



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Christine N. Kohl, Chairman
Dr. W. Reed Johnson
Thomas S. Moore

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| In the Matter of | ) | |
| PUBLIC SERVICE ELECTRIC AND GAS COMPANY, et al. | ) | Docket No. 50-272 OLA (Spent Fuel Pool Expansion) |
| (Salem Nuclear Generating Station, Unit 1) | ) | |

SERVED JUL 20 1981

Mr. Carl J. Valore, Northfield, New Jersey, for intervenor Township of Lower Alloways Creek.

Mr. Alfred C. Coleman, Jr., and Mrs. Eleanor G. Coleman, Pennsville, New Jersey, intervenors pro se.

Mr. Mark J. Wetterhahn, Washington, D.C., and Mr. Richard Fryling, Jr., Newark, New Jersey, for applicants Public Service Electric and Gas Company, et al.

Ms. Janice E. Moore for the Nuclear Regulatory Commission staff.

DECISION

July 17, 1981

(ALAB-650)

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This proceeding involves the request of Public Service Electric and Gas Company, et al. ("applicants"), for an amendment to the operating license of Unit 1 of the Salem nuclear facility. The amendment would permit the installation of new storage racks that would increase the capacity of the spent fuel pool from 264 to 1,170 assemblies.

The Licensing Board concluded that "the additional storage can be accomplished without endangering the health or safety of the public," and thus authorized the issuance of the license amendment. LBP-80-27, 12 NRC 435, 436, 458 (1980). Intervenors -- the Township of Lower Alloways Creek (TOLAC), and Alfred C. Coleman, Jr., and Eleanor G. Coleman -- have appealed that decision. After full consideration of the arguments on appeal, the record, and the Licensing Board's thorough decision, we affirm.

I

The Licensing Board's initial decision recites the procedural history of this case. 12 NRC at 436-438. We repeat here only those facts that provide necessary background information for the discussion below.

Three of the intervenors' contentions were litigated at the hearing before the Licensing Board.[1] The Colemans' contentions 2 and 6 -- treated together by the Board -- concerned the possible deterioration of the pool's rack structure and neutron absorption material ("Boral") and the consequent implications for accidental criticality[2] in the spent fuel

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1/ The Colemans' original petition to intervene contained 20 contentions. The Licensing Board, however, concluded that these contentions were either "not sufficiently definite" or beyond the scope of the license amendment proceeding. The Board also found that the petition was not in the proper form. Thus, the Board provided the Colemans with an opportunity to file an amended petition to intervene. Memorandum and Order (April 26, 1978) at 4-12. The Colemans then obtained counsel (the New Jersey Public Advocate's Office) and filed an amended petition with 13 contentions. (Attorneys from this office continued to represent the Colemans throughout this proceeding until the appeal. App. Tr. 14.)

Of the 13 contentions submitted by the Colemans with their amended petition to intervene, the Board eventually found four to be admissible. Order Following Special Prehearing Conference (May 24, 1978); Memorandum and Order (July 18, 1978). Two of TOLAC's original 11 contentions also were admitted. Memorandum and Order (April 26, 1978); Memorandum and Order (August 2, 1978). Applicants later moved for summary disposition of all admitted contentions. See 10 C.F.R. 2.749. In response to that motion, the Licensing Board dismissed two of the Colemans' contentions and one of TOLAC's, leaving a total of three contentions subject to evidentiary hearing. LBP-79-14, 9 NRC 557 (1979).

2/ "Criticality" -- or "supercriticality" -- describes the state of a system containing fissionable material (e.g., Uranium-235) that is capable of supporting a neutron chain reaction. A system, such as a spent fuel pool containing fuel assemblies, would be "critical" (or "supercritical") if its "effective multiplication constant," or keff, equalled 1.0 (or greater). Keff is the ratio of the number of neutrons produced from fissions in each generation to the number of neutrons produced in the preceding generation. The introduction of a neutron-absorbing material (like boron) to the system reduces $k_{eff}$, thus tending to prevent criticality.

pool.[3] TOLAC asserted that applicants have given inadequate consideration to possible alternatives to the spent fuel pool expansion.[4]

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[3] The Colemans' contentions 2 and 6 stated:

> 2. The licensee has given inadequate consideration to the occurrence of accidental criticality due to the increased density or compaction of the spent fuel assemblies. Additional consideration of criticality is required due to the following:
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> A. deterioration of the neutron absorption material provided by the Boral plates located between the spent fuel bundles;
>
> B. deterioration of the rack structure leading to failure of the rack and consequent dislodging of spent fuel bundles.
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> 6. The licensee has given inadequate consideration to qualification and testing of Boral material in the environment of protracted association with spent nuclear fuel, in order to validate its continued properties for reactivity control and integrity.

[4] TOLAC's contention 1 stated:

> The Licensee has not considered in sufficient detail possible alternatives to the proposed expansion of the spent fuel pool. Specifically, the Licensee has not established that spent fuel cannot be stored at another reactor site. Also while the GESMO proceedings have been terminated, it is not clear that the spent fuel could not by some arrangement with Allied Chemical Corp. be stored at the AGNS Plant in Barnwell, South Carolina. Furthermore, the Licensee has not explored nor exhausted the possibilities for disposing of the spent fuel outside of the U.S.A.

As the hearing progressed, the Board itself raised several additional issues by posing questions that concerned (1) the nature of the March 1979 events at Three Mile Island (TMI) and the effects (if any) on the spent fuel pool at that site, and (2) the consequences of a gross loss of water from the Salem pool with expanded capacity.[5] Applicants requested

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[5] The Licensing Board first asked the following three questions (Order, April 18, 1979):

1. To what extent did the accident at Three Mile Island affect the spent fuel pool at that site?

2. If there had been an explosion or "meltdown" at Three Mile Island, what effect would that have had upon the spent fuel pool? To what extent would it have mattered how much spent fuel was present at the pool?

3. If an accident such as the one at Three Mile Island occurred at Salem, to what extent would the accident affect the spent fuel pool? If an explosion or "meltdown" occurred at Salem, to what extent would that affect the spent fuel pool? To what extent would it have mattered how much spent fuel was present at the pool at Salem?

(The Board subsequently dropped the second question.)

At the July 10, 1979, hearing session, the Board made another TMI-related inquiry (Tr. 922-923):

> The proposed Annex to Appendix D, 10 CFR Part 50, appears to define a Class 9 accident as a sequence of failures which are more severe than those which the safety features of the plant are designed to prevent. The sequence of failures at Three Mile Island produced a breach of the containment and a release of radiation which could not be prevented by the safety features. Was the occurrence at Three Mile Island therefore a Class 9 accident? Was

(FOOTNOTE CONTINUED ON NEXT PAGE)

interlocutory review of the latter inquiry, contending that it reflected Board consideration of the consequences of a "Class 9 accident," contrary to Commission policy. We declined to review the matter, noting that "the Board below has marked a path of inquiry that stops short of considering a Class 9 accident." ALAB-588, 11 NRC 533, 536-537 (1980).

The issues heard by the Licensing Board and addressed in its initial decision thus fall into four categories: (1) the possible deterioration of the neutron absorption material and rack structure; (2) the consideration of alternatives to pool expansion; (3) the relationship of the events at TMI to this proceeding; and (4) the consequences of a gross loss of water. The Board resolved each of these matters in favor of expanding Salem's spent fuel pool.[6] It therefore

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5/ (FOOTNOTE CONTINUED FROM PREVIOUS PAGE)
the risk to health and safety and the environment "remote in probability," or "extremely low" at Three Mile Island, as those terms are used in the Annex?

Finally, the Board asked (LBP-80-10, 11 NRC 337, 346 (1980)):

> In the event of a gross loss of water from the storage pool, what would be the difference in consequences between those occasioned by the pool with expanded storage and those occasioned by the present pool?

