

NUCLEAR REGULATORY COMMISSION ISSUANCES

OPINIONS AND DECISIONS OF THE NUCLEAR REGULATORY COMMISSION WITH SELECTED ORDERS

January 1, 1982—April 30, 1982

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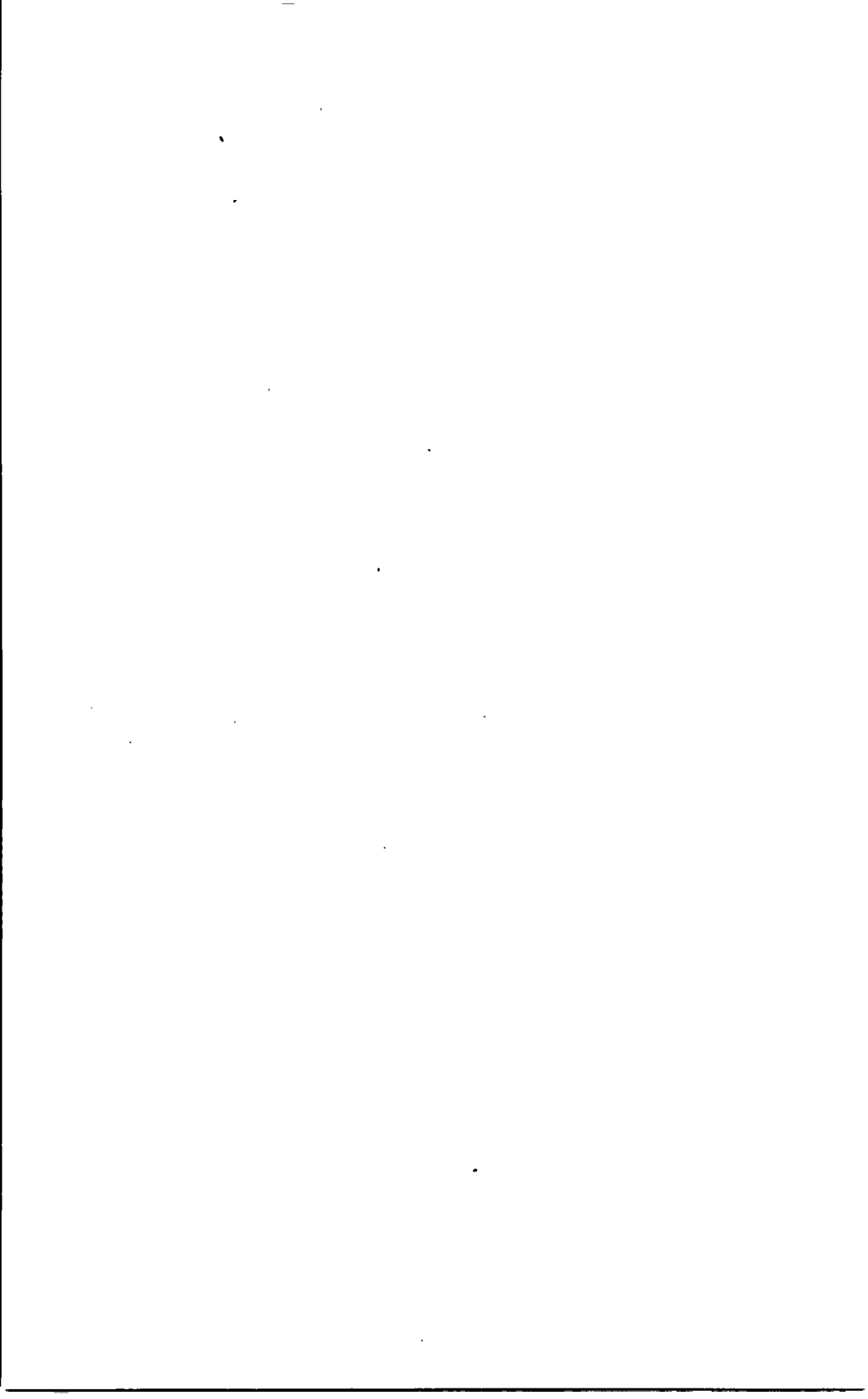
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PREFACE

This is Book I of the fifteenth volume of issuances (1-1093) of the Nuclear Regulatory Commission and its Atomic Safety and Licensing Appeal Boards, Atomic Safety and Licensing Boards, and Administrative Law Judge. It covers the period from January 1, 1982 to April 30, 1982.

Atomic Safety and Licensing Boards are authorized by Section 191 of the Atomic Energy Act of 1954. These Boards, comprised of three members conduct adjudicatory hearings on applications to construct and operate nuclear power plants and related facilities and issue initial decisions which, subject to internal review and appellate procedures, become the final Commission action with respect to those applications. Boards are drawn from the Atomic Safety and Licensing Board Panel, comprised of lawyers, nuclear physicists and engineers, environmentalists, chemists, and economists. The Atomic Energy Commission first established Licensing Boards in 1962 and the Panel in 1967.

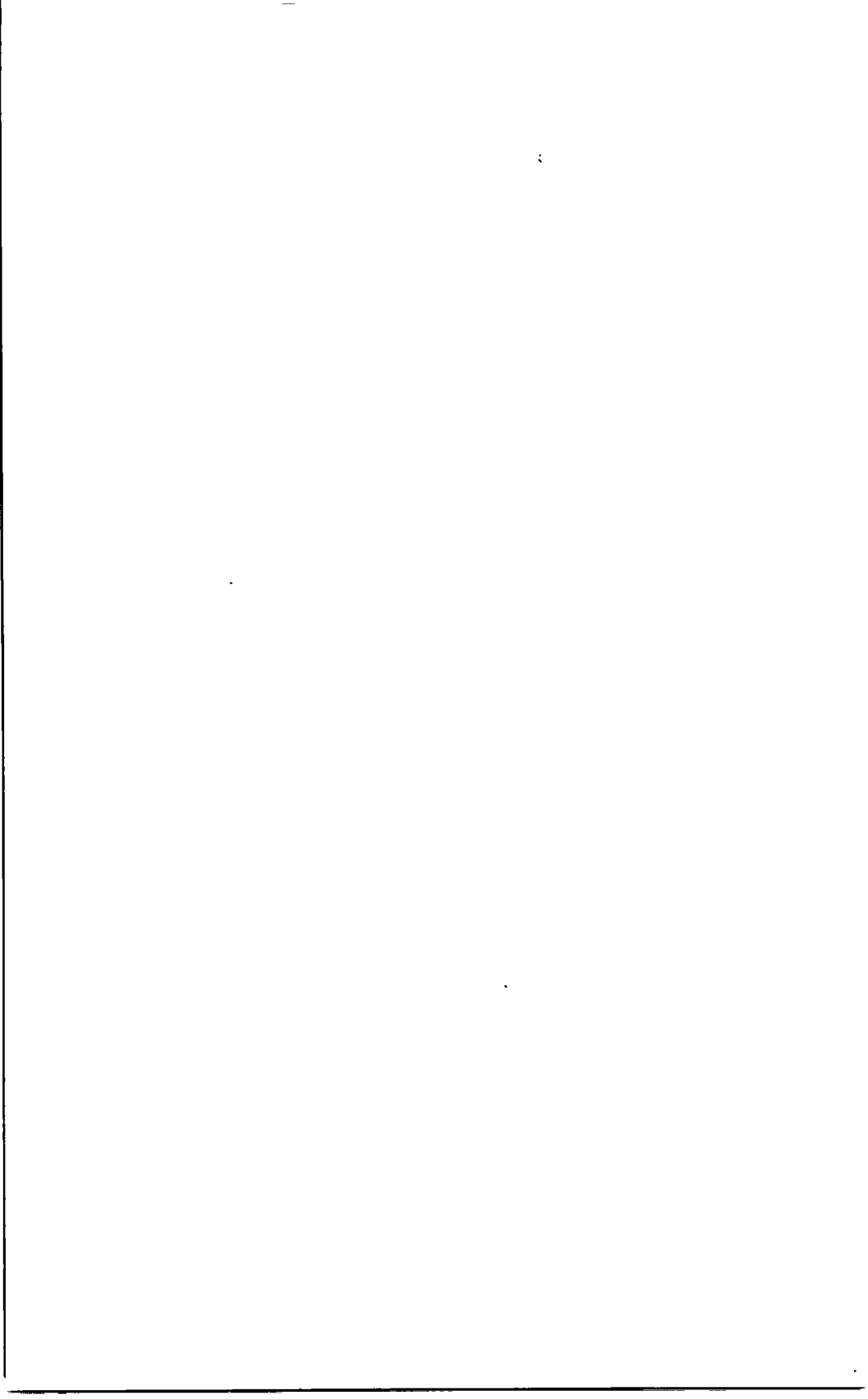
Beginning in 1969, the Atomic Energy Commission authorized Atomic Safety and Licensing Appeal Boards to exercise the authority and perform the review functions which would otherwise have been exercised and performed by the Commission in facility licensing proceedings. In 1972, that Commission created an Appeal Panel, from which are drawn the Appeal Boards assigned to each licensing proceeding. The functions performed by both Appeal Boards and Licensing Boards were transferred to the Nuclear Regulatory Commission by the Energy Reorganization Act of 1974. Appeal Boards represent the final level in the administrative adjudicatory process to which parties may appeal. Parties, however, are permitted to seek discretionary Commission review of certain board rulings. The Commission also may decide to review, on its own motion, various decisions or actions of Appeal Boards.

The Commission also has an Administrative Law Judge appointed pursuant to the Administrative Procedure Act, who presides over proceedings as directed by the Commission.

This volume is made up of pages from the six monthly issues of the Nuclear Regulatory Commission publication *Nuclear Regulatory Commission Issuances (NRCI)* for this period, arranged in chronological order. Cross references in the text and indexes are to the NRCI page numbers which are the same as the page numbers in this publication.

Issuances are referred to as follows: Commission--CLI, Atomic Safety and Licensing Appeal Boards--ALAB, Atomic Safety and Licensing Boards--LBP, Administrative Law Judge--ALJ, Directors Denial--DD, and Denial of Petition for Rulemaking--DPRM.

The summaries and headnotes preceding the opinions reported herein are not to be deemed a part of those opinions or to have any independent legal significance.



