only. In response to a question asking if they "contend that the DES and the FES fail to evaluate the possible environmental effects associated with the storage of Catawba spent fuel at Catawba" Intervenor's responded "No." See Intervenor's Responses to Applicants' Interrogatories, May 2, 1983 at p. 11. Accordingly, if the Catawba spent fuel pools could be filled with spent fuel from Catawba only (which spent fuel Intervenor's acknowledge is no different from Oconee and McGuire spent fuel) then Intervenor's concern with the Catawba spent fuel pool being filled up with Oconee and McGuire spent fuel must be viewed as being enveloped by the environmental evaluation of the storage of Catawba spent fuel. In this regard, Intervenor's have stated that they do not contest the environmental evaluation conducted on the storage of Catawba spent fuel. Therefore, nothing remains to be litigated.

In any event, the environmental impact of spent fuel (be it all Catawba or otherwise) has been considered by the NRC Staff. See FES §5.9.3.1.2 which states:

The environmental analysis in Section 5.9 and Appendix D takes into account impacts from exposures to routine

releases resulting from spent fuel from Catawba and the spent fuel from Oconee and McGuire that may be stored at Catawba.

The FES further states "[f]or more information on the environmental impacts of spent fuel storage and handling (from the normal operations and accidents) see NUREG-0575". Id. Portions of NUREG-0575 are cited in the FES. Of importance is FES Section 9 at 9-7, 9-8, wherein it is stated:

The storage of spent fuel in water pools is a well established technology, and under the static conditions of storage represents a low environmental impact and low potential risk to the health and safety of the public. It makes little difference whether spent fuel is stored at a nuclear power plant or in an independent away-from-reactor facility designed for this purpose. This conclusion is based on existing water pool storage technology (NUREG-0575, p. ES-10).

The storage of LWR spent fuels in water pools has an insignificant impact on the environment, whether at AR [at reactor] or AFR [away-from-reactor] sites. Primarily this is because the physical form of the material, sintered ceramic oxide fuel pellets hermetically sealed in Zircaloy cladding tubes. Zircaloy is a zirconium-tin alloy which was developed for nuclear power applications because of its high resistance to water corrosion in addition to its favorable nuclear properties. Even in cases where defective tubes expose the fuel material to the water environment, there is little attack on the ceramic fuel (NUREG-0575, p. ES-12).

The technology of water pool storage is well developed; radioactivity levels are routinely maintained about  $5 \times 10^{-4}$   $\mu\text{Ci/ml}$ . Maintenance of this purity requires treatment (filtration and ion exchange) of the pool water. Radioactive waste that is generated is readily confined and represents little potential hazard to the health and safety of the public (NUREG-0575, p. ES-12).

There may be small quantities of Kr-85 released to the environment from defective fuel elements. However, for the fuel involved (fuel at least one year after discharge), experience has shown this to be not detectable beyond the immediate environs of a storage pool (NUREG-0575, p. ES-12).

There will be no significant discharge of radioactive liquid effluents from a spent fuel storage operation as wastes will be in solid form (NUREG-0575, p. ES-12).

See the Affidavit of A. L. Snow which corroborates the findings of NUREG-0575. Specifically, Mr. Snow explains why the environmental impacts associated with the storage of Oconee and McGuire spent fuel at Catawba are insignificant.

Lastly, with respect to Oconee and McGuire spent fuel stored at Catawba, the FES reflects that:

Once the 5-year-old spent fuel from the Oconee and McGuire nuclear power stations is in the Catawba spent fuel pool, it will not cause any detrimental environmental impacts because the spent fuel pool has been designed to prevent the escape of the more radioactive Catawba spent fuel. Therefore, the validity of the favorable cost-benefit balance struck at the construction permit phase has not been compromised. [FES at 9-12, 9-13]

Intervenors fail to provide any facts which questions the NRC staff's conclusions regarding Catawba, or those contained in NUCEG-0575. As such, Intervenors have failed to demonstrate the existence of a genuine issue of material fact, contrary to the requirements of law.

On the basis of the above discussion it cannot be said that the environmental impacts associated with the storage of Oconee and McGuire spent fuel at Catawba were disregarded. Environmental impacts were addressed and were found to be insignificant. That the FES does not contain volumunous reference to this matter does not render its treatment deficient. Rather, once an expert body such as the NRC concludes than an impact is insignificant it is not required to provide exhaustive documentation on the subject. See Izaak Walton League Of America v. Marsh, 655 F.2d 346, 377 (D.C. Cir. 1981) wherein the court stated:

"Particularly in light of the fact that reviewing courts should not resolve conflicting scientific opinions, we cannot conclude that the Corps' determination that the physical effects would be minor lacked a substantial basis. And given the Corps' conclusion that the physical effects would be minor, its decision not to conduct a major biological study was clearly justified. NEPA does not require federal

agencies to examine every possible environmental consequence. Detailed analysis is required only where impacts are likely. Carolina Environmental Study Group v. United States, 510 F.2d 796, 799 (D.C. Cir. 1975)."

#### IV. Conclusion

In summary, given the thrust of Intervenor's concerns (accidents), given their admission that for purposes of this contention there is no difference between Oconee, McGuire and Catawba spent fuel and given the FES' recognition that the contribution of the spent fuel pool (from Catawba spent fuel as well as Oconee and McGuire spent fuel contributions) to the routine release is insignificant, nothing remains of this contention which warrants its being entertained at an adjudicatory hearing. Accordingly, this contention should be summarily disposed.