6/ Only the applicants and NRC staff offered testimony and proposed findings on the Board's TMI questions. 12 NRC at 449. Moreover, with one minor exception (see note 42, infra), intervenors raise no arguments on appeal that concern this matter. Accordingly, this opinion does not specifically address the Licensing Board's disposition of its TMI questions. As is our practice, however, we have reviewed the record and find no basis for disturbing the Board's conclusions.

found "reasonable assurance that the activities authorized by the requested amendment to the operating license can be conducted without endangering the health and safety of the public" and "will not be inimical to the common defense and security." 12 NRC at 457-458. The Board also concluded that a grant of this license amendment does not require the preparation of an environmental impact statement (EIS) pursuant to the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321. Id. at 456-457. It thus authorized the Director of Nuclear Reactor Regulation to issue the license amendment, and these appeals followed.

II

Regrettably, we must begin by noting the great difficulty we have had in understanding the intervenors' arguments on appeal -- particularly as they relate to their exceptions, their proposed findings of fact and conclusions of law, and the contentions and other issues litigated below. The Commission's regulations require each party to confine its brief on appeal "to a consideration of the exceptions previously filed by the party and, with respect to each exception, [the brief] shall specify, inter alia, the precise portion of the record relied upon in support of the assertion

of error." 10 C.F.R. 2.762(a). The exceptions, which are to specify errors in the decision below, must in turn relate to matters raised in the party's proposed findings of fact and conclusions of law. This is because we will not entertain arguments that a licensing board had no opportunity to address and that are raised for the first time on appeal -- absent a "serious substantive issue." Tennessee Valley Authority (Hartsville Plant, Units 1A, 2A, 1B, and 2B), ALAB-463, 7 NRC 341, 348 (1978). Finally, a party's proposed findings and conclusions must be confined to the material issues of fact and law "presented on the record." 10 C.F.R. 2.754(c).

On the other side of the coin, we will not consider exceptions that are not fully briefed. Tennessee Valley Authority (Hartsville Plant, Units 1A, 2A, 1B and 2B), ALAB-367, 5 NRC 92, 104 n.59 (1977), and cases cited. As we observed in Public Service Co. of Indiana (Marble Hill Station, Units 1 and 2), ALAB-461, 7 NRC 313, 315 (1978) (footnotes omitted),

> briefs are necessary to "flesh out" the bare bones of the exceptions, not only to give us sufficient information to evaluate the basis of objections to the decision below, but also to provide an opponent with a fair opportunity to come to grips with the appellant's arguments and attempt to rebut them. The absence of a brief not only makes our task difficult but, by not disclosing the authorities and evidence on which the appellant's case rests, it virtually precludes an intelligent response by appellees. For these reasons we generally follow the course charted by the Federal courts and disregard unbriefed issues as waived.

A brief that merely indicates reliance on previously filed exceptions or proposed findings and conclusions, without providing meaningful argument, is of little value in appellate review. Hartsville, ALAB-463, supra, 7 NRC at 370. Indeed, a brief so deficient in argument precludes "an intelligent disposition of the issues." Duke Power Co. (Catawba Station, Units 1 and 2), ALAB-355, 4 NRC 397, 413 (1976). Above all else, however, "it is . . . incumbent upon intervenors who wish to participate [in NRC proceedings] to structure their participation so that it is meaningful, so that it alerts the agency to the intervenors' position and contentions." Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc., 435 U.S. 519, 553 (1978).

Both of the intervenor briefs come up short in satisfying the criteria discussed above. For example, while the Colemans may have invested substantial effort in the preparation of their brief, it is nonetheless difficult to discern what their arguments are, particularly as they relate to the 12 exceptions they filed.[7/] Most of their brief is styled "Findings of Fact"

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7/ Our comments take due account of the fact that the Colemans are participating in this appeal pro se. Thus, we do not hold them "'to those standards of clarity and precision to which a lawyer might reasonably be expected to adhere.'" Houston Lighting and Power Co. (Allens Creek Station, Unit 1), ALAB-590, 11 NRC 542, 546 (1980), quoting from Public Service Electric and Gas Co. (Salem Station, Units 1 and 2), ALAB-136, (FOOTNOTE CONTINUED ON NEXT PAGE)

and contains references to matters, both within and beyond the record, that have no apparent relationship to either their exceptions or proposed findings and conclusions.[8] In a two-page portion of their brief entitled "Exceptions," the Colemans attempt to link their exceptions to the "Findings of Fact" portion of their brief. But this rather limited and generalized material can scarcely pass for meaningful "argument." [9] As for TOLAC, it has apparently taken the term "brief" literally. Its seven-page offering is simply

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7/ (FOOTNOTE CONTINUED FROM PREVIOUS PAGE) 6 AEC 487, 489 (1973). On the other hand, the Colemans were obliged to familiarize themselves with the Commission's Rules of Practice and the proper briefing format. Pennsylvania Power and Light Co. (Susquehanna Steam Electric Station, Units 1 and 2), ALAB-563, 10 NRC 449, 450 n.1 (1979). Since these intervenors were represented by counsel until this appeal (see note 1, supra), they could have relied on pleadings filed earlier in the proceeding by their own counsel and others as general guidance in preparing their appellate brief.

8/ See, e.g., Br. "Findings of Fact" at 1-8, 10-12.

9/ For instance, with respect to exceptions 1, 2, 3, 8, 9, and 12, the Colemans argue, in toto:

> The Staff failed to investigate, analyze or review the facts known by both the Staff and Licensee, as outlined in Findings of Fact III, IV, V, VI, VII, VIII, IX and X, in the review process in preparation of the Environmental Impact Analysis and analysis by the Staff expert during these proceedings.

a rehearsal of its four-page "Exceptions." It adds little in the way of coherent argument to facilitate our disposition of this matter. See Hartsville, ALAB-463, supra, 7 NRC at 370. See also Public Service Co. of Oklahoma (Black Fox Station, Units 1 and 2), ALAB-573, 10 NRC 775, 805 (1979). Unlike the Colemans (see note 7, supra), TOLAC is represented in this appeal, as it was throughout the proceeding below, by counsel. We are, therefore, neither obliged nor inclined to judge TOLAC's arguments by the more lenient standards that may be applied to arguments advanced by a layman acting without legal assistance.

We emphasize that these comments are intended -- not so much for the sake of criticism (particularly in the case of the Colemans) -- as an expression of the limitations that the intervenors' briefs have placed on our appellate review. We have nevertheless endeavored to give the fullest consideration possible to every discernible argument. After a careful review of the briefs, other pleadings, and oral argument, we find that most of the intervenors' substantive arguments relate to the following matters: (1) the integrity of the neutron absorption material and spent fuel rack structure in the pool; (2) the denial of TOLAC's request for further

analysis of the propagation of oxidation to older fuel in the event of a gross loss of water from the pool; and (3) the adequacy of the environmental review. The Colemans also allege a number of basically procedural errors in the Licensing Board's disposition of the case. We address each point seriatim.[10]

A

The Colemans' contentions 2 and 6 (see note 3, supra) question the ability of the neutron absorption material to resist deterioration and thus prevent accidental criticality. On appeal, they continue to voice this concern.

1. First, the Colemans suggest that applicants' criticality calculations are invalid for failing to take account of the "realistic operating conditions" of the expanded pool.[11]

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[10] Except for the Colemans' generalized complaints (Br. "Findings of Fact" at 1), the intervenors raise no arguments involving the contentions dismissed earlier as a result of applicants' motions for summary disposition. See note 1, supra. We have nonetheless examined on our own initiative the record underlying the Licensing Board's action in that regard, and we have found no error requiring corrective action. Likewise, we have discovered no other basis for concluding that the reracking and expansion of the spent fuel pool at Salem Unit 1 might either pose an undue risk to the public health and safety or have a significant effect on the environment.

[11] Exxon Nuclear Company, Inc., which supplies the new storage racks for Salem, actually performed the criticality calculations for applicants. Exhibit 6-B, Staff Safety Evaluation ("SE") at 2-1.