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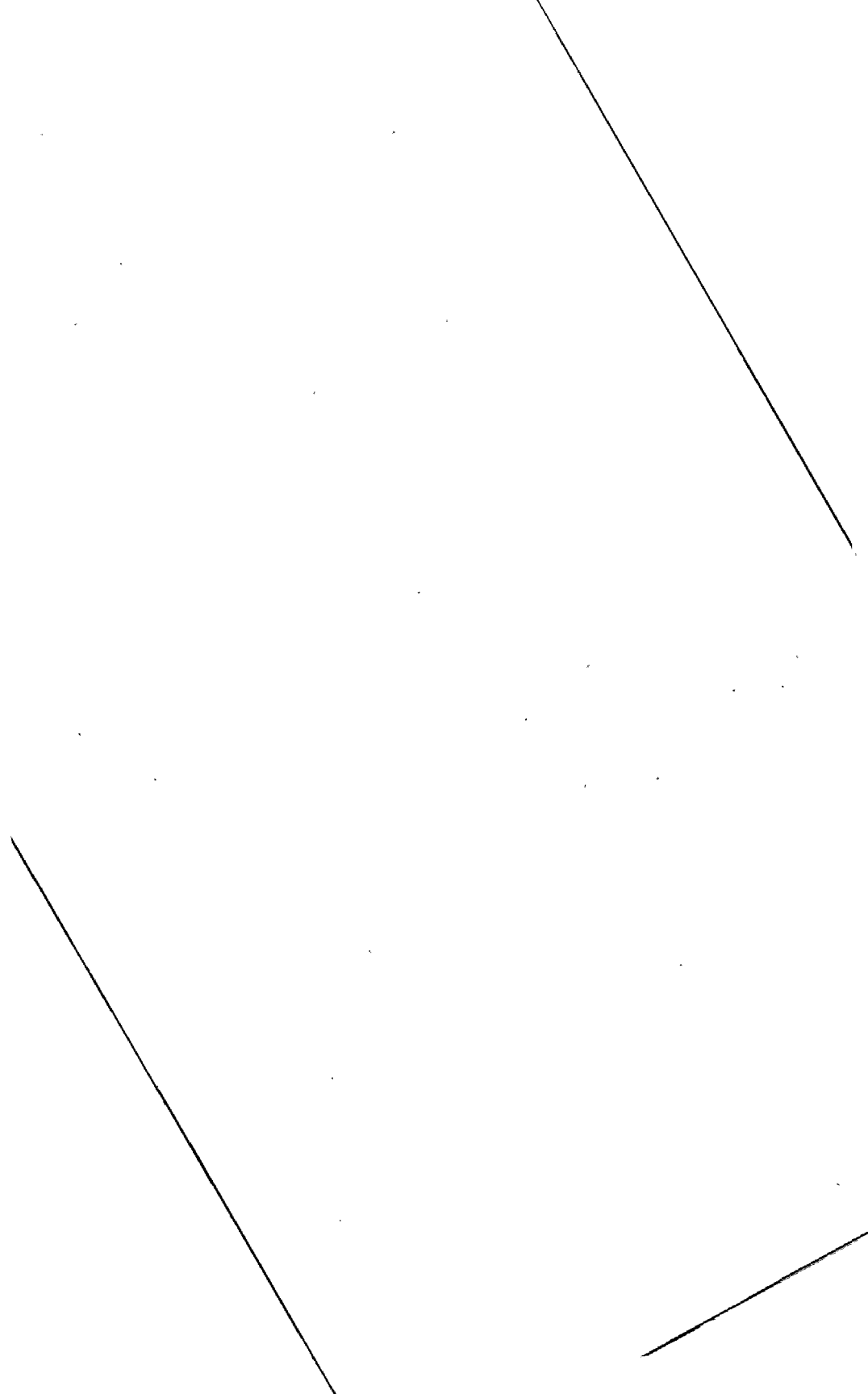
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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Stephen F. Ellperin, Chairman
Dr. John H. Buck
Gary J. Edles

In the Matter of

Docket Nos. 50-259 OL
50-260 OL
50-296 OL

TENNESSEE VALLEY AUTHORITY
(Browns Ferry Nuclear Plant,
Units 1, 2 and 3)

January 6, 1982

In this proceeding to amend the Browns Ferry operating license to permit onsite storage of low-level radioactive waste for a five-year period, the Appeal Board vacates the Licensing Board's October 2, 1981 decision, LBP-81-40, 14 NRC 828, denying certain petitions for intervention and associated requests for hearing. The Appeal Board reinstates the petitions and requests for hearing, and remands the proceeding to the Licensing Board with directions to rule on the petitions and requests after receipt of the staff's environmental assessment of the proposed amendments because it cannot yet be determined whether a litigable contention has been raised.

NEPA: SCOPE OF ENVIRONMENTAL ANALYSIS

In the instance of a segmented non-federal waste disposal plan, the Commission may confine its scrutiny to the portion of the plan for which approval is sought *so long as* (1) that portion has independent utility; and (2) as a result, the approval does not unduly circumscribe the Commission's ability to withhold approval of subsequent portions of the overall plan at a later stage. Duke Power Co. (Amendment to Materials License SNM-1773 — Transportation of Spent Fuel from Oconee Nuclear Station for Storage at McGuire Nuclear Station), ALAB-651, 14 NRC 307 (1981).

NEPA: SCOPE OF ENVIRONMENTAL ANALYSIS

Economic cost of waste disposal is an element to be considered in determining the issue of independent utility of a segmented portion of an overall waste storage plan. *Consumers Power Co.* (Midland Plant, Units 1 & 2), ALAB-458, 7 NRC 155 (1978).

NEPA: JURISDICTION

A licensee which is a federal agency has environmental responsibilities under NEPA which are separate and may be different from those of the Commission. *Duke Power Co.* (Amendment to Materials License SNM-1773 — Transportation of Spent Fuel from Oconee Nuclear Station for Storage at McGuire Nuclear Station), ALAB-651, 14 NRC 307, 312 (1981). If a petitioner wishes to challenge such a licensee's compliance with its separate environmental responsibilities, it must do so in another forum.

RULES OF PRACTICE: INTERVENTION PETITIONS (GOOD CAUSE FOR LATE FILING)

Substantial delay in providing prospective intervenors with materials requested under the Freedom of Information Act may constitute good cause for the late filing of contentions premised on the belatedly disclosed information.

APPEARANCES

Mr. Robert B. Pyle, Chattanooga, Tennessee, for the petitioners,
David R. Currott, *et al.*

Messrs. Herbert S. Sanger, Jr., Lewis E. Wallace, James F. Burger
and **W. Walter LaRoche**, Knoxville, Tennessee, for the
applicant, Tennessee Valley Authority.

Mr. Richard J. Rawson for the Nuclear Regulatory Commission
staff.

DECISION

Opinion of the Board by Dr. Buck and Mr. Edles:

This proceeding involves an application by the Tennessee Valley Authority (TVA) for amendments to its operating licenses for the Browns Ferry Nuclear Plant in Alabama. The amendments would permit onsite storage of low level radioactive waste (LLRW) for a five year period.¹

Petitions to intervene, accompanied by requests for a hearing, were filed by various individuals who live near the nuclear facility.² They claim that the application for authority to store the low level waste onsite for a five year period is but the first step in an overall plan by TVA which will include installation of equipment for volume reduction and solidification of waste through incineration and evaporation. The petitioners are chiefly concerned about the likelihood that an incinerator will be built.

In a decision issued October 2, 1981, the Licensing Board denied the petitions for intervention and the requests for hearing. LBP-81-40, 14 NRC 828 (1981). The Board concluded essentially that the five year storage plan had "immediate utility" within the meaning of our decision in *Duke Power Co.* (Amendment to Materials License SNM-1773 — Transportation of Spent Fuel from Oconee Nuclear Station for Storage at McGuire Nuclear Station), ALAB-651, 14 NRC 307 (1981), independent of any decisions that TVA might later reach with regard to incineration, and thus could be considered separately. In this connection, the Board accepted TVA's factual assertion that it had not yet decided whether to pursue any low level waste storage plan other than the five year plan for which approval was explicitly sought. The petitioners appeal. TVA and the NRC staff support the Licensing Board's decision.

We believe the Licensing Board ruled on the petitions to intervene and the requests for hearing prematurely. In our judgment, a definitive ruling on the petitioners' requests must await the filing by the staff of its

¹ This waste consists of materials such as ion exchange and condensate demineralizer resins, and miscellaneous trash, such as laboratory equipment, scrap iron and steel, plastic hose, and coveralls and masks.

² The petitioners, all represented by the same counsel, are David R. Currott, Uvonna J. Currott, Nancy Muse, Hollis Fenn, Richard L. Freeman, Noel M. Beck, and Robert W. Beck of Florence, Alabama; Alice N. Colcock, Betty L. Martin, and John R. Martin of Sheffield, Alabama; and Thomas W. Paul, Richard W. Jobe, Marjorie L. Hall, Gregory R. Brough, Michael D. Pierson, David Ely, Debbie Havas, Rebecca Hudgins, and Tom Thornton of Huntsville, Alabama.

environmental assessment and the opportunity for the petitioners and TVA to comment.³ We therefore vacate the Licensing Board's decision, reinstate the petitions to intervene and the requests for hearing, and remand the proceeding to the Licensing Board for a fresh look and a new decision after receipt of the staff's environmental assessment of the currently requested amendments.

I. Background

At the present time the Tennessee Valley Authority sends its low level radioactive waste to the commercial disposal site at Barnwell, South Carolina. Barnwell is one of only three commercial waste disposal sites now operating and it has recently imposed restrictions on the volume of waste it will accept from various utilities. The disposal space allocated to TVA is gradually decreasing and it has undertaken to make alternate arrangements for managing its low level waste. TVA submitted an application for amendments of its operating licenses for the Browns Ferry facility which would permit it to store low level waste onsite.

As initially filed on July 31, 1980, the application requested authorization to store low level waste for the life of the plant. That request reflected a plan to (1) establish temporary storage areas; (2) install equipment for volume reduction and solidification of waste through incineration and evaporation; and (3) construct facilities to store the waste for the remaining operational life of the plant. TVA's Environmental Assessment, prepared in February, 1980, states:

Although each segment of the LLRW management plan could be implemented independently, each is an integral part of the proposal for . . . [Browns Ferry] and all will be considered together as a single action for the purposes of this document.

Environmental Assessment, p. 1.

At about the time that TVA submitted its application, the Congress was considering (and eventually enacted) the Low-Level Radioactive Waste Policy Act of 1980, P.L. 96-573, 95 Stat. 3347 (December 22, 1980), authorizing groups of states to enter into compacts for the construction and operation of regional low level waste disposal facilities. The staff wished to take no action that might adversely affect state planning for low level waste disposal under the new law and believed that issuance of a license authorizing life of the plant storage might reduce the incentive that individual states have to develop low level waste disposal compacts.⁴ TVA

³ The staff assessment will either be an environmental appraisal, including a negative declaration, or, in due course, a full Environmental Impact Statement. See 10 CFR 51.2.

⁴ See staff's Answer of June 4, 1981, pp. 4-5.

thereafter restructured its application to limit its request to a five year period.⁵ The staff nonetheless decided to address the environmental effects of the original life of the plant storage request as well as the five year storage request covered by the amended application. That environmental assessment is in preparation.

On November 17, 1980, TVA formally amended its application. A notice was published in the Federal Register on December 11, 1980, 45 *Fed. Reg.* 81697, that the Commission had received TVA's request

to authorize the licensee to store onsite the low-level radioactive waste generated from operation of the Browns Ferry Plant for a period of five years.

The petitions for intervention, along with the requests for hearing, were filed in response to the notice. The petitioners raised nine separate contentions.⁶ Their brief to us explains, however:

The subject matter of all nine contentions centered around an allegation that the Tennessee Valley Authority had a long-range plan for low level radioactive waste management which involved the installation of a volume reduction and solidification system including at some point the installation of an incineration system. The Tennessee Valley Authority denied the existence of such a plan.

It is the Petitioners' position basically that the failure of the Tennessee Valley Authority to include their entire plan within their assessment constituted illegal segmentation of their plan and hence, a violation of NEPA. Petitioners' entire case hinges on the existence of this plan and the existence of this plan is a factual assertion subject to proof.

Petitioner's Brief, pp. 1-2.

As noted above, the Licensing Board's decision denying the requests for intervention determined essentially that the five year storage plan had "immediate utility" independent of any decisions that TVA might later reach with regard to volume reduction and solidification or life of the plant storage. In this connection, the Board found that the licensing of further waste management techniques was not an unavoidable consequence of permitting low level waste storage for the requested five year period. The Board observed that the petitioners had not seriously questioned the five year storage plan which is the subject of the application and concluded

⁵See TVA's brief, p. 5.

⁶ Only the first four contentions were timely filed. The Licensing Board nonetheless considered all nine without deciding the question of timeliness. On appeal, the petitioners press only contentions 1, 3, 4, 5 and 9. The Licensing Board also noted, but did not rule upon, TVA's argument that the petitioners lack standing to intervene. We do not reach any of these issues and the Licensing Board is free, on remand, to consider them.

that the hearing requirement would "come into play" if TVA later sought approval for any additional onsite waste management technique, such as the volume reduction and solidification plan. The Board denied the requests for hearing because no litigable issues had been raised regarding the five year storage plan itself.