See, e.g., Br. "Findings of Fact" at 10. To be sure, these calculations, which the staff reviewed and found acceptable, are not based on the actual contents of and operating conditions in the pool. Rather, they "are based on unirradiated fuel assemblies with no burnable poison and a fuel loading of 44.7 grams of uranium-235 (U-235) isotope per axial centimeter of fuel assembly." Exhibit 6-B, Staff Safety Evaluation ("SE") at 2-1. "Unirradiated" fuel is new fuel not yet "spent" in the reactor. It thus has a higher content of fissionable material than the spent fuel that is intended for storage in the pool and thus would have a higher $k_{eff}$. "Poison" refers to neutron-absorbing material, such as boron, which decreases reactivity and thus $k_{eff}$. The amount of fuel used in the calculations (44.7 grams of U-235 per axial centimeter) is the maximum permitted by the technical specifications of the license amendment. Id. at 2-3.

The calculations therefore conservatively postulate a "worst case" -- that is, a situation that contemplates storage of a maximum amount of fissionable material in pool water containing no neutron-absorbing boron. The $k_{eff}$ calculated for this scenario is 0.923 -- below the NRC's acceptance criterion of 0.95. Id. at 2-2.

The actual structure and normal operating conditions of the pool, which the Colemans would supplant for the conditions postulated in applicants' "worst case" analysis, would necessarily yield a lower $k_{eff}$, lessen the chance of criticality occurring, and be more favorable to applicants. To illustrate, the proposed spent fuel storage racks will be an assemblage of open-ended, double-walled, stainless steel "squared" cylinders, approximately 14 feet long and nine inches on each side. Boral (boron carbide and aluminum) plates will be welded between the double stainless steel walls. Id. at 2-1. The water surrounding the racks is to contain approximately 2,000 ppm boron in the form of boric acid. Tr. 444-448, 736-738. The pool will store spent -- rather than unirradiated -- fuel of necessarily diminished fissionable material content. Thus, in actual operation, the pool will contain, in addition to the Boral plates in the rack assemblage, borated water[12] and fuel that has already undergone substantial burn up in the reactor. These factors mitigate, not enhance, criticality. Applicants properly and prudently did not take them into account in performing their calculations.[13]

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12/ The primary function of the boron in the spent fuel pool water, however, is "to prevent the reactor water from becoming diluted" during refueling, when "the spent fuel pool water comes in contact with the reactor water." Tr. 44[illegible]

13/ Thus, the fact that applicants did not consider -- as the Colemans would have preferred (Br. "Findings of Fact" at 10, 12) -- the varying rates of fuel burn up and decay in its calculations is irrelevant. By using unirradiated fuel in its formula, applicants conservatively assumed there would be no burn up at all and consequently maximum fissionable material concentration.

The Colemans appear to argue further, however, that applicants' criticality calculations are defective because they do not take into account certain additional, "normal" contents of the spent fuel pool.[14] Such items include: spent fuel assemblies, burnable poison rods, thimble plugs, a "dummy" fuel assembly and control rod, actual control rods, an empty 14-foot basket, a similar basket containing cut-up control rod "fingers," and a bucket with grid straps. Br. "Findings of Fact" at 7. As noted above, spent fuel contains less fissionable material than the unirradiated fuel postulated in applicants' calculations. Poison rods and control rods (which also contain a "poison" like boron) absorb neutrons, thereby lowering the $k_{eff}$. The other items listed -- miscellaneous, ordinary pool hardware -- do not increase the chance

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[14] The Colemans raise this particular point for the first time on appeal. They characterize it as "substantive information" not discovered until after the hearing. App. Tr. 14. Apparently applicants' counsel provided a list of the pool's "normal" contents by letter of May 16, 1980. in response to a request from the Colemans' counsel. Br. "Findings of Fact" at 7 n.6. Clearly, counsel could have requested and obtained this information earlier, before the hearing was closed. Moreover, intervenors' counsel made no effort to bring this allegedly "substantive" information to the Board's attention and did not mention it in the Colemans' proposed findings and conclusions, dated June 26, 1980. We generally would disregard this point entirely (see p. 8 , supra). But in the special circumstances of this case, we address the matter at all only because it evidently is of some concern to the Colemans.

of criticality. Thus, consideration of these various contents of the spent fuel pool in applicants' criticality computations once again would have yielded a lower $k_{eff}$.[15]

2. The Colemans next contend that inadequate attention has been paid to the possibility that the Boral plates within each cell wall will corrode and deteriorate in the pool environment, enhancing the prospect of criticality.[16] The inner

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15/ Because this matter was not explored at the hearing, there is no evidence of record that explicitly discusses the effect of these assorted items on criticality. The staff's Safety Evaluation, however, stated that the criticality calculations performed by Exxon "yield the maximum neutron multiplication factor [$k_{eff}$] that could be obtained throughout the life of the fuel assemblies." Exhibit 6-B, SE at 2-2 (emphasis added). This statement thus supports our conclusion that these additional pool contents do not increase the likelihood of criticality.

16/ The Colemans also again refer to the "additional contents" of the pool and argue that it was error not to consider the possibly corrosive effect of these items on the Boral plates. Presumably, the Colemans' concern, as expressed at oral argument (App. Tr. 10), is that the interaction of these articles with the borated water in the pool may create chemical substances that might corrode the Boral plates. As we observed above at note 14, the Colemans did not raise this particular point at the evidentiary hearing before the Licensing Board. However, we note that this spent fuel pool is equipped with a water purification system that contains a filter and demineralizer. Exhibit 6-C, Staff Environmental Impact Appraisal ("EIA") at 4. This system, "similar to such systems at other nuclear plants," ibid., is intended to clarify and remove any foreign substances from the water that could cause the corrosion intervenors fear. See also Virginia Electric and Power Co. (North Anna Station, Units 1 and 2), ALAB-584, 11 NRC 451, 462 (1980), petition for review pending sub nom. Potomac Alliance v. NRC (No. 80-1862, D.C. Cir., filed July 28, 1980).

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layer of Boral material in each storage cell is "sandwiched" between two layers of stainless steel. The Colemans fear that pool water will seep between these layers, corroding the neutron-absorbing Boral and impairing its ability to prevent criticality. They question whether the storage cells and racks to be used in Salem Unit 1 have been adequately tested in actual use. Further, they suggest that the cell supplier's (Exxon) claim of "95 percent leaktightness/95 percent confidence level" is not good enough to protect the public health and safety. Br. "Findings of Fact" at 13-15.

Based on its consideration of the evidence,[17] the Licensing Board found that "Boral would corrode if it came into contact with the pool water." 12 NRC at 440. But the Board also found that "the Boral sheets would be enclosed completely in the welded stainless steel cell walls so as to separate the Boral from the pool water and provide protection against corrosion." Ibid. It concluded that "adequate consideration has been given to qualification and

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16/ (FOOTNOTE CONTINUED FROM PREVIOUS PAGE) In any event, a Commission regulation, 10 C.F.R. 50.59(b), "imposes a mandatory obligation upon the licensee -- just as enforceable as a technical specification -- to record and report all deviations from the operating procedures established for the maintenance and monitoring of water chemistry." Portland General Electric Co. (Trojan Plant), ALAB-531, 9 NRC 263, 274-275 (1979). This regulation, which makes any report filed a matter of public record, in our view provides adequate assurance that a safe and noncorrosive water environment will be maintained in the pool.

17/ The applicants and staff presented evidence on contentions 2 and 6; the Colemans presented no direct evidence, but participated in cross-examination. 12 NRC at 438, 443.

testing of the Boral to insure its continued integrity and ability to control reactivity." Id. at 443. The Board further noted that applicants are committed to a long-term surveillance program, involving the use of the same material that is in the storage cells to detect any degradation of the cells. Ibid. Finally, the Board found that even if any corrosion were to occur, it would consist of pitting, edge attack, and the formation of small bulges in the Boral plates. The boron carbide would remain in place and its ability to absorb neutrons would not be "appreciably" impaired. Id. at 441.

The record clearly supports the Licensing Board's findings and conclusions concerning the likelihood and effects of Boral corrosion. The stainless steel shrouds surrounding the Boral within each cell wall are seal-welded together pursuant to stringent quality control. Exhibit 6-B, SE at 2-13. Despite the Colemans' skepticism, Exxon's guaranty of 95 percent leaktightness with a 95 percent confidence level amply satisfies the public health and safety standard of the Atomic Energy Act.[18/] As applicants' witnesses testified at the hearing, the 95 percent figures do not mean that as many as five percent of the 1,170 spent fuel cells would leak. Rather, the 95/95 limit is simply an industry-prescribed

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18/ See Atomic Energy Act, Section 103, 42 U.S.C. 2133; 10 C.F.R. 50.91.

> measure of confidence that one must establish and meet to . . . assure that the cells are leak-tight . . . . From a pure [sic] statistical basis, . . . that would infer [sic] significantly less than 5 percent of the storage cells would leak. [Tr. 616-617.]

To back up its compliance with this standard, Exxon conducted "helium leak tests," which can detect extremely small pinholes in the cell walls. Tr. 617. Based on the results of these tests, Exxon expressed "confidence that no more than 20 to 30 cells could develop a leak." Tr. 770. The actual results of the first helium leak tests revealed pinholes in five to ten percent of the sample cells. Tr. 772. But, "after all the bugs had been worked out of the protection [sic] process, [Exxon] never did discover another leaking cell." Ibid. In any event, intervenors point to no evidence contradicting NRC staff testimony that potential storage cell leakage is "[n]ot a safety consideration." Tr. 733. See also Exhibit 6-B, SE at 2-15; pp. 21-22, infra.

The Colemans' complaint that the cells have not been tested over a sufficiently long period of time in actual use likewise fails to withstand scrutiny. The tests subjected samples of Boral material to a fuel pool environment for a period of approximately one year and extrapolated the results for 40 years. Exhibit 2, Affidavit of Edwin A. Liden,

PSE&G Project Licensing Manager, at 5-6. One of applicants' witnesses testified on cross-examination that reliance on tests of this duration and extrapolations based on them is a widely accepted practice, not unique to the nuclear industry. Tr. 565-567. An NRC staff witness agreed that this was an acceptable -- if not "overconservative" -- approach. Tr. 693-694. Further, in this case, the tests revealed nothing to suggest additional testing of Boral corrosion was necessary. Tr. 565-567, 615. In fact, Boral has actually been exposed in water for up to 20 years without significant deterioration. Fol. Tr. 652, Affidavit of Dr. John R. Weeks, NRC Staff Witness, at 3; Exhibit 8 at 2-3. Although such exposure primarily has been within a research reactor containing deionized (rather than borated) water, testimony indicated that the boric acid environment of a spent fuel pool would not cause "a great deal of change" in the amount of corrosion. Tr. 603-604.

Exxon's one-year test and the conclusions drawn from some 20 years of observing Boral in a water environment, however, do not mean that applicants intend to ignore the new cells once they are installed in the pool. On the contrary, as the Licensing Board pointed out (12 NRC at 443), applicants are committed to a long-term surveillance program. One year after installation and at subsequent two-year intervals, applicants

will examine sample Boral "coupons" from the Salem pool in order to detect any corrosion. Exhibit 2, Liden Affidavit at 6-7. See also Tr. 497-499, 584-588. A witness for the staff testified, without challenge, that he agreed with the applicants' described surveillance program (Tr. 694-695), and at oral argument staff counsel indicated that the Commission's Office of Inspection and Enforcement will monitor this program (App. Tr. 51). See also Tr. 683-685.

A further point should not be overlooked in connection with the issue of Boral integrity. There appears to be no dispute that Boral will corrode if it comes in contact with the pool water. See, e.g., fol. Tr. 652, Weeks Affidavit at 4; Exhibit 2, Liden Affidavit at 4; Tr. 624. To be more precise, however, it is the aluminum component of Boral that is subject to corrosion, rather than the boron carbide, which is inert in a spent fuel pool environment. Exhibit 2, Liden Affidavit at 4, 6; fol. Tr. 652, Weeks Affidavit at 2, 3, 4; Exhibit 8 at 5; Tr. 664-665. Thus, even if the Boral plates themselves were to incur some pitting, edge attack, and bulging, there would be no loss in the volume or change in the chemical composition of the neutron-absorbing boron carbide particles. Exhibit 2, Liden Affidavit at 6; Exhibit 8 at 2-3; Tr. 664-

665. As a consequence, the neutron-absorbing (or "poison") capability of the Boral in the storage cells would not be diminished, and any corrosion that occurs would not contribute to the achievement of criticality. Fol. Tr. 652, Weeks Affidavit at 1-2; Exhibit 6-B, SE at 2-15; Tr. 618.

The Colemans appear to argue, however, that the Licensing Board has not given adequate consideration to another "problem" associated with Boral corrosion -- the inward "swelling" of cell walls attributable to the hydrogren gas produced when aluminum corrodes. The staff's Safety Evaluation described such an occurrence at the Monticello facility in August 1978. Exhibit 6-B, SE at 2-13. The swelling of a cell's stainless steel walls can preclude either removal of the spent fuel assembly stored within or insertion of a fuel assembly into a cell. Notwithstanding arguments to the contrary, the Licensing Board explored every facet of this matter at length during the hearing and in its initial decision. It found that a similar condition could arise at Salem if water were to leak into the cells walls. 12 NRC at 441. But the Board concluded that venting the top of each cell (by drilling a small hole) to permit the gas to escape -- the procedure followed at Monticello -- is "adequate to protect the public health and safety" if a leak should develop. Id. at 443. To support this ultimate

conclusion, the Board made subsidiary findings that neither the stainless steel cell walls nor a stored fuel assembly would sustain damage from the gas pressure and swelling, and that the amount of hydrogen generated was too small to pose a risk of combustion. Id. at 441-442.

The record again supports the Board's findings and conclusions. The staff stated in its Safety Evaluation that this swelling, if it were to occur, would not present a safety hazard. Exhibit 6-B, SE at 2-15. The staff premised this view on tests performed by Exxon revealing that the worst consequences of the swelling phenomenon would be loss of the use of an empty fuel cell and the inability to withdraw a fuel assembly stored in a swollen cell without first venting it. Id. at 2-14. See also Exhibit 2, Liden Affidavit at 4-5; Tr. 618-619. Substantial testimony at the hearing concerned the relative merits of (1) venting empty cells before installation to prevent gas buildup, and (2) venting cells by semi-remote tooling only if swelling actually occurs after installation. As the Licensing Board correctly noted (12 NRC at 442), the staff prefers the former, while applicants opt for the latter method so as to minimize the chance of possible corrosion from water entering through the vent-holes. Compare

Tr. 619-631 with Tr. 715-734. The Board also recognized (12 NRC at 442), however, the staff's expressed satisfaction with applicants' choice and proposed methods in this regard, should any venting become necessary. See Tr. 714; Exhibit 8 at 5. The staff was unequivocal in its views that swelling in cell walls is an operational problem for applicants, and that safety is not a factor of any consequence with respect to venting before or after rack installation. Tr. 716, 731, 734. Moreover, the record shows no relationship between the swelling phenomenon and the corresponding venting of cells to relieve it, on the one hand, and, on the other, the increased likelihood of criticality.

In any event, the evidence demonstrates that applicants have taken special steps to prevent leaking cells and the resulting swelling that occurred at Monticello. First, the storage racks at Monticello were not provided by Exxon (Exhibit 2, Liden Affidavit at 7), and they differ in design and construction (Tr. 458). In particular, the racks at Salem are to be composed of discrete cells -- one for each fuel assembly -- welded to a base, rather than to each other, as at Monticello. Tr. 457-459. The cells are also sealed for greater protection against leaks, unlike those in use at Monticello. Tr. 626-627;

Exhibit 6-B, SE at 2-13. Second, as discussed above at p. 18, applicants and Exxon have established a stringent quality control program, learning from the experience at Monticello. Exhibit 2, Liden Affidavit at 7; Tr. 443, 627, 732.