The Board concluded, in addition, that certain contentions were either too vague or raised issues beyond the Commission's jurisdiction. The only contention not related to the volume reduction and solidification operation is Contention 9, which reads:

The environmental impacts of TVA's proposal for five year LLRW storage, if considered without regard to the rest of its LLRW management plan, are not adequately discussed in the EA or the attachments to TVA's main application dated July 31, 1980 because there is a failure to consider the costs of decommissioning of the storage modules or other long term disposition of the LLRW at the conclusion of the five year storage.

The Board dismissed the contention in part on the ground that economic costs are not a proper subject of an environmental evaluation. It noted, as well, that the contention was improperly directed to TVA's environmental conclusion that the storage plan was not a major Federal action, a determination which was not the subject of this proceeding. Finally, the Board observed that the petitioners failed to indicate either what sort of costs should be considered or why such consideration is necessary.

II. Summary

We are not prepared to affirm dismissal of the petitioners' contentions regarding the waste reduction and solidification plan at this threshold stage. Rather, we believe the issue of the independent utility of the five year storage proposal, and thus whether the petitioners have set out a litigable contention, cannot be decided in advance of the receipt of the staff's environmental assessment which will evaluate the options available to TVA at the end of the five year term of the license. We also believe that the Licensing Board must await TVA's comments on what options it would — or could — pursue at the end of the five year period. Finally, we think the petitioners are entitled to an opportunity to address the independent utility of the five year storage plan in light of the staff's environmental conclusions.

We turn first to a discussion of our views on the issue of independent utility. We then offer some comments on other issues in the interest of expediting the case on remand.

III. Independent Utility

A. General Considerations

The major question underlying disposition of the petitions to intervene is whether a sufficient nexus exists between the five year storage plan that is the subject of the application before us, and the incinerator system, to require consideration of that system in connection with the instant application. We recently had occasion to address the environmental implications of a multi-step plan in *Oconee-McGuire, supra*. We pointed out:

In the instance of a segmented non-federal plan, NEPA does not impose an inflexible requirement that the entire plan receive an environmental assessment at the time that the first segment is put before a governmental agency for licensing action. Rather, it is settled that the agency may confine its scrutiny to the portion of the plan for which approval is sought *so long as* (1) that portion has independent utility; and (2) as a result, the approval does not foreclose the agency from later withholding approval of subsequent portions of the overall plan. See *e.g., Atlanta Coalition v. Atlanta Regional Commission*, 599 F.2d 1333 (5th Cir. 1979); *Swain v. Brinegar*, 542 F.2d 364 (7th Cir. 1976); *Sierra Club v. Froehlke*, 534 F.2d 1289 (8th Cir. 1976); *Trout Unlimited v. Morton*, 509 F.2d 1276 (9th Cir. 1974); *Indian Lookout Alliance v. Volpe*, 484 F.2d 11 (8th Cir. 1973). As summarized by the Eighth Circuit in *Froehlke*, 534 F.2d at 1297:

The courts have been presented with the issue of "segmentation" of impact statements in various contexts and we do not propose to attempt the impossible, namely, the enunciation of a general rule that will cover all cases. The crucial dependence is upon the facts before the court in the particular case *sub judice*. Where it is found that the project before the court is an essentially independent one, an EIS for that project alone has been found sufficient compliance with the act. In such case there is no irretrievable commitment of resources beyond what is actually expended in an individual project.

14 NRC at 313.

As the *Oconee-McGuire* decision indicates, we must determine whether the five year storage request has independent utility; stated differently, we must decide whether the request is genuinely segregable or whether its approval will unduly circumscribe the Commission's ability to withhold approval of subsequent portions of an overall plan at a later stage.

B. The Instant Case

We cannot determine on the present record whether the temporary five year storage plan has independent utility. We recognize that there are certain indicia of independence manifested by the plan. To begin with, TVA asserts, and the petitioners do not dispute, that there will be a need for some substitute storage facilities to insure continued operation of the plant in the event the use of the commercial storage facility at Barnwell is further restricted. According to TVA's submission, the onsite storage facility will be sufficient for non-volume reduced waste during the initial five year period.⁷ Given the uncertainty over the continued use of Barnwell, it is good business planning for TVA to insure uninterrupted access to some storage facility pending a long term solution of the storage problem. Consequently, the five year storage plan offers a necessary, short term solution to TVA's storage problem.

Equally important, any action in furtherance of a longer term storage solution by TVA would require additional regulatory approval from the Commission. As a matter of procedure, therefore, the petitioners will have a subsequent opportunity to present their concerns regarding incineration if and when TVA eventually submits its applications.

We must also be satisfied, however, that as a practical matter grant of the license amendments covering the five year period will not unduly circumscribe the Commission's decisional alternatives when subsequent applications are submitted. We cannot make that determination on the basis of current information.

To begin with, TVA's evidentiary presentation to date reflects a totally integrated plan which includes incineration. TVA originally submitted a request in which temporary storage, long term storage, and waste reduction and solidification were part of the same proposal. Although, as a matter of regulatory tactics, TVA has now limited its immediate application to the five year temporary storage plan, it has not, as far as we can tell, backed away from its long term objectives.⁸

More important for decisional purposes, it has not explained how the three elements can now be separated. Preliminary indications in the record suggest — although not conclusively — that separation may be difficult. TVA's Environmental Assessment, prepared in February, 1980, argues that there are no alternatives to its program combining long term storage with incineration.⁹ The licensee's amended application, which is the one before

⁷ See Enclosure 3 of TVA's July 31, 1980 application.

⁸ We agree with the petitioners in this regard that the Licensing Board should not have relied on the representations of TVA's counsel as factual support for its conclusion that TVA has not yet formulated a definitive plan for incineration.

⁹ See Environmental Assessment, pp. 13-17.

us, therefore reiterates its intention to seek approval for long term storage, and its construction schedule demonstrates that the number of storage modules it plans to build will be sufficient for long term storage only if the waste is reduced.¹⁰ While we do not suggest that TVA may not have altered its plans, or could not do so in the future, we believe that, before we dismiss the petitioners' contentions, TVA has some obligation to come forward with an explanation on the record of what options — other than incineration — it would, or could, pursue at the end of the five year period.

We likewise have no idea what options will be either feasible or environmentally acceptable at the end of the five year period. These are among the matters now being considered by the staff. It may turn out, of course, that the staff (and perhaps even the petitioners) will be reasonably satisfied that a safe place for offsite permanent storage is likely to be available by the end of the five year term of the license amendments, and that this will be TVA's preferred course of action as well. If so, the temporary storage plan clearly has independent utility. If it is not reasonably probable that an offsite disposal site will be available, however, the staff must decide whether unreduced low level waste can be stored onsite for a longer period in an environmentally satisfactory way (this is precisely what the staff is now doing). TVA must also decide whether such an approach is consistent with its overall waste management objectives. The utility of the five year plan in such circumstances will be subsumed in an analysis of the utility of a life of the plant storage plan.

If the staff, TVA, or the Licensing Board concludes that offsite storage or onsite life of the plant storage of unreduced waste is infeasible or unacceptable, volume reduction and solidification may be inevitable. In such circumstances, as even our dissenting colleague concedes, the five year plan cannot have independent utility and the volume reduction and solidification plan must be examined now, not later. Whether volume reduction and solidification is inevitable cannot be decided in advance of the staff's environmental assessment, as our dissenting colleague also concedes. The petitioners have plainly raised this possibility and would be entitled to intervene and address this issue.

It is interesting, in this connection, that the staff originally planned to evaluate only the environmental implications of retaining the waste for the five year term of the license amendments.¹¹ At the prehearing conference held on April 10, 1981, the staff explained that it had already begun its environmental analysis (Tr. 56) and reiterated its position that its analysis

¹⁰ See Enclosure 3 of TVA's July 31, 1980 application.

¹¹ See staff's Response of April 7, 1981, p. 6, fn. 4.

would cover only the five year storage plan itself (Tr. 41-42, 59). The petitioners submitted Contention 9 as part of their amended contentions dated April 27, 1981. In its June 4, 1981 response to the amended contentions, the staff suddenly reversed its position and announced that it would prepare an environmental assessment covering the life of the plant storage plan originally submitted by TVA.¹² While we agree with the dissent that we need not in the ordinary case defer ruling on an intervention petition until after a staff environmental analysis is prepared, the petitioners' right to intervene in this case may turn on the conclusions reached in the staff analysis. In our judgment, the petitioners are thus entitled to an opportunity to comment on the relationship between that analysis and their petitions to intervene. It also seems anomalous to exclude from the comment process the very people who appear to have prompted consideration of the life of the plant storage issue in the first place.

C. Cost Issues

We believe, contrary to the Licensing Board's suggestion, that the economic cost of waste disposal has a bearing on the issue of the independent utility of the five year plan. In *Consumers Power Co.* (Midland Plant, Units 1 & 2), ALAB-458, 7 NRC 155 (1978), we addressed the issue of the financial costs of various environmental alternatives. We observed that NEPA requires consideration of alternatives that are environmentally preferable to the proposal presented. If those alternatives are environmentally preferable, they must be implemented if that can be accomplished at a reasonable cost. *Id.* at 162. We believe, similarly, that the feasibility of an environmentally preferable option cannot be determined without consideration of its economic costs. We must be reasonably satisfied at this stage that we are not setting in motion a long range program under which volume reduction and solidification will be the only financially acceptable (as well as environmentally acceptable) option at the end of the five year period.

IV. Other Matters

We turn our attention now to three subsidiary issues. First, we wish to make clear that the existence of a long range waste management plan on TVA's part need not necessarily be the subject of an evidentiary hearing. The relevant issue before the Licensing Board is whether, despite TVA's

¹² See staff's Answer of June 4, 1981, pp. 4-5.

expectations, approval of the five year storage plan will prejudice later review of significant issues or unduly circumscribe the Commission's decisional alternatives when subsequent applications are filed. Resolution of that issue may be amenable to summary disposition. TVA, in fact, may, on remand, present workable alternatives other than incineration which will be wholly satisfactory to the petitioners. We leave the decision regarding further procedures to the Licensing Board.

Second, we do not agree with the petitioners' argument that our *Oconee-McGuire* decision, *supra*, permits review of the first phase of a so-called segmented plan only where the applicant is a private power company. The *Oconee-McGuire* decision did suggest that there was decisional significance to the applicant's status as a private company because any overall plan developed with Federal involvement would be a Federal action subject to NEPA analysis. See 14 NRC at 312. It does not follow, however, that the Commission, which was not involved in the development of the overall plan, must analyze it in its entirety in connection with a request to license the initial phase.

TVA, unlike a private power company, has environmental responsibilities under NEPA. If it undertakes a comprehensive plan and makes commitments at the present time, it may have a duty to examine the environmental consequences of its overall action now. That is what the *Oconee-McGuire* decision meant. Our NEPA responsibilities with regard to the same plan are separate, and may be different. See generally *United States Energy Research and Development Administration et al.* (Clinch River Breeder Reactor Plant), CLI-76-13, 4 NRC 67, 76-80 (1976); *Tennessee Valley Authority* (Phipps Bend Nuclear Plant, Units 1 & 2), ALAB-506, 8 NRC 533, 546-549 (1978). If the first phase of the overall plan has genuine independent utility, and we are called upon to license only the first phase, the Commission's NEPA responsibilities can properly be satisfied by an examination of the necessary implications of that phase alone. If the petitioners wish to challenge TVA's compliance with its separate environmental responsibilities, they must do so in another forum. See *Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-493, 8 NRC 253, 267-68 (1978), *Detroit Edison Co.* (Enrico Fermi Atomic Power Plant, Unit 2), LBP-79-1, 9 NRC 73, 85-86 (1979).

In this regard, however, we do not believe that the petitioners' contentions should be rejected solely because they were directed toward TVA's environmental assessment. We treat the contentions as claiming what subjects must be covered in the Commission's environmental evaluation. There is no doubt that certain subjects raised by the petitioners — *e.g.*, the environmental costs of decommissioning and the long term disposition of wastes — must be addressed.