In sum, the Licensing Board gave full consideration to all the arguments and evidence before it concerning the issue of Boral deterioration, and it concluded that the Colemans' contentions lacked merit. Our own review of the evidence supports that decision and clearly shows that (1) it is quite unlikely that a significant number of the spent fuel storage cells at Salem Unit 1 will leak; (2) applicants and the NRC staff will monitor the behavior of the new cells at prescribed intervals following installation; (3) if any cells do leak, the resulting corrosion will not impair the neutron-absorbing capability of the Boral; and (4) venting can safely alleviate any gas buildup within a corroded and swollen cell. None of the Colemans' arguments on appeal relating to these matters persuades us otherwise. We therefore agree with the Licensing Board that, "with respect to the issues raised by Colemans' Contention 2 and 6, the spent fuel pool can be modified and operated as proposed without endangering the health and safety of the public." 12 NRC at 443.

B

As noted above, the Licensing Board asked what the difference in consequences would be between a gross loss of water from the Salem spent fuel pool with expanded capacity, and such an event at the pool with its present capacity.[19] The Board found that, in the absence of cooling water in either the present or the expanded pool, the heat generated by radioactive fission products could cause the protective zirconium cladding around newly discharged spent fuel assemblies to oxidize and lead to a release of fission products. In the pool as proposed, with a denser storage configuration -- and consequently less natural convection cooling -- however, there would be a higher likelihood of oxidation.[20] 12 NRC at 453-454.

The Board therefore examined the witnesses on whether this oxidation could spread from fresher fuel to older spent fuel stored nearby.[21] An NRC staff witness, Dr. Allan S. Benjamin, testified that oxidation propagating via thermal

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19/ See note 5, supra.

20/ See also fol. Tr. 1387, Pasedag Direct Testimony at 4, 5, and Pasedag Further Testimony at 2.

21/ See note 24, infra.

radiation from newer fuel elements to older ones is a possibility that cannot be ruled out. Tr. 1391-1392, 1394, 1397, 1398-1399, 1481. Another staff witness, Mr. Walter F. Pasedag, agreed, but emphasized his belief that the oxidation of fuel four years and older would be "limited" and "would not lead to a substantial release of fission products beyond those released from the freshly discharged 1/3 core." Fol. Tr. 1387, Pasedag Further Testimony at 2. Both Dr. Benjamin and Mr. Pasedag testified that certain calculations and analysis would be necessary to transform this speculation into a more precise conclusion. Dr. Benjamin stated further that, without such analysis, he was unable to give an opinion on whether the propagation of oxidation to older fuel assemblies was more, or less, likely to occur. Tr. 1437. He expressed his belief, however, that the possibility of this occurrence is "significant enough" to warrant consideration in determining the difference in consequences between the pool as it now exists and as expanded, and that one person could do the analysis in a "few months." Tr. 1488, 1483.

Intervenor TOLAC then orally moved the Licensing Board to suspend the hearing and order this analysis to be performed. Tr. 1492. See also Tr. 1801-1803. The Board deferred ruling

at that time but later denied TOLAC's motion and closed the record, concluding that "the further analysis cannot be justified in light of the evidence which has already been received." Tr. 1495; Order of May 9, 1980. The Licensing Board subsequently reaffirmed that ruling in its initial decision (12 NRC at 455):

> We do not believe . . . that further study is needed to reach our decision. Mr. Pasedag's testimony convinced us that even if oxidation did propagate to the older fuel the resulting radioactive release would not be significant in comparison to the radioactive release from the recently discharged fuel. When we consider that Dr. Webb [TOLAC's witness] was unable to describe any credible mechanism for propagation despite a specific invitation to do so, and consider that a gross loss of water is in itself an event of very low probability, we do not believe that further study of propagation is necessary to answer our question. We are satisfied that in the event of a gross loss of water from the spent fuel pool, there would not be a great difference between the consequences occasioned by the proposed storage configuration and those occasioned by the present one.

Here on appeal, both TOLAC and the Colemans contend that the Board erred in not ordering the further analysis of the propagation of oxidation from fresh to older spent fuel. TOLAC, relying on Northern States Power Co. (Prairie Island Plant, Units 1 and 2), ALAB-284, 2 NRC 197 (1975), argues that additional hearing and evidence in the form of the propagation analysis is necessary to resolve this issue, and it

requests a remand and reopening of the record on this point. Br. at 1, 2. It also disputes the Board's conclusion that there would not be a great difference in the consequences of a gross loss of water from the pool as expanded and in its present configuration. Id. at 3. The Colemans simply point to Dr. Benjamin's testimony (Tr. 1488-1489) that further analysis is warranted. They also argue that the fact that Mr. Pasedag and Dr. Benjamin disagreed as to the value and relevancy of the analysis (see Tr. 1506, 1579-1580) underscores the need for more specific data. Br. "Findings of Fact" at 17.

It is worthwhile to note also what intervenors do not argue. While challenging the Licensing Board's decision not to seek further propagation analysis and its ultimate conclusion on the gross loss of water question, neither TOLAC nor the Colemans appear to dispute the specific underpinnings of that conclusion -- i.e., that (1) even if oxidation were to spread to older fuel, the resulting radioactive releases would be insignificant compared to those from recently discharged fuel;[22] (2) TOLAC's witness was unable

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[22] Indeed, on brief (at 2), TOLAC concedes that "this may be true."

to describe a credible mechanism for propagation; and (3) a gross loss of water is an event of very low probability. Nor do intervenors challenge any of the evidence or testimony of record concerning the propagation of oxidation to older fuel.[23/] The essence of their arguments is that because one witness testified that some further study is warranted, it therefore must be done.

In proceedings that involve matters of public health and safety, the testimony of a qualified witness calling for further analysis of any aspect of a pending proposal merits serious consideration. For that reason, intervenors' arguments for further study of the propagation of oxidation to older fuel in the pool strike a responsive chord. But upon closer scrutiny, they fail to ring true.

Intervenors -- in particular, the Colemans -- suggest that there is a "conflict" between the testimony of the two NRC staff witnesses, Mr. Pasedag and Dr. Benjamin. In fact, there is no real conflict. Both agreed that propagation of

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23/ TOLAC casually observes on brief (at 2) that the Board excluded portions of the prepared testimony of Dr. Richard E. Webb and all of the prepared testimony of Dr. David B. Fankhauser -- both TOLAC witnesses. See 12 NRC at 451-452. Intervenor does not argue, however, that the Board erred in so ruling. In fact, TOLAC could not now make such an argument since it offered Dr. Webb's testimony for admission "subject to the rulings that the Court [sic] has already made striking certain portions of that testimony" (Tr. 1697), and it failed to challenge the rejection of either witness' testimony in its proposed findings and conclusions. See p. 8, supra.

It is of interest to note here that the Board also struck all of applicants' testimony on the gross loss of water question as "not responsive." 12 NRC at 451.

oxidation to older fuel "cannot be ruled out." See, e.g., fol. Tr. 1387, Pasedag Further Testimony at 2; Tr. 1391. Dr. Benjamin was simply unable to state precisely whether such propagation is more or less likely to occur -- in effect, to quantify or reduce it to a known percentage -- without performing further calculations and analysis. Tr. 1437, 1482, 1488-1489. While this information might be of academic interest or value, the existence of other undisputed factors in this case makes it unnecessary for decisional purposes.

For example, a significant factor in connection with the Board's consideration of the propagation of oxidation to older fuel in the event of a gross loss of water is the amount of radioactive releases likely to be associated with the oxidation. The analysis suggested by Dr. Benjamin would not provide further data on this point; it would only confirm or reveal more precisely the percentage chance that oxidation would even spread to older fuel. In fact, the testimony of Mr. Pasedag assumed that there would be some oxidation of older fuel but indicated that the radioactive releases from it would not substantially exceed those from fresher spent

fuel.[24] He explained why:

> [t]his is a result of several factors, including the [prior] decay of volatile fission products (other than Cs-137), the fact that the primary source of energy is external to the rods, the thermal insulating property of the zirconium oxide layer which would reduce heat conduction to the interior of the rod, and the formation of temperature gradients opposed to the direction of diffusion. Although some eutectic formation would occur after heating the rod to the zirconium melting temperature, the $UO_2$ matrix cannot be expected to reach its melting point.

Fol. Tr. 1387, Pasedag Further Testimony at 2. See also Tr. 1448-1450. Intervenors point to no testimony or evidence that contradicts Mr. Pasedag's statements concerning the limited releases from oxidized older fuel assemblies.[25]

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[24] In this regard, a reminder is in order. The proposal under consideration in this proceeding is to expand the capacity of Salem's spent fuel pool. A major difference between the pool as expanded and as it now exists will be the presence of older spent fuel (four years and older). It is thus the effects of that difference that we must assess -- not the effects attributable to the spent fuel pool itself.

[25] TOLAC's witness, Dr. Webb (see note 23, supra), testified that substantial releases of radioactivity could result from a zirconium "fire" (oxidation) following a gross loss of pool water. The Licensing Board, however, found that Dr. Webb was unable to describe with any degree of specificity a mechanism for release of the radioactivity from the pool or to relate his testimony to the presence of older spent fuel in the pool. 12 NRC at 452-453, 455.

Even though intervenors have not directed our attention to any portion of Dr. Webb's testimony that addresses this matter, we have nonetheless reviewed both his written and oral submissions. We agree with the Licensing Board (id. at 453) that much of it is "ill-organized and difficult to follow." See, e.g., Tr. 1706-1716, and prepared testimony of Dr. Webb there referenced.

Another factor contributing to the Licensing Board's determination not to require further analysis of oxidation propagation is its finding that the gross loss of water postulated in its question is "itself an event of very low probability." 12 NRC at 455. In fact, no witness was able to describe a credible mechanism for such an occurrence. Id. at 445.

Although TOLAC calls the testimony of its witnesses, Dr. Richard Webb and Dr. George Luchak, "persuasive" (Br. at 3), our review of their submissions reveals that they fall far short of that generous characterization.[26/] As we observed above (see notes 23 & 25, supra), much of the prepared testimony of Dr. Webb was "'ill-organized and difficult to follow'" and stricken from the record without TOLAC's objection. In particular, the Board excluded virtually all of Dr. Webb's testimony relating to how a gross loss of water might occur. Tr. 1377-1378; fol. Tr. 1697, Webb Testimony dated February 27, 1979, at 16-33. As for Dr. Luchak, the Board found him "not qualified" to testify about the probability or consequences of a gross loss of

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26/ Again TOLAC fails to cite the specific testimony that it deems "persuasive."

water event at Salem. Tr. 913; 12 NRC at 445. It struck that part of Dr. Luchak's testimony, and TCLAC neither objected in its proposed findings and conclusions nor objects here on appeal.

An NRC staff witness, Mr. Gary Zech, testified on cross-examination that there was no credible mechanism for a serious accident at the Salem spent fuel pool. Tr. 1042-1043. He also testified in response to Board questioning that the pool environment is a "very stable" one, constructed of reinforced concrete and classified seismic category 1.[27] He could conceive of no credible mechanism for the loss of water from the pool, except by slow evaporation, and noted the existence of several sources of back-up water. Tr. 1047-1048. Another staff witness, Mr. Pasedag, was also unable to identify any credible mechanism for a gross loss of water. The largest credible leak he could postulate was 710 gallons per minute -- or a decrease in water level of 1.1 inches per minute from the approximately 39 feet of water in the pool.[28] Even this leak could occur only in the "highly unlikely" event that all 10 leak-off tubes were to discharge at maximum capacity as a result of multiple punctures of the pool's stainless steel liner. At least two alarm

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27/ See Regulatory Guide 1.29, Seismic Design Classification (September 1978); 10 C.F.R. Part 100, Appendix A, III(c).

28/ See Final Safety Analysis Report, Fig. 9.4-1.

systems would detect the leakage and automatically activate the sump pumps, permitting eventual capping of the leak-off tubes. Fol. Tr. 1387, Pasedag Direct Testimony at 1-2.

Based on the relevant, admissible evidence of record, we find that the Licensing Board was justified in concluding that a gross loss of water from the Salem spent fuel pool was an event of such low probability as to warrant no further inquiry. See also ALAB-588, supra, 11 NRC at 536-537.[29]

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29/ Intervenors raise two other points that relate to the hypothetical gross loss of water event. First, the Colemans complain that inadequate attention has been paid to an event of incomplete drainage of the pool. Br. "Findings of Fact" at 8-9. This matter arose briefly during Board questioning at the hearing (Tr. 1428-1433), but no party pursued it further or discussed it in its proposed findings and conclusions. Consequently, the Colemans are precluded from raising the issue here on appeal (see p. 8, supra). We note, however, that an incomplete drainage is inherently a variation of a gross loss of water. As such, it would be reasonable to assume that, like a gross loss of water, there is no identifiable, credible mechanism for an incomplete drainage event either.

Second, TOLAC appears to argue that, in the event of a gross loss of water, the proposed increase in spent fuel storage capacity would then have a significant effect on the human environment, so as to require the preparation of an environmental impact statement. Br. at 3. NEPA, however, does not require consideration of circumstances that are "only remote and speculative possibilities." See Natural Resources Defense Council, Inc. v. Morton, 458 F.2d 827, 838 (D.C. Cir. 1972). In view of the absence of any credible mechanism for a gross loss of water, NEPA clearly does not require an EIS on the hypothesized consequences of such an unlikely event.

The record supports the Licensing Board's findings that (1) the radioactive releases from any oxidation of older fuel would not be significant relative to those from recently discharged fuel, (2) a gross loss of water is an event of very low probability, and (3) further analysis of whether oxidation could propagate to older fuel is therefore "not . . . needed." 12 NRC at 455. Intervenors have thus failed to carry their "heavy burden" of convincing us that a propagation analysis would have made a relevant contribution to the Board's resolution of its gross loss of water question. See Kansas Gas and Electric Co. (Wolf Creek Station, Unit No. 1), ALAB-462, 7 NRC 320, 338 (1978), and cases cited. Generalized assertions to the effect that "more evidence is needed" are simply not enough to support a reopening of the record.[30/]

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30/ Prairie Island, ALAB-284, supra, upon which TOLAC relies in requesting a reopening of the record, is inapposite. That case involved "a difficult, highly technical [reactor] safety issue having many facets" -- steam generator tube integrity. 2 NRC at 206. In ALAB-284, we identified five major areas of concern that warranted further evidentiary hearing (condensate demineralization, detectable leakage before tube failure, sufficiency of eddy current surveillance, monitoring of secondary water chemistry, and tube plugging criteria). Because we found (1) certain evidence inconsistent and inadequate to support that Licensing Board's decision, (2) the absence of any reference to other unfavorable evidence, and (3) new evidence not considered by the Board below, further evidentiary hearings were imperative. The denial of what has been revealed as an unnecessary analysis of oxidation propagation in the instant spent fuel pool case is in no way comparable to the acute circumstances in ALAB-284.

C

Only one of the contentions litigated below raised an issue concerning the adequacy of the environmental review of the instant spent fuel pool expansion proposal. TOLAC's contention 1 asserted that applicants had not given sufficient consideration to various alternatives to the pool expansion.[31/] Intervenors nonetheless now raise several arguments that relate more broadly to environmental issues, only some of which arise out of TOLAC's contention 1.