Finally, as noted above, we do not decide either the general issue of standing or the question of timeliness. We note, however, that the April 10 prehearing conference transcript indicates that certain materials had been requested of TVA on January 13, 1981, under the Freedom of Information Act, by Ms. Jeannine Honicker in her capacity as a voluntary researcher for the petitioners. Ms. Honicker advised the Licensing Board that those materials — thousands of pages of documents — had only been released by TVA the day before the prehearing conference (Tr. 33-36). Counsel for TVA did not explain why it took so long to comply with Ms. Honicker's FOIA request. At a minimum, the kind of tardiness displayed here would provide good cause for whatever late filed contentions were premised on the belatedly disclosed information.

V. Conclusion

We offer no views on the ultimate merits of the petitioners' intervention requests or whether further procedures will be necessary. We simply vacate the Licensing Board's decision, reinstate the petitions for intervention and the associated requests for a hearing, and remand the case to the Licensing Board for a new decision. Before the Board makes that decision, however, it must await the submission of the staff's environmental assessment and invite TVA to comment on what options it might later pursue in light of its decision to proceed only with the five year storage plan at this time. The Board must also permit the petitioners to recast their contentions to plead with specificity (i) the respects in which they believe that approval of the five year plan would inevitably lead to operation of the waste reduction and solidification facility, and (ii) why the environmental effects of incineration cannot be adequately considered if and when TVA seeks approval of that aspect of its overall plan. The Licensing Board can then decide whether these revised contentions satisfy the requirements for intervention set out in 10 CFR 2.714.¹³

Remand should not delay ultimate disposition of the case appreciably because final decision must, in any event, await the preparation of a careful environmental document by the staff. It will, however, produce a better record on which to resolve the environmental questions before the Licensing Board. *Cf. Consumers Power Co.* (Big Rock Point Nuclear Plant), ALAB-636, 13 NRC 312, 329-31 (1981).

¹³ Original Contentions 1-5, along with contentions prompted by the staff's environmental assessment, will be considered under the general intervention standards. The Licensing Board may, if it wishes, consider Contentions 6-9 under the standards governing nontimely requests.

The Licensing Board's decision is *vacated*, the petitions for intervention and the requests for hearing are *reinstated*, and the case is *remanded* to the Licensing Board.

It is so ORDERED.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the Appeal Board

Dissenting opinion of Mr. Eilperin:

The majority opinion transmutes an as yet to be written intervention petition into a timely rather than untimely filing, thus eliminating petitioners' burden of showing good cause why they have not produced a single litigable contention to date. This result follows from the majority's faulty premise that an intervention petition is not ripe for ruling because the staff's environmental analysis of the applicant's proposal is not yet complete. The fundamental flaw of that premise, and of the majority opinion as a whole, is that it confuses the obligations of the NRC with the obligations of prospective intervenors.

I.

TVA's proposal in this case is for a five year authorization to store unincinerated low-level waste. Petitioners contend that TVA has a more far reaching plan — to incinerate, solidify, and store low-level waste onsite for the life of the plant — which NEPA requires to be evaluated now. Petitioners' principal, and seemingly exclusive, concern is that TVA will incinerate its low-level waste, causing offsite radioactive releases.¹

The Licensing Board's decision denying the requests for intervention rested principally on two factors. First, the Board found "beyond question" that the five year storage plan had "immediate utility" independent of any decisions that TVA might later reach with regard to volume reduction and solidification, or life-of-plant storage. LBP-81-40, 14 NRC 828, 832 (1981). In this connection, the Board noted that (*ibid.*)

¹ "[I]ncineration is the heart of what [petitioners] fear and have concern about." Prehearing Tr. at 13.

storage of [low level] waste onsite for five years would alleviate the present shortage of available disposal facilities and permit TVA to evaluate its options in light of future developments. Petitioners do not question this proposition.

Second, the Board found that granting the five year storage authority was not likely to prejudice in any way NRC action on future TVA waste management proposals, and that petitioners had not pointed to any possible prejudice.² The Board also observed that, should TVA in the future decide to implement additional onsite techniques such as the incineration system, "an application will have to be filed with NRC and . . . the applicable hearing requirements of the Atomic Energy Act would once again come into play." *Id.* at 832.

Because TVA will not be able to implement the asserted plan without further NRC approval, and petitioners do not quarrel with either the independent utility or consequences of the five year storage plan itself, I would affirm the Licensing Board's denial of the intervention petitions subject to a condition requiring TVA to give the staff and petitioners 60 days notice before beginning construction of any structure planned to house a low-level waste incineration system.

II.

In *Oconee-McGuire*, *supra* p. 3, we reiterated the general proposition that where NRC is presented one aspect of an overall plan, NEPA allows the Commission to confine its scrutiny to the portion for which approval is sought so long as that portion has independent utility and does not prejudice later decisions on subsequent portions of the overall plan. Because petitioners neither contest the independent utility of the five year storage plan nor claim that its approval will prejudice later environmental reviews, it might be thought that our *Oconee-McGuire* decision could dispose of this case. On its face, the five year storage facility is useful no matter what proposals TVA may later advance. It gives TVA five years of uninterrupted access to some storage facility (and thus time to consider a more lasting solution) at a time of constricting offsite disposal possibilities. So too, it is not readily apparent that authorization to store low-level containerized trash in a concrete building will in some fashion restrict NRC's ability to decide five years hence whether that trash should be

² My colleagues contend, without citation (*supra* p. 9), that petitioners have "plainly" raised the possibility that incineration may be an inevitable consequence of five year storage authority. I disagree. Petitioners' complaint is not that incineration is inevitable but that it is planned. See *supra* p. 5. Whatever TVA's plans might be in this regard, they cannot be implemented without NRC's approval.

compacted, incinerated, and solidified, or removed from the building unprocessed.

Two reasons are offered why the *Oconee-McGuire* analysis does not hold for this case — one by petitioners, the other by the majority. Petitioners argue that, because TVA is a federal agency, NRC must do an environmental analysis of the entire waste management plan. We are told that the existence of such a plan (of which incineration is claimed to be an integral part) is a question of fact on which the Licensing Board was obliged to take evidence. The majority, on the other hand, points to the fact that the staff's environmental assessment of the five year storage plan has not yet issued. Because it cannot be known whether this agency thinks the storage plan has utility or is free of prejudicial implications for later decisions until the NRC staff completes its environmental analysis, my colleagues argue that the Licensing Board ruled on the intervention petitions prematurely. A ruling must await the staff's analysis and petitioners' opportunity to contest the analysis.

The majority rightly disposes of petitioners' argument. Assuming that TVA has in fact formulated the long range waste management plan which is of concern to petitioners, the challenge to TVA's compliance with its environmental responsibilities must be brought in a forum other than ours.³

The majority errs, however, in reinstating the intervention petitions based on the fact that the issues of independent utility and possible prejudice to later decisions cannot be decided in advance of the staff's environmental assessment and an opportunity for petitioners to comment on it.

That view confuses the obligations of the NRC with the obligations of prospective intervenors. To be sure, the NRC cannot finally decide the segmentation issues until its environmental analysis has been completed. No matter what issues a prospective intervenor may raise, or fail to raise, NEPA imposes an independent obligation on the NRC to take a hard look at the environmental consequences of its proposed actions. *Natural Resources Defense Council, Inc. v. Morton*, 458 F.2d 827, 838 (D.C. Cir. 1972). It is for this reason, among others, that the Board's denial of the intervention petitions did not result in the issuance of the five year storage authorization requested by TVA. The staff must still complete its environmental analysis. It must still complete its safety review. Prior to license issuance the NRC must first find reasonable assurance that the activities

³ TVA disputes the existence of any such plan. However, if the plan's existence has decisional significance petitioners are surely right that it is a factual matter which could not be decided without taking evidence. Therefore, for purposes of this opinion I assume that TVA's five year storage request is part of a long range low-level waste management plan which contemplates incineration and solidification of the waste at some point.

authorized by the amendment can be conducted without endangering the health and safety of the public, and in compliance with Commission regulations. *Northern States Power Co.* (Prairie Island Nuclear Generating Plant, Units 1 and 2), ALAB-455, 7 NRC 41, 44 (1978). These obligations on the staff are unvarying and independent of whatever contentions a prospective intervenor may seek to raise — indeed, independent of any intervention whatever.

But it does not follow that an intervention petition is not ripe for ruling because the staff's analysis is not yet complete. The practice of the Commission has been just the opposite. Intervention petitions are ruled upon near the outset of the proceeding, well in advance of the completion of the staff's environmental analysis or safety evaluation report. This practice sensibly seeks to settle early on the identity of the parties to the proceeding. See 10 CFR 2.714(b).⁴

The Commission's practice in this regard does not work an unfairness on prospective intervenors. All that is required to support intervention is a demonstration of petitioner's interest and at least one litigable contention set forth with reasonable specificity. 10 CFR 2.714; *Philadelphia Electric Co.* (Peach Bottom Atomic Power Station, Units 2 & 3), ALAB-216, 8 AEC 13, 20-21 (1974). That kind of minimal showing for participation in an NRC licensing proceeding can be expected without recourse to the staff's environmental analysis or safety evaluation report. When those documents are issued more particularized contentions can be framed, and those additional issues litigated. See *Florida Power & Light Co.* (Turkey Point Nuclear Generating, Units Nos. 3 and 4), ALAB-660, 14 NRC 987, 995, 997-98 (1981). See also *Cincinnati Gas and Electric Co.* (William H. Zimmer Nuclear Station) LBP-80-14, 11 NRC 570, 574 (1980).

The majority would excuse petitioners' failure thus far to satisfy the requirement of 10 CFR 2.714, in part because "petitioners' right to intervene in this case may turn on the conclusions reached in the staff analysis." See *supra* p. 10. This cryptic statement seems no more than a bootstrap argument that an intervention petition is not ripe for ruling until the environmental analysis issues and petitioners have an opportunity to comment on it. My colleagues also rely on the asserted fact that petitioners prompted the staff to cover life-of-plant storage in the staff's forthcoming environmental assessment. The argument is both unpersuasive and un-

⁴ The cited section calls for a petitioner's contentions to be filed 15 days prior to the holding of the first prehearing conference. That conference is to be convened within 90 days after the notice of opportunity for hearing, or such other time as the presiding officer deems appropriate. 10 CFR 2.751a. If a petitioner fails to meet the requirements of 10 CFR 2.714(b) with respect to at least one contention, he will not be permitted to participate as a party to the proceeding.

ported. It is unpersuasive because the NRC's NEPA obligations are to assess the foreseeable consequences of TVA's five year storage proposal whatever time period is involved. There is no special merit to studying life-of-plant storage if it is not foreseeable that the consequences of five year storage would extend over the duration of the plant's operating life. The majority's argument is unsupported because the record does not indicate why the staff has chosen to study life-of-plant storage. It is just as reasonable to speculate that the staff thinks TVA will later propose life-of-plant storage and the staff wants to conduct that analysis early, as to assume the analysis was prompted by a contention petitioners failed to pursue. See pp. 18-19 *infra*.

Nor am I persuaded by the majority's argument that reinstating the intervention petitions is appropriate because TVA has not yet come forward with an analysis of what options, other than incineration, it could pursue at the end of the five year period. TVA has in fact already come forward with that analysis. Its November 17, 1980 amended application asserted that TVA could store the wastes for the life of the plant. The analysis supporting that alternative was part of the original July 31, 1980 application which included a description of the proposed low-level radioactive waste storage facility and the safety and environmental aspects of its operation, including the facility's ability to store low-level waste for the 30 year duration of the operating life of Browns Ferry. See Enclosure 2 to July 31, 1980 application: "Long-Term, Low-Level Radiation Waste Storage Facility, Browns Ferry Nuclear Plant."⁵

In this case, had petitioners thought there was a real possibility that five year storage would necessarily lead to incineration of the low-level waste or itself have untoward consequences, they could have framed a contention raising those issues. Petitioners did not claim that the available information was insufficient to formulate a contention along those lines. In fact, the TVA environmental assessment had been issued in February 1980, many months before the notice of hearing in this case, and could have formed a basis for petitioners' critique.⁶ If at this stage petitioners wish their not yet

⁵ The majority contends that TVA's environmental assessment argues there are no alternatives to combining long term storage with incineration. I think the passages relied on by the majority quite plainly mean that, as of February 1980, TVA preferred its asserted long term waste management plan to all others. It most assuredly did not mean that five year storage authority (which was not then part of TVA's proposal) necessarily committed NRC to approve the more far reaching aspects of TVA's asserted plan.