1. Although its contention referred to several possible alternatives, TOLAC asserts here on appeal only that "storage at an independent spent fuel storage installation (ISFSI) in a dry unpopulated climate was not adequately evaluated by the [applicants]." Br. at 3. As support for its view, TOLAC simply refers to unspecified direct testimony of Drs. Webb and Luchak.

TOLAC's argument is wholly without merit. The written testimony of applicants' witness, Mr. Liden, indicated that, in the absence of reprocessing (which President Carter halted in 1977) and an express agreement with Salem, storage at inde-

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31/ See note 4, supra. The Licensing Board's question concerning a hypothetical gross loss of water also injected an environmental issue into the proceeding. The Board queried whether the consequences of such an event in the pool as expanded would require evaluation in an EIS. 12 NRC at 451. The Board eventually concluded they would not (id. at 455, 456), and TOLAC appears to challenge this conclusion on appeal. But as we pointed out in note 29, supra, NEPA does not require an EIS on the hypothetical consequences of a gross loss of water

pendent installations such as AGNS at Barnwell, S.C., GE at Morris, Ill., and NFS at West Valley, N.Y., is not available. Exhibit 2, Liden Affidavit at 10-11. Mr. Liden also averred that the economic and environmental costs of constructing an ISFSI would be greater than the reracking proposed for Salem. Id. at 11. The staff's environmental impact appraisal (EIA) explored numerous alternatives, including storage at both private and government-sponsored ISFSIs, and fully supported Mr. Liden's views. The EIA also noted that, apart from the greater costs associated with the construction of an ISFSI, the time necessary to build and begin operating an ISFSI (approximately five years) effectively eliminates this as a feasible alternative for applicants' approaching storage needs. Exhibit 6-C, EIA at 14-16. TOLAC points to no specific testimony on either direct or cross-examination that contradicts this, and we have discovered none ourselves.[32/]

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32/ Review of the testimony of Drs. Webb and Luchak, upon which TOLAC generally relies, provides a possible clue as to why TOLAC neglected to cite any portions specifically (Br. at 3). Dr. Webb's testimony did not even address the "consideration of alternatives" contention. Dr. Luchak's written testimony, which repeated much of the cost data in the staff's EIA, asserted only that "[i]t appears to be a highly feasible alternative that utilities could collectively obtain a site and construct an ISFSI." Fol. Tr. 918, Luchak Testimony at 3-4. No facts or probative matter is cited to support this sweeping statement. The remainder of Dr. Luchak's statement as well as his oral testimony were similarly generalized and failed to refute that of the applicants and staff.

In these circumstances, the Licensing Board quite properly found (12 NRC at 446)

> that construction and use of an ISFSI would be more costly than the proposed expansion at Salem, that it would produce environmental impacts as great or greater than the proposed expansion, that it would not reduce appreciably the risk or consequences of a gross loss of water in the spent fuel pool, and that it is unknown whether an ISFSI can or will be constructed in time to be available for storage of spent fuel from Salem Unit 1 when that storage is needed.

We therefore also agree that applicants and the staff adequately considered an ISFSI as an alternative to reracking the existing pool at Salem.[33/]

2. The Colemans assert that the Licensing Board erred in finding, with respect to the alternative of offsite storage at other reactors, that "Hope Creek Units 1 and 2 . . . are

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33/ Indeed, as the Licensing Board evidently recognized (12 NRC at 457), the consideration of any alternatives was gratuitous. Sections 102(2)(C) and (E) of NEPA require consideration of alternatives only when the proposed action is a "major" one "significantly affecting the quality of the human environment," or "involves unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. 4332(2)(C), (E). See North Anna, supra, 11 NRC at 456-459. As we discuss below (pp. 42-46), the record shows that approval of the instant proposal does not constitute a major action with a significant effect on the environment. Moreover, no party has suggested, before either the Licensing Board or us that the Salem pool expansion involves unresolved conflicts between alternative uses of available resources as envisioned by Section 102(2)(E).

the only other nuclear facilities owned by the Licensee." 12 NRC at 447. They state that the lead applicant, Public Service Electric and Gas Co., owns a 42.5 percent interest in Units 2 and 3 of the Peach Bottom facility. Br. "Exceptions" at 1. The Colemans, however, make no attempt to argue that the challenged statement fatally impairs the Board's ultimate conclusion that offsite storage at other reactors is not a feasible alternative.

Applicants admit (Br. at 58) that PSE&G owns a portion of Peach Bottom.[34/] But as both they and the staff point out this minor factual misstatement provides no occasion for reversal of the Board's conclusion.

Relying on the staff's EIA, the Licensing Board found that Hope Creek has boiling water reactors (BWR) that use fuel assemblies with dimensions different from those used at the pressurized water reactors (PWR) at Salem. Thus, the racks at Hope Creek would have to be replaced for storage of Salem's spent fuel, with a resulting reduction in storage capacity. The Board also noted a government report concluding

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34/ The Licensing Board's error appears to arise from a statement in the EIA that "[t]he only other nuclear facilities owned by the licensee are the Hope Creek Units 1 and 2 currently under construction . . . ." Exhibit 6-C, EIA at 17. Although the staff submitted the EIA well before the hearing commenced, apparently no party challenged the accuracy of the statement at the hearing.

that up to 46 percent of the operating reactors in the United States will be unable to refuel between 1975-1984 unless additional spent fuel storage space is found. 12 NRC at 447-448. See also Exhibit 6-C, EIA at 18. Finding no evidence to the contrary, the Board concluded, in agreement with the staff, that applicants "could not prudently rely upon the Hope Creek units or any other power facility to provide additional storage when the Salem pool is filled." 12 NRC at 448 (emphasis added).

We take official notice of the fact that the reactors at Peach Bottom are, like Hope Creek, BWRs. Thus, the Board's unchallenged finding concerning the need for new racks of different dimensions in order to store Salem spent fuel at Hope Creek pertains with equal force to Peach Bottom. Similarly, the Board's finding as to the limited storage space available among reactors generally at this time perforce extends to Peach Bottom. Indeed, the Licensing Board explicitly stated that applicants could not rely on "any other power facility" for storage. Ibid. At worst, the Board's statement constitutes harmless error and thus gives no cause for reversal.

3. Both TOLAC and the Colemans contend generally that the Licensing Board erred in concluding (12 NRC at 456) that "[t]he grant of the license amendment requested in this pro-

ceeding is not a major Commission action significantly affecting the quality of the human environment," and thus does not require an EIS. TOLAC Br. at 4-7; Coleman Br. "Exceptions" at 2, "Conclusions" at 1. Intervenors make no real effort, however, to explain on appeal exactly why in their view approval of this proposal to expand Salem's spent fuel pool is such a 'major" federal action.[35/] TOLAC implies that the action is major because it will permit "long-term" storage of spent fuel for the duration of Salem's license. The Colemans note that the proposed license amendment will increase the capacity of the Salem pool more than fourfold. But more than the size and duration of a project must be evaluated when determining whether its federal approval constitutes a major action with a significant environmental impact.

In order to make that evaluation, the precise federal action involved must be defined.[36/] Here the proper focus of the inquiry is the incremental effect on the environment occasioned by the proposed license amendment. Portland General Electric Co. (Trojan Plant), ALAB-531, 9 NRC 263, 266 n.6 (1979);

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35/ The exception to this statement is, as we noted earlier, TOLAC's apparent argument that the possibility of a gross loss of water makes this a major action. For the reason set forth in note 29, supra, we rejected this assertion.

36/ See Aberdeen & Rockfish R.R. v. SCRAP, 422 U.S. 289, 322 (1975).