⁶ The April 10, 1981 prehearing conference transcript indicates that petitioners' counsel was familiar with the TVA application and its accompanying environmental assessment. Tr. 15. Other materials had been requested of TVA on January 13, 1981 under the Freedom of Information Act by Jeannine Honicker in her capacity as a voluntary researcher for petitioners.

(CONTINUED)

formulated critique to form the basis for an intervention petition and a request for hearing, I think they should be required to either meet the late filing requirements of 10 CFR 2.714(a) or, if the proceeding has closed, file a 10 CFR 2.206 petition.

It bears reemphasis that none of petitioners' nine contentions asserts that incineration is a necessary consequence of the five year storage authority. There is no claim that the two are factually related, and it is plain from the face of NRC regulations that TVA is legally prohibited from incinerating low-level waste without further NRC approval. 10 CFR 20.305.⁷

III.

In addition to the "segmentation" issue, the majority alludes to the fact that the five year storage plan itself was questioned by petitioners. See

I, like the majority, find disquieting TVA's belated disclosure of information to Ms. Honicker on the eve of the prehearing conference. In the past we have had occasion to remind TVA of counsel's responsibilities in our proceedings. *Tennessee Valley Authority* (Hartsville Nuclear Plant, Units 1A, 2A, 1B and 2B), ALAB-409, 5 NRC 1391, 1393-96 ((1977), *reconsideration denied*, ALAB-418, 6 NRC 1 (1977). I agree with the majority that at minimum the kind of tardiness displayed here would provide good cause for whatever late filed contentions were premised on the belatedly disclosed information. See generally *Renegotiation Board v. Bannerkraft Clothing Co.*, 415 U.S. 1, 18-22 (1974) (pretermittting the question whether a court could enjoin agency proceedings in a non-renegotiation case, but plainly indicating the existence of an agency's power to control its own administrative proceedings).

⁷That section reads:

No licensee shall treat or dispose of licensed material by incineration except as specifically approved by the Commission pursuant to §§20.106(b) and 20.302.

The referenced sections require an application with accompanying safety and environmental analysis, and establish substantive standards for approval. Life-of-plant storage, the other aspect of TVA's asserted plan, would also require new licensing authority.

It is less clear whether construction of the facility to house an incineration system can proceed prior to TVA's license application. If the authorization to incinerate is considered a Part 30 license to receive and possess byproduct material, and if the Commission determines the activity will significantly affect the quality of the environment, then 10 CFR 30.32(f) requires the application to "be filed at least 9 months prior to commencement of construction of the plant or facility in which the activity will be conducted, and shall be accompanied by any Environmental Report required pursuant to Part 51 of this chapter." On the other hand, if construction of the facility to house the incineration system is considered a material alteration of a licensed facility a Part 50 construction permit may be needed prior to construction. See 10 CFR 50.91.

Because petitioners are plainly interested in this aspect of the asserted TVA plan, in order to facilitate the staff's review of these issues and to preserve our power to take appropriate action should that aspect of TVA's asserted plan come before us, I would require TVA to notify petitioners and the staff 60 days before beginning construction of any structure planned to house an incineration system. Cf., *Association of National Advertisers, Inc. v. Federal Trade Commission*, 627 F.2d 1151, 1179 (D.C. Cir. 1979), *certiorari denied*, 447 U.S. 921 (1980).

supra p. 6. None of the original five contentions claimed that approval of five year storage would have untoward consequences.⁸ Of the late filed contentions, only one, contention 9, questioned the impacts of five year storage.⁹ But this subject was not pursued. Petitioners' brief to us is devoted wholly to the proposition that TVA has a long term waste management plan which NEPA obliges the NRC to consider. Not a word of complaint is directed to the five year storage plan itself.

My colleagues would excuse this omission and allow petitioners to litigate the issue if the Licensing Board finds the contention proper on the basis of the guidance offered in the majority opinion. See *supra* n.13. Presumably they are influenced by the fact that the environmental consequences of the five year storage plan are to be considered in the staff's environmental assessment, and petitioners, in their view, should not be obliged to come forth with a litigable contention until that assessment issues. This again confuses the obligations of the staff with the obligations of prospective intervenors. It simply does not follow that a prospective intervenor who has not pursued a contention should be free to litigate in an adjudicatory hearing every issue the staff is obliged to consider. We place too great a burden on ourselves if we hold ourselves out to search the record for an "improperly" denied contention not thought by its proponent to be worth pursuing. I would rule the contention out now. Especially here, where on its face the five year storage plan seems noncontroversial and petitioners' principal (and for all we know exclusive) concern rests elsewhere, we should be hesitant to intrude.

⁸ At the prehearing conference counsel for petitioners specifically disclaimed any complaint about the five year storage of low level waste. ("The petition to intervene does not raise any complaints regarding the 5-year storage aspects"). Tr. 82. He did note, however, that he had not had an opportunity to consult with his clients as to the information TVA belatedly disclosed. I, like the majority, would have been prepared to accept as timely any late filed contention that was based on TVA's late disclosures.

⁹ Contention 9 reads:

The environmental impacts of TVA's proposal for five year LLRW storage, if considered without regard to the risk of its LLRW management plan, are not adequately discussed in the EA or the attachments of TVA's main application dated July 31, 1980 because there is a failure to consider the costs of decommissioning of the storage modules or other long term disposition of the LLRW at the conclusion of the five year storage.

While the contention is directed to TVA's environmental assessment, on whose adequacy NRC does not pass, see *supra* pp. 11, I would treat the contention as claiming what subjects must be covered in the NRC environmental assessment. I agree with the majority that those subjects — the environmental costs of decommissioning and long term disposition of wastes — must be addressed. *New England Coalition on Nuclear Pollution v. Nuclear Regulatory Commission*, 582 F.2d 87, 99 (1st Cir. 1978); *Minnesota v. Nuclear Regulatory Commission*, 602 F.2d 412, 417-418 (D.C. Cir. 1979).

This course of restraint I propose is consistent with our prior practice. We have normally treated unbriefed issues as waived.¹⁰ When we undertake *sua sponte* review of a licensing board decision, our review encompasses the substantive health, safety and environmental issues of record. See, e.g., *Detroit Edison Co.* (Enrico Fermi Atomic Power Plant, Unit 2), ALAB-77, 5 AEC 315 (1972); *South Carolina Electric and Gas Co.* (Virgil C. Summer Nuclear Station, Unit 1), ALAB-114, 6 AEC 253 (1973). We have not previously undertaken *sua sponte* review of licensing board rejection of contentions at the threshold and this case does not seem a particularly useful occasion to alter that settled practice. If the staff's environmental assessment does not measure up to its statutory obligations then the Commission in the exercise of its supervisory power can call on the staff to go further,¹¹ or petitioners themselves may file a 10 CFR 2.206 petition.¹² I do not see why we must hold out the likely assurance of an adjudicatory hearing on a procedural issue not briefed to us.

Lastly, the majority points to the possibility that the staff's environmental assessment might in fact reveal that incineration is a necessary consequence of five year storage. Should that prove to be the case, however, TVA *at that time* would have to seek specific approval for incineration authority pursuant to 10 CFR 20.305, and a new opportunity to request a hearing would be offered which petitioners could invoke. Thus, I am not persuaded by the majority that the possibility that five year storage and

¹⁰ What we have said on the subject is summarized in *Tennessee Valley Authority* (Hartsville Nuclear Plant, Units 1A, 2A, 1B and 2B), ALAB-463, 7 NRC 341, 370 (1978):

As we recently stated in *Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-461, 7 NRC 313, 315 (March 1, 1978):

We have observed before that 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 decisions 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. We do so here. [Footnotes omitted.]

The fact that intervenors adverted to paragraphs 15-107 of their proposed findings and conclusions in support of exception 24 does not save that exception. We have held that a mere statement of reliance upon proposed findings and conclusions does not satisfy the requirement contained in 10 CFR 2.762(a) that a brief in support of exceptions be filed. *Public Service Electric and Gas Co.* (Hope Creek Generating Station, Units 1 and 2), ALAB-394, 5 NRC 769 (1977).

¹¹ See *Virginia Electric and Power Co.* (Surry Nuclear Power Station, Units 1 and 2), CLI-80-4, 11 NRC 405 (1980).

¹² See generally *Northern Indiana Public Service Co.* (Bailey Generating Station, Nuclear 1), ALAB-619, 12 NRC 558, 570 (1980).

incineration might be interrelated precludes us from ruling on the intervention petitions now.

For the reasons stated, I would affirm the October 2, 1981 decision of the Licensing Board as modified by the requirement that TVA notify petitioners and the staff 60 days before beginning construction of any structure planned to house a low-level waste incineration system.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Alan S. Rosenthal, Chairman
Christine N. Kohl
Stephen F. Eilperin

In the Matter of

Docket No. 50-389A

**FLORIDA POWER & LIGHT
COMPANY**

(St. Lucie Plant, Unit No. 2)

January 29, 1982

The Appeal Board affirms a Licensing Board order (LBP-81-28, 14 NRC 333 (1981), *as modified*, LBP-81-41, 14 NRC 839 (1981)), denying a late intervention petition in this antitrust proceeding on the application for construction permit for the St. Lucie 2 plant, for failure to explain how the activities under the license for the plant will have an anticompetitive effect on petitioner's electric generating facility.

ATOMIC ENERGY ACT: SCOPE OF ANTITRUST REVIEW

The antitrust review undertaken by the Commission in licensing the construction of a nuclear power plant is, by statute, to determine "whether the activities under the license would create or maintain a situation inconsistent with the antitrust laws . . ." Section 105c(5) of the Atomic Energy Act of 1954, 42 U.S.C. 2135c(5). This means that the licensed activities must play some active role in creating or maintaining the anticompetitive situation. Put another way, the nuclear power plant must be an actor, an influence, on the anticompetitive scene.

ATOMIC ENERGY ACT: SCOPE OF ANTITRUST REVIEW

The Commission's writ to enforce the antitrust laws does not run to the electric industry generally. Neither does it reach all actions by utilities that generate electricity with nuclear-powered facilities. Rather, Congress

authorized the Commission to condition nuclear power plant licenses on antitrust grounds only where necessary to insure that the activities so licensed would neither create nor maintain situations inconsistent with the antitrust laws. *Detroit Edison Co.* (Enrico Fermi Atomic Power Plant, Unit No. 2), ALAB-475, 7 NRC 752, 756 (1978).

ATOMIC ENERGY ACT: SCOPE OF ANTITRUST REVIEW

The preservation and encouragement of competition in the electric power industry through "fair access to nuclear power" is the principal motivating consideration underlying Section 105c of the Atomic Energy Act. *Detroit Edison Co.* (Enrico Fermi Atomic Power Plant, Unit No. 2), ALAB-475, 7 NRC 752, 757 (1978).

RULES OF PRACTICE: INTERVENTION PETITIONS (ANTITRUST)

The Commission's regulations make clear that an antitrust intervention petition must first describe a situation inconsistent with the antitrust laws; second, a description of a situation inconsistent with the antitrust laws — however well pleaded — accompanied by a mere paraphrase of the statutory language alleging that the situation described therein would be created or maintained by the activities under the license, would be deficient; and third, identify the specific relief sought and whether, how and the extent to which the request fails to be satisfied by the license conditions proposed by the Attorney General. *Kansas Gas and Electric Co.* (Wolf Creek Generating Station, Unit No. 1), ALAB-279, 1 NRC 559, 574-75 (1975).

RULES OF PRACTICE: INTERVENTION PETITIONS (ANTITRUST)

The most critical requirement of an antitrust intervention petition is an explanation of how the activities under the license would create or maintain an anticompetitive situation. *Louisiana Power and Light Co.* (Waterford Steam Electric Generating Station, Unit 3), CLI-73-25, 6 AEC 619, 621 (1973).

Mr. George R. Kucik, Washington, D.C. (with whom **Ms. Ellen E. Sward** and **Mr. James H. Hulme**, Washington, D.C., were on the brief), for the petitioners, **Parsons and Whittemore, Inc.**, and **Resources Recovery (Dade County), Inc.**

Mr. J. A. Bouknight, Jr., Washington, D.C. (with whom Mr. Herbert Dym, Washington, D.C., was on the brief), for the applicant, Florida Power & Light Company).

Mr. Benjamin H. Vogler (with whom Messrs. Joseph Rutberg and Stephen H. Lewis were on the brief) for the Nuclear Regulatory Commission staff.

DECISION

Opinion of the Board by Mr. Eilperin, in which Mr. Rosenthal and Ms. Kohl join:

This case marks the second occasion Parsons and Whittemore, Inc. (P&W), has sought to press its antitrust concerns in connection with the licensing of St. Lucie 2.¹ In *Florida Power & Light Co.* (St. Lucie Plant, Unit No. 2), ALAB-661, 14 NRC 1117 (1981) (*P&W I*), we rejected P&W's petition to intervene at the operating license stage of St. Lucie 2. We ruled that where, as here, the construction permit antitrust review proceeding is still in progress, the antitrust provisions of the Atomic Energy Act preclude the Commission from instituting a second antitrust hearing in conjunction with FPL's operating license application.²

We now affirm the Licensing Board's denial of P&W's late petition to intervene in the construction permit antitrust review proceeding. We do so because P&W has failed to explain, as required by the Atomic Energy Act, how the activities under the St. Lucie 2 license will have an anticompetitive effect on P&W's electric generating facility. Section 105c(5) of the Atomic Energy Act of 1954, 42 U.S.C. 2135c(5); *Louisiana Power and Light Co.* (Waterford Steam Electric Generating Station, Unit 3), CLI-73-25, 6 AEC 619, 621 (1973) (*Waterford II*).

¹ P&W's subsidiary, Resources Recovery (Dade County), Inc. (RRD), joins P&W in this endeavor.

² Our reasoning was as follows: Section 105c(2) of the Atomic Energy Act of 1954, 42 U.S.C. 2135c(2), explicitly states that the construction permit antitrust review shall not be repeated at the operating license stage unless the Commission determines that "significant changes in the licensee's activities or proposed activities have occurred subsequent to the previous review by the Attorney General and the Commission . . ." Where the construction permit antitrust review is ongoing, there necessarily is no "previous" review subsequent to which any "significant changes" could have occurred. We also noted that the Commission has delegated the triggering "significant changes" decision to the NRC staff, and no such decision had been made. *P&W I*, 14 NRC at 1121-22 and n.12.

I.

We draw on our earlier opinion for factual background.

This Commission's consideration of the antitrust aspects of the licensing of Unit 2 of the St. Lucie facility began when Florida Power & Light Company (FPL) filed its application for a construction permit in September 1973. As required by subsection 105c(1) of the Atomic Energy Act of 1954, 42 U.S.C. 2135c(1), the Commission referred the application to the Attorney General of the United States for his antitrust review. On November 14, 1973, the Attorney General advised the Commission by letter that he did not, at that time, recommend holding an antitrust hearing. The Commission published the Attorney General's advice in the Federal Register, but nonetheless invited interested parties to petition to intervene and request a hearing on the antitrust aspects of FPL's construction permit application. 38 *Fed. Reg.* 32159 (November 21, 1973). No such petition was filed during the time specified in the notice, and, thus, no antitrust hearing was instituted.

Four years later, however, Florida Cities requested such a hearing. Having demonstrated good cause for failing to do so in a timely manner, they were granted an antitrust hearing before a specially convened licensing board. LBP-77-23, 5 NRC 789, *affirmed*, ALAB-420, 6 NRC 8 (1977), *affirmed*, CLI-78-12, 7 NRC 939 (1978). That hearing is still in progress.

On March 9, 1981, the Commission published a notice of opportunity for hearing on FPL's recently filed application for a license to *operate* Unit 2. 46 *Fed. Reg.* 15831. On April 7, P&W filed a petition to intervene and request for a "limited antitrust" hearing [footnotes omitted; emphasis in original].

P&W I, supra, 14 NRC at 1119-20.

When FPL opposed that operating license stage petition on the ground that the Licensing Board had no jurisdiction over the asserted antitrust claims (a position we later upheld in *P&W I*), P&W filed a similar petition in this ongoing construction permit antitrust review. Its petition concerned primarily the antitrust implications of a proposed settlement agreement negotiated in this proceeding.³

³ The settlement agreement, which was negotiated among the Department of Justice, the NRC staff, and FPL, was accepted by the Licensing Board in an unpublished memorandum and order issued April 24, 1981. The Board's order made the settlement license conditions effective immediately, allowed the nonsettling parties, Florida Cities, to proceed with their antitrust claims against FPL, and left open the possibility that more stringent (but no lesser) antitrust conditions could be imposed after hearing.

P&W explained that it had recently completed construction of a solid waste processing facility in Dade County, Florida, which was capable of processing 18,000 tons of solid waste (or garbage) per week, converting the combustibles to fuel, and burning the fuel to create steam. In conjunction with the solid waste processing facility P&W had constructed a 76 megawatt electrical (MWe) generator to use the steam. P&W asserted that its electric generator facility was a qualifying small power producer within the meaning of the Public Utilities Regulatory Policies Act of 1978, ("PURPA"), Pub. L. No. 95-617, 92 Stat. 3117 (found in scattered sections of Titles 15, 16, 30, 42 and 43 of the United States Code) — an Act intended to encourage the generation of electric energy through unconventional means by small power producers.⁴ Its ability to become commercially viable, and thus to fulfill Congress' expectation that PURPA facilities contribute to the overall energy independence of the nation, depended, said P&W, upon its ability to compete with entrenched utilities such as FPL.

P&W claimed that FPL had monopoly power over the transmission grid that spans southern and eastern Florida and had used that monopoly power in refusing to wheel power for P&W.⁵ According to P&W, the settlement agreement negotiated among the Department of Justice, the NRC staff, and FPL in this construction permit antitrust review proceeding (*supra* n.3) poses a competitive threat because the settlement provisions diminish qualifying facilities' benefits under PURPA, thereby further limiting P&W's access to FPL's transmission grid and adversely affecting P&W's ability to compete with FPL in the sale of electric power. In particular, P&W complained that the settlement conditions fall short of a "clean" wheeling provision (that is, wheeling upon P&W's request) and allow FPL excessive discretionary latitude to deny PURPA facilities access to FPL's transmission grid.⁶ P&W's petition went on to detail why it believed it

⁴ Toward that end PURPA grants qualifying facilities the right, in accordance with Federal Energy Regulatory Commission (FERC) regulations, to sell their output to an electric utility, to interconnect with a utility, and to buy at retail from the utility the electric power the facility needs. 16 U.S.C. 824a-3. See generally 18 CFR Part 292.

⁵ "Wheeling" is the "transfer, by direct transmission or displacement, [of] electric power from one utility to another over the facilities of an intermediate facility." *Otter Tail Power Co. v. United States*, 410 U.S. 366, 368 (1973).

⁶ For example, P&W pointed to the proviso in Section X(b) of the settlement conditions that nothing in the license will require FPL to wheel to or from a retail customer. Because P&W expected to be a retail customer of FPL and claimed that as a PURPA facility it had a right to make such purchases, P&W argued that the settlement conditions could be construed by FPL to deny it and its customers transmission access. P&W also pointed to Section X(a)(5) which obliges FPL to wheel for PURPA facilities only if the facility's customer agrees to sell the PURPA facility backup and maintenance power during the time and to the extent of its purchases from the PURPA facility. P&W argued that this provision conflicted with a PURPA facility's right to have the principal utility, here FPL, provide backup and main-

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satisfied the late filing requirements of 10 CFR 2.714(a)(1) despite the fact that the time to intervene had expired more than seven years earlier.⁷

FPL and the staff opposed P&W's late intervention petition. First, FPL argued that P&W was not a qualifying PURPA facility and thus had no interest in the antitrust review proceeding. According to FPL, P&W had a contractual commitment to turn over the solid waste processing facility and the 76 MWe generator it had constructed to Dade County. (In turn, Dade County was to transfer the generator to FPL to own and operate.) P&W also had committed to a long-term contract to operate the solid waste processing facility for Dade County. FPL claimed that P&W had breached those commitments when P&W realized it would lose large sums of money under its contract with Dade County to operate the solid waste processing facility. Second, FPL argued that the settlement license conditions of which P&W complained could, as a matter of law, neither create or maintain a situation inconsistent with the antitrust laws nor diminish P&W's asserted PURPA rights, because the license conditions imposed no obligations on anyone other than FPL. For the same reasons, FPL argued that P&W had not shown a meaningful tie or nexus between the activities under the nuclear license and the allegedly anticompetitive situation. Lastly, FPL argued that P&W's intervention petition failed to meet NRC standards for late intervention.⁸ In very general terms, the staff also argued against granting the intervention petition.⁹

tenance power upon request. See *Brief of Resources Recovery (Dade County), Inc. and Parsons & Whittemore, Inc., in Support of Their Petition for Leave to Intervene and Request for an Antitrust Hearing* (filed April 7, 1981) at 18-20 (OL Brief) (incorporated by reference in P&W's construction permit antitrust intervention petition).

⁷ P&W claimed it had good cause for late intervention because only when it unearthed the settlement (apparently in March, 1981) did it realize FPL was utilizing the construction permit antitrust review proceeding assertedly to undercut P&W's rights as a qualifying PURPA facility. P&W also claimed that no other means besides intervention in the NRC antitrust review was adequate to protect against FPL's monopoly power; that it alone was in a position to develop a sound record as to the effect of the settlement agreement on PURPA facilities; and that intervention would not delay the proceeding because the impact of the settlement agreement was already an issue before the NRC.

⁸ FPL's arguments were as follows: good cause was lacking because the settlement agreement to which it was tied was irrelevant; petitioner's asserted interest as a PURPA facility could adequately be protected by the Federal Energy Regulatory Commission; its participation here would not assist NRC in developing a sound record on the antitrust claims before it; inquiry into the evolving relationship between FPL and asserted PURPA facilities would broaden the issues, delay the proceeding, and require NRC to resolve the commercial dispute which surrounded the solid waste disposal facility. See *Partial Response of Florida Power & Light Company in Opposition to "Petition for Leave to Intervene and Request for Hearing" Filed Out of Time by Parsons & Whittemore, Inc. and Resources Recovery (Dade County), Inc.* (filed June 26, 1981).

⁹ See Tr. 60-69 (July 20, 1981). The staff did not have an opportunity to brief its position because the Licensing Board issued its ruling on P&W's intervention petition before full briefing.

In a memorandum and order issued August 5, 1981, the Licensing Board denied P&W's intervention petition, but granted it conditional *amicus* status to present legal arguments concerning the appropriateness of granting relief to PURPA facilities if the Board should find that a situation inconsistent with the antitrust laws existed in connection with Florida Cities' antitrust objections to the licensing of St. Lucie 2. LBP-81-28, 14 NRC 333. The Board found that in each particular P&W failed to satisfy the requirements for late intervention. See 10 CFR 2.714(a)(1). The Board also ruled, as a separate and independent matter, that P&W failed to meet the Commission's nexus requirement of alleging a meaningful tie between the operation of St. Lucie 2 and the anticompetitive situation complained of by P&W. Thereafter, in a memorandum and order issued October 2, 1981, the Licensing Board adhered to its ruling denying intervention. LBP-81-41, 14 NRC 839.