Northern States Power Co. (Prairie Island Plant, Units 1 and 2), ALAB-455, 7 NRC 41, 46 n.4 (1978), remanded in part on other grounds, Minnesota v. NRC, 602 F.2d 412 (D.C. Cir. 1979). [37/] The EIA concluded -- after a detailed analysis of all aspects of the proposal, including the substantial increase in the number of assemblies it would permit and the extension of storage capability through 1993 or 1996 -- that "there will be no significant environmental impact attributable to the proposed action other than that which has already been predicted and described in the Commission's Final Environmental Statement for the Facility dated April 1973." Exhibit 6-C, EIA at 27. The staff therefore determined that a full EIS need not be prepared. Ibid. In agreeing with this finding, the Licensing Board correctly observed, "[n]one of the testimony or cross-examination by intervenors or interested states showed that the Staff's conclusion was incorrect, or that the evidence supporting that conclusion was inadequate." 12 NRC at 456-457.

TOLAC, in fact, affirmatively refused to litigate in this administrative proceeding the unspecified deficiencies it perceived in the EIA (with the exception of its challenge

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37/ See note 24, supra.

to the adequacy of the consideration of alternatives). App. Tr. 24-27. This was so despite the fact that the Commission's regulations clearly permit and encourage parties to challenge the admission and content of the staff's EIA at hearing. 10 C.F.R. 51.52(d). Yet TOLAC now boldly argues that it has been deprived of its procedural rights under NEPA. App. Tr. 62. And, through this appeal, it intimates that it is finally ready to litigate still largely unidentified and unparticularized deficiencies it sees in the EIA and seeks to overturn the Licensing Board's thorough, well-reasoned decision. The Supreme Court's comments in Vermont Yankee, supra, 435 U.S. at 553-554, on the similar conduct of an intervenor in another NRC proceeding provide a particularly appropriate response to TOLAC:

> [A]dministrative proceedings should not be a game or a forum to engage in unjustified obstructionism by making cryptic and obscure reference to matters that "ought to be" considered and then, after failing to do more to bring the matter to the agency's attention, seeking to have that agency determination vacated on the ground that the agency failed to consider matters "forcefully presented." In fact, here the agency continually invited further clarification of Saginaw's contentions. Even without such clarification it indicated a willingness to receive evidence on the matters. But not only did Saginaw decline to further focus its contentions, it virtually declined to participate, indicating that it had "no conventional findings of fact to set forth" and that it had not "chosen to search the record and respond to this proceeding by submitting citations of matter which we believe were proved or disproved."

Intervenors also show a misapprehension of the evidence upon which the Licensing Board based its conclusion that this proposal would not have a significant impact on the environment. They believe that the Board "relied on" the Final Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Power Reactor Fuel, NUREG-0575 (August 1979), and its predecessor draft statement, NUREG-0404 (March 1978). The Board, however, explicitly stated that it based its conclusion on "the record of this proceeding, particularly the evidence supporting the Staff's [EIA]." 12 NRC at 456.[38] Neither NUREG-0575 nor NUREG-0404 was admitted as part of the record in this case. The Board simply "note[d]" that the staff had published NUREG-0575 in August 1979, and the former in no way purported to rely on it. Id. at 457.[39]

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38/ The August 1979 generic EIS embodied in NUREG-0575 does not even apply to this proceeding. Instead, the January 1979 EIA addressed five factors identified by the Commission for consideration "during the period required for preparation of the generic statement." See "Intent to Prepare Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Power Reactor Fuel," 40 Fed. Reg. 42801, 42802 (September 16, 1975). As the Board pointed out, none of the five factors was the object of any controversy or evidence at the hearing. 12 NRC at 457.

39/ TOLAC suggested at oral argument (App. Tr. 22-23) that, as a matter of policy, the Commission has determined that no spent fuel pool expansion could have a significant impact on the environment. We know of no such policy, and the EIA here, which is devoted to an analysis of the particular features of the Salem pool, belies the existence of such a policy. Of course, if this policy did exist, there would have been no need for the staff to have prepared an EIA or for the Licensing Board to have made a NEPA finding in this case. Even the generic EIS, NUREG-0575, which represents final Commission action as of February

(FOOTNOTE CONTINUED ON NEXT PAGE)

In our view, the Licensing Board's conclusion that approval of the Salem spent fuel pool expansion is not a major action significantly affecting the environment is fully consistent with the record. The intervenors had every opportunity to demonstrate otherwise but failed to do so. We therefore have no basis for overturning the Board's NEPA finding on that score. See Prairie Island, ALAB-455, supra, 7 NRC at 45.

4. Finally, the Colemans make oblique arguments as to the need for an environmental assessment of the alleged long-term storage of spent fuel at Salem beyond the expiration of the Unit 1 license. See Coleman Br. "Introduction" at 1, "Findings of Fact" at 1, "Exceptions" at 2.[40/] Their contention 7, which the Licensing Board dismissed and later refused to reinstate, raised this precise issue. LBP-80-10, supra, 11 NRC at 337-338. The Board noted that the Commission was pursuing long-term on-site storage in an ongoing rulemaking and that it would be "contrary to the Commission's Policy" to entertain the Colemans' contention 7. Id. at 338.

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39/ (FOOTNOTE CONTINUED FROM PREVIOUS PAGE)
27, 1981 (46 Fed. Reg. 14506), and now applies to spent fuel pool expansion cases, states that "[b]ecause there are many variations in storage pool designs and limitations caused by spent fuel already in some pools, the licensing reviews must be done on a case-by-case basis." NUREG-0575, Vol. 1, 8-1.

40/ Contrast this argument with that of TOLAC, concerning "long-term" storage for the duration of Salem's operating license. See p. 42, supra.

We agree. The court in Minnesota v. NRC, 602 F.2d 412 (D.C. Cir. 1979), specifically authorized the Commission to explore this matter in a rulemaking. Accordingly, the Commission instituted its pending "Waste Confidence" proceeding.[41] The Colemans' complaints about the possible long-term storage of spent fuel at Salem thus amount to a collateral attack on that rulemaking, and we cannot properly entertain them here. North Anna, supra, 11 NRC at 463-465.

D

The Colemans devote most of their brief to essentially procedural objections to the conduct of the proceeding below.[42] The relevance of any of their points to the Licensing Board's ultimate decision is not evident. More importantly, the Colemans raise these arguments for the first time on appeal; their counsel did not pursue any of these matters either during the hearing or in the Colemans' proposed findings and conclusions. Consequently, the Licensing Board had no opportunity to address

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41/ TOLAC is a participant in that proceeding. App. Tr. 28.

42/ Among these many objections are the following: "exclusion" from the record of certain letters by Robert M. Crockett (PSE&C employee), Brian K. Grimes (NRC employee), and F.P. Gibrizzi (NRC employee); failure of the Board to address matters discussed in a limited appearance statement by Michael DiBernardo; the Colemans' "exclusion" from an in camera hearing concerning proprietary information of Exxon; the Board's denial of certain of the Colemans' interrogatories; the Board and staff's "ignoring" some "reportable occurrences" (FOOTNOTE CONTINUED ON NEXT PAGE)

their arguments. As we pointed out earlier in this opinion (see p. 8, supra), in the absence of "a serious substantive issue," we will not entertain arguments raised for the first time on appeal. Hartsville, ALAB-463, supra, 7 NRC at 348.

We have carefully considered the Colemans' myriad objections not already discussed in this opinion. We find that they raise no serious substantive issues affecting the Licensing Board's decision on either health and safety or environmental matters. Indeed, many of these objections are wholly without basis in fact or law. Moreover, we find no denial of the Colemans' procedural rights or other error requiring corrective action.

III

For the foregoing reasons, the October 27, 1980, initial decision of the Licensing Board is affirmed.

It is so ORDERED.

FOR THE APPEAL BOARD

C. Jean Bishop
Secretary to the
Appeal Board

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42/ (FOOTNOTE CONTINUED FROM PREVIOUS PAGE) at Salem in 1979 and 1980, including a leak in the spent fuel pool; and the Board's conclusion, in connection with the Three Mile Island questions it raised (12 NRC at 449), that staff testimony cured an uncertainty about the post-accident level of radiation in the TMI spent fuel pool area.