This appeal followed. We affirm the Licensing Board on its nexus ruling and do not reach its alternative holding.

II.

P&W's intervention petition is fundamentally deficient in failing to explain how the operation of St. Lucie 2 will have an anticompetitive effect on P&W's generating facility. For us to exercise jurisdiction over P&W's antitrust claims, the existence of that tie is essential. Because P&W has failed to demonstrate such a nexus here, we affirm the denial of its intervention petition.¹⁰ We begin by recounting the NRC's nexus requirement, then turn to P&W's allegations and an analysis of why those allegations do not satisfy the governing criteria.

A. The Nexus Requirement

When licensing the construction of a nuclear power plant, the antitrust review undertaken by the Commission is, by statute, to determine "whether the activities under the license would create or maintain a situation inconsistent with the antitrust laws"¹¹ We and the Commission have explained the purpose and scope of that jurisdictional grant on numerous occasions. For example, in *Detroit Edison Co.* (Enrico Fermi Atomic Power Plant, Unit No. 2), ALAB-475, 7 NRC 752, 756-57 (1978), we stated:

[T]he Commission's writ to enforce the antitrust laws does not run to the electric utility industry generally. Neither does it reach

¹⁰ Nothing that we say in this opinion is meant to express any view on the merits of P&W's antitrust claims.

¹¹ Section 105c(5) of the Atomic Energy Act of 1954, 42 U.S.C. 2135c(5).

all actions by utilities that generate electricity with nuclear-powered facilities. Rather, Congress authorized this Commission to condition nuclear power plant licenses on antitrust grounds only where necessary to insure that the activities so licensed would neither create nor maintain situations inconsistent with the antitrust laws. The reason for the grant, as the Commission has explained, was "a basic Congressional concern over access to power produced by nuclear facilities," because the industry was nurtured by public funds and the legislature was anxious that nuclear power "not be permitted to develop into a private monopoly via the [NRC] licensing process." Put another way, the preservation and encouragement of competition in the electric power industry through "fair access to nuclear power" is the principal motivating consideration underlying Section 105c of the Atomic Energy Act [footnotes omitted].

Other NRC decisions in the antitrust area have been an elaboration of that basic theme. Thus, in *Kansas Gas and Electric Co. (Wolf Creek Generating Station, Unit No. 1)*, ALAB-279, 1 NRC 559, 574-75 (1975) (*Wolf Creek I*), we explained how the Commission had devised its pleading requirements to flesh out the statutory standard:

Where an intervenor proposes to raise antitrust matters, the Commission has elucidated its regulations to make clear, first, that his petition "must describe a situation inconsistent with the antitrust laws" [*Louisiana Power and Light Co. (Waterford Steam Electric Generating Station, Unit 3)*, CLI-73-7, 6 AEC 48, 49 (1973) (*Waterford I*)]; second, that "[a] description of a situation inconsistent with the antitrust laws — however well pleaded — accompanied by a mere paraphrase of the statutory language, alleging that the situation would be created or maintained by the activities under the license, would be deficient" (*Waterford II, supra*, 6 AEC at 621 n.2); and, third, that the petition must "identify the specific relief sought . . . and whether, how and the extent to which the request fails to be satisfied by the license conditions proposed by the Attorney General" (*Waterford I, supra*, 6 AEC at 49).

Most critical is the second of the requirements — an explanation of how the activities under the license would create or maintain an anticompetitive situation (*Waterford II, supra*, 6 AEC at 621):

In our view, it is the existence of that tie which is critical to antitrust proceedings under the Atomic Energy Act. If activities relating to a facility have no substantial connection with alleged anticompetitive practices, there is no need for a hearing as to such

practices or proposed forms of relief from them. In short, an intervenor must plead and prove a meaningful nexus between the activities under the nuclear license and the "situations" alleged to be inconsistent with the antitrust laws.

• • •

The hearing issues cannot and should not be divorced from the overriding requirement that there be a reasonable nexus between the alleged anticompetitive practices and the activities under the particular nuclear license. This is a primary and predominant question which must pervade the proceeding [footnote omitted].

Where such a tie has been shown, we have not hesitated to order relief designed to remedy an anticompetitive situation. See *Alabama Power Co.* (Joseph M. Farley Nuclear Plant, Units 1 and 2), ALAB-646, 13 NRC 1027 (1981) (*Farley*), petition for review pending sub. nom., *Alabama Power Co. v. Nuclear Regulatory Commission*, No. 81-7547 (11th Cir., filed June 30, 1981); *Toledo Edison Co.* (Davis-Besse Nuclear Power Station, Units 1, 2 and 3), ALAB-560, 10 NRC 265 (1979) (*Davis-Besse*); *Consumers Power Co.* (Midland Plant, Units 1 and 2), ALAB-452, 6 NRC 892 (1977) (Midland).

B. Analysis of P&W's Petition

The crux of P&W's petition is its claim that FPL exercises monopoly power over the transmission of electric power in southern and eastern Florida, and that the settlement conditions for St. Lucie 2 do not afford small power producers, such as P&W, fair access to FPL's transmission grid. Without fair access to that transmission grid requiring FPL to wheel P&W-generated power to potential P&W customers (access that FPL has refused), P&W claims it will be injured competitively and the congressional purpose to foster small power production through unconventional means will be frustrated.

We think that claim — the use of monopoly power to injure a potential competitor by a refusal to deal — sufficiently pleads the existence of a situation inconsistent with Section 2 of the Sherman Act. 15 U.S.C. 2.¹² The Supreme Court has expressly ruled that a utility company's unjustified

¹² This is not to say that we consider P&W's papers a model pleading. They do not, for example, name the particular antitrust statute alleged to be violated by FPL's conduct. We are entitled to more from experienced counsel and have so cautioned in the past. *Wolf Creek*

(CONTINUED)

refusal to wheel, where its control of transmission facilities precluded a potential competitor from obtaining low cost power, constitutes a violation of the anti-monopoly provisions of the Sherman Act, 15 U.S.C. 1, 2. *Otter Tail Power Co. v. United States*, 410 U.S. 366 (1973), *affirming*, 331 F. Supp. 54 (D. Minn. 1971).¹³ The fact that here P&W's claim is centered on its desire to use FPL's transmission grid to transmit rather than to receive power is of no consequence.¹⁴ In either case, the key is that monopoly power has allegedly been used to restrict potential competition. See generally *Midland*, *supra*, 6 NRC at 912-14, 918-24.

So too, we think that P&W has adequately pleaded the specific relief it seeks, and how the settlement conditions agreed to by the Department of Justice do not afford it that relief. As noted *supra* p. 26 and n. 6, P&W enumerated the specific settlement conditions it found objectionable, and explained its interest in obtaining a "clean" wheeling provision which would afford more extensive access to FPL's transmission grid.

What is lacking in the petition, however, is what the Commission has termed the "overriding requirement", *Waterford II*, *supra*, 6 AEC at 621, of a meaningful tie between the activities under the license (here, operation of St. Lucie 2) and the anticompetitive situation (in this case, FPL's allegedly monopolistic control over the transmission of electric power in southern and eastern Florida).

P&W's nexus argument is twofold. First, P&W argues that because the St. Lucie settlement agreement contains license conditions that take into account (but, according to P&W, do not cure) FPL's transmission monopoly, there exists a tie between operation of St. Lucie 2 and the anticompetitive transmission grid situation. It is P&W's argument that the "statute requires not that you have a nexus with the facility as such, but with the license under which the facility will operate. This license takes into

I, *supra*, 1 NRC at 576. Nevertheless, because the Sherman Act, Section 2, claim can fairly be inferred from the pleadings, and because the point in any event is not dispositive, we are willing to treat the petition as satisfactorily outlining a situation inconsistent with the antitrust laws.

We also reiterate that nothing in this decision is meant to express any opinion on the merits of P&W's antitrust claims. FPL, for example, argues that it had perfectly justifiable business reasons for refusing to wheel power for P&W.

¹³ See also *Lorain Journal Co. v. United States*, 342 U.S. 143, 154 (1951) (newspaper's refusal to accept advertisements from customers who also advertise on local radio station is use of monopoly power to destroy threatened competition in violation of Sherman Act, Section 2); *Klors v. Broadway-Hale Stores*, 359 U.S. 207, 211-13 (1959) (concerted refusal by appliance retailers, manufacturers and distributors to deal with retail dealer violates Sherman Act, Section 1).

¹⁴ P&W does in fact also allude to its need to have power wheeled in to it. See OL Brief, *supra* n.6, at 18.

account FPL's entire transmission grid." App. Tr. 10.¹⁵ Second, P&W argues that it has a constitutional right to intervene in the proceeding because it is a PURPA facility affected by the license conditions. App. Tr. 25, P&W App. Brief at 51-58. We find neither argument persuasive.

The controlling language of Section 105c(5) requires that the anticompetitive situation be linked to "the activities under the license". As we construe that statutory term, and as we have construed it throughout, the licensed activities must play some active role in creating or maintaining the anticompetitive situation. Put another way, the nuclear power plant must be an actor, an influence, on the anticompetitive scene.

Wherever we have found the nexus requirement met, that fundamental linkage has existed. Thus, in each of our cases the focus has been on the claim that the cheaper power of the nuclear plant being licensed would actively support the dominant competitive position of the license applicant. For example, in *Midland*, *supra*, 6 NRC at 1094-95, we had

no difficulty in making the requisite connection on the basis of this record. One reason we have written at length — perhaps prolixly — is precisely to demonstrate that nexus between the existing anticompetitive situation and the introduction of the Midland generating capacity. Without repeating our findings chapter and verse, fair access to efficient, dependable and economical baseload generation is at the heart of the competitive situation before us [footnote omitted].

Similarly in our recent *Farley* decision (*supra*, 13 NRC at 1086), we found

no doubt as to the company's short and long-range objectives in refusing to share in the ownership of Farley; the preservation of its dominant power in the wholesale and retail markets for electricity in central and south Alabama.

See also *Davis-Besse*, *supra*, 10 NRC at 293-94.

This is not to say that a refusal to wheel — the situation of which P&W complains — cannot be an antitrust violation or form the predicate for relief that the NRC is entitled to impose to remedy an anticompetitive situation. (As we have already observed, *supra* p. 30, the P&W petition does adequately outline a Sherman Act, Section 2, violation by FPL.) Indeed, in each antitrust case that has reached us on the merits, we have found that a wheeling provision was justified in order for the potential

¹⁵ See also *Brief of Parsons and Whittemore, Inc. and Resources Recovery (Dade County) Inc. in Support of their Appeal from Denial of their Intervention Petition and Request for Hearing* (filed October 26, 1981) at 18-23 (P&W App. Brief).

competitor to make efficient use of its access to the nuclear plant's power.¹⁶ But the wheeling relief we have ordered has been in the context of remedying an anticompetitive situation that was influenced by the power plant being licensed. We stressed in *Midland, supra*, 6 NRC at 1099, that as to that situation,

no type of license condition — be it a requirement for wheeling, coordination, unit power access, or sale of an interest in the plant itself — is necessarily foreclosed as a possible form of relief. Section 105c imposes no limits in this respect; it gives the Commission “authority . . . to issue a license with such conditions as it deems appropriate” [footnote omitted].

See also *Davis-Besse, supra*, 10 NRC at 291-92; *Farley, supra*, 13 NRC at 1098-99.

Our focus here, for purposes of deciding whether P&W has satisfied the statutory nexus requirement, must therefore be on what way P&W claims operation of St. Lucie 2 will harm it competitively, not whether access to FPL's grid is an appropriate form of relief to remedy a Sherman Act, Section 2, violation. All that P&W offers on this score is the claim that the settlement license conditions for St. Lucie 2 do not cure the anticompetitive situation of FPL's monopolistic hold on the transmission grid for southern and eastern Florida. But that is insufficient. The license conditions do not adversely affect P&W. As P&W concedes, and as is plainly so, the license conditions impose obligations *only* on FPL.¹⁷ P&W is in no worse position with the license conditions than with no license conditions whatever.

Nor is there any way other than the settlement license conditions in which P&W claims operation of St. Lucie 2 will adversely affect its competitive position. There is simply no explanation by P&W of how FPL's bringing on line St. Lucie 2 will act to maintain or entrench FPL's alleged transmission monopoly. In essence, P&W's argument reduces to

¹⁶ See *Midland, supra*, 6 NRC at 1044 (“without access to the company's transmission network, the small utilities cannot coordinate with or buy wholesale power from . . . utilities other than Consumers”); *Farley, supra*, 13 NRC at 1108 (“[i]t is evident that AEC needs access to the applicant's transmission system to make effective use of its share of the output from Farley”). See also *Davis-Besse, supra*, 10 NRC at 294 n.76 (approving of wheeling conditions parallel to those imposed by the Supreme Court in *Otter Tail, supra*).

¹⁷The following exchange for example, took place at oral argument (App. Tr. 9):

[MR.] EILPERIN: It is my understanding that the settlement agreement does not impose any obligations on anyone other than FPL. Is that inaccurate?

MR. KUCIK [P&W]: No, that is accurate.

While P&W's intervention petition claimed that the settlement license conditions restricted its PURPA rights before FERC (see *supra*, p. 26), Section XIII of the conditions belies that claim, for it provides that “[n]othing herein shall be construed to affect the jurisdiction of FERC or any other regulatory agency.” See also 14 NRC at 339. We expressly rule that the settlement license conditions in no way diminish whatever PURPA rights P&W may have.

the proposition that, where an applicant for a nuclear power plant enjoys a monopoly position, this Commission can take the licensing of the plant as the occasion for remedying the anticompetitive situation, despite the fact that the nuclear power plant has no influence on that situation. That position reads out the nexus requirement of Section 105c(5) in its entirety. Whatever may be the merits, as a matter of antitrust policy, of P&W's position that this Commission should exercise such wide-ranging antitrust authority, Congress has not seen fit to extend NRC's antitrust jurisdiction that far.

Lastly, P&W claims that it has a constitutional right to intervene in the proceeding because the proceeding ostensibly affects its interest. P&W relies on three cases, none of which is apposite.¹⁸ The short answer to P&W's argument is that the proceeding does not affect any constitutional interest. Nothing in the proceeding, including the license conditions that are the focus of P&W's concern, imposes any obligation whatever on P&W. Nor, in a practical sense, does denial of intervention impair or impede P&W's ability to protect its interest in obtaining PURPA wheeling rights from FPL. *Cf.* Fed. R. Civ. P. 24(a). Indeed, the settlement license conditions explicitly recognize the Federal Energy Regulatory Commission's power and authority to grant wheeling rights to PURPA facilities. See n.17 *supra*.

Our rejection of P&W's position does not leave it without a forum in which to press its case. It can pursue its antitrust claims before a federal

¹⁸ In *Natural Resources Defense Council, Inc. v. Costle*, 561 F.2d 904, 909 n.27 (1977), the D.C. Circuit reversed a district court order that denied the intervention petition of certain manufacturers who "will almost certainly be affected by regulations promulgated pursuant to the settlement agreement" between the Environmental Protection Agency and an environmental organization relating to a rulemaking timetable for regulating pollutants under the Federal Water Pollution Control Act Amendments of 1972. The court of appeals found that that interest, coupled with their interest in possible further proceedings about modifications in the timetable and exclusion of certain substances from regulation, satisfied the practical impairment of interest standard of Fed. R. Civ. P. 24(a)(2). Even assuming that the practical impairment of interest standard of Rule 24(a)(2) is constitutionally mandated (a dubious proposition at best because it would mean that the pre-1966 version of Rule 24 was constitutionally defective), the multiplicity of interests at stake in *Costle* present a far more compelling case than this, where the settlement license conditions do not trench on how P&W is to conduct its business, and P&W can protect its interest against FPL's allegedly anticompetitive practices in other forums. See *infra*, pp. 20-21.

In *Sea-Land Service, Inc. v. Federal Maritime Commission* 653 F.2d 544 (1981), the D.C. Circuit ruled that Section 15 of the Shipping Act of 1916, 46 U.S.C. 814, requires a new notice and opportunity for third persons to comment on final agency action that expands the authority proposed by parties to a Section 15 shipping agreement. That case, which has due process overtones, is inapposite for a variety of reasons, most notably because the settlement license conditions here do not expand, but rather limit, FPL's NRC-licensed activities. For the same reason, *Arkansas-Best Freight System v. United States*, 399 F. Supp. 157 (W.D. Ark. 1975), *aff'd sub. nom.*, *Bowman Transportation, Inc. v. Arkansas-Best Freight System, Inc.*, 425 U.S. 901 (1976), upon which the *Sea-Land* court relied, is inapposite.

district court; its PURPA and associated claims before the Federal Energy Regulatory Commission; its claims for interconnection before the Florida Public Service Commission; and its contract dispute claims (*supra*, p. 27) before the appointed arbitrator. But Congress has limited our antitrust review jurisdiction to anticompetitive situations influenced by the nuclear power plant being licensed, and, absent an explanation by P&W of that tie, we must deny its petition for intervention.¹⁹

The Licensing Board's denial of Parsons and Whittemore's intervention petition is *affirmed*.

It is so ORDERED.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the Appeal Board

¹⁹ While we do not understand P&W to have filed a federal district lawsuit, other avenues are being pursued. The contract dispute is in arbitration and FERC has before it P&W's claim to PURPA status. Moreover, on December 20, 1981 the Florida Public Service Commission ordered FPL to interconnect its transmission grid with P&W. See Florida Public Service Commission, Order Requiring Interconnection, Order No. 10481, Docket No. 810249-EU(MC). Interconnection was accomplished January 9, 1982, but the order is still subject to a pending appeal. See *Amicus Curiae Brief and Proposed License Conditions Submitted by Parsons & Whittemore, Inc. and Resources Recovery (Dade County), Inc.* (filed January 13, 1982) at p. 4 n.5.

In addition, the Licensing Board has found that, insofar as Florida Cities' claims are concerned, the operation of St. Lucie 2 would create or maintain a situation inconsistent with the antitrust laws. LBP-81-58, 14 NRC1167 (December 11, 1981). As noted earlier, *supra* p. 28, P&W has been granted *amicus* status before the Licensing Board to present legal arguments concerning the appropriateness of granting relief to PURPA facilities. Thus, it may be that even our own adjudicatory forum offers P&W the possibility of some remedy. *But see* p. 33, *supra*. We, of course, express no opinion on the correctness of this recent Licensing Board decision, or on the appropriate scope of relief should that decision stand.

28, 1980, the NRC Staff published a Notice of Proposed Issuance of Amendment to Facility Operating License (45 FR 35948). That Notice provided that requests for hearing could be filed by June 27, 1980.

Some seven months later on January 19, 1981, under the letterhead of the New York Public Interest Research Group, that Group; The Citizens' Institute for a Positive Energy Policy; Greater New York Council on Energy; Westchester People's Action Coalition; Friends of the Earth, Atlantic Region; and Warren Liebold, Mina Hamilton, and Marvin Resnikoff (of the Sierra Club) filed a request for hearing. The request enumerated five specific areas of concern but did not indicate whether any of the petitioners had standing. The request stated:

"[e]ven though we monitor the operations at Indian Point as best as we can, we failed to spot [the notice of proposed issuance]"

Staff responded in opposition to the request. Applicant indicated in a letter of February 27, 1981, that it would respond in accord with the time limits set forth in 10 CFR §2.714. Apparently Applicant was not served and was alerted to the request by the Staff's response. Petitioners, on March 4, 1981, indicated their desire to reply to both Applicant and Staff ten days following Applicant's response.

The matter remained in this posture until November 6, 1981, when the Staff filed a Status Report indicating that it was ready to issue the requested amendment but for the pendency of the hearing request. This Board was then reconstituted. After review of the matter, the Board issued an Order on November 13, 1981, which, noting the absence of a response from Applicant, afforded Petitioners an opportunity to reply to the Staff's response and Applicant and Staff an opportunity to respond to any such reply. Filings have been received pursuant to this Order.

Before addressing the merits of the Petitioners' request, the Board will respond to a request for Applicant contained in a letter to the Board of November 13, 1981. That letter states that ". . . it would be a monstrous perversion of administrative procedure and the Commission's rules if [a hearing] request were to receive any consideration, some seventeen months . . ." after the deadline for such requests. The letter emphatically points out that Applicant has never been served with such a request, and alleges that Applicant will be prejudiced if the amendment is not issued forthwith.

Applicant's assertion that there is a basis for ignoring the request must ultimately rest on the fact that Applicant was never served. But for the fact that Applicant had actual knowledge of the existence of the request, its argument might have some merit. However, despite its knowledge that a request was outstanding, Applicant chose to do nothing until the filing of the Staff's Status Report. Had Applicant acted on its knowledge, obtained and responded to the request, this matter undoubtedly could have been

resolved by late spring of last year. Its inaction could only lead to the inference that it did not object to the hearing request.

In these circumstances, it is particularly inappropriate for Applicant to urge that the request be dismissed without consideration. Clearly any delay in considering the request was occasioned by Applicant's failure to respond. It comes with ill grace for Applicant, having created the delay, to now argue that this delay requires dismissal of the request without consideration. We therefore will consider the request on its merits.

Both Applicant and Staff argue that Petitioners' December 1 filing is sufficiently different from this earlier request as to constitute a new request. If this argument is accepted, the request is tardy by some 17 months rather than seven months. We do not address this argument because we consider the request inexcusably tardy when considered 'only six months late. Similarly we do not consider Petitioners' compliance with §2.714 with regard to standing and the identification of aspects of the proceeding in which they are interested. We assume without deciding that Petitioners have satisfied these requirements, and proceed to a consideration of the factors specified in §2.714 under which tardy requests are to be judged.

Good Cause for Failure to File on Time

In their original request, Petitioners indicated that they had simply failed to spot the notice indicating that the license amendment application had been filed. In their December 1 filing, they state that until January 8, 1981, they had anticipated that the issues encompassed by the amendment would be considered in another proceeding, currently underway, with regard to the Indian Point Station.

Applicant correctly points out that these two justifications are inherently inconsistent. The December excuse — that the Petitioners were looking to another proceeding to satisfy their concerns — implies that Petitioners were aware of the pendency of the license amendment application. In their earlier request, Petitioners assert that they were not aware of the request. Consequently, the December justification must be discounted.

But even if this justification is accepted, it cannot excuse Petitioners' delay. In order to protect their rights, it was incumbent upon Petitioners to file their request in this proceeding on a timely basis. The request could have incorporated the condition that it should be deemed withdrawn if their concerns were taken up elsewhere. Just as a petitioner may not rely upon its interests being represented by another and then justify an untimely petition to intervene on the other's withdrawal from the proceeding (*Gulf States Utilities Company* [River Bend Station, Units 1 and 2],

ALAB-444, 6 NRC 760, 796 [1977]; *cf. Duke Power Company* [Cherokee Nuclear Station, Units 1, 2 and 3], ALAB-440, 6 NRC 642, 645 [1977], a petitioner may not rely on the pendency of another proceeding to protect its interests and then justify its late petition on that reliance when the other proceeding fails to encompass petitioner's interests. *Cf. Public Service Company of Indiana* (Marble Hill Nuclear Generating Plant, Units 1 and 2), LBP-76-25, 3 NRC 847, 854-5 (1976).

Nor does reliance on the other proceeding in this situation appear justified. As Staff points out, the scope of this other proceeding has not changed significantly since May 30, 1980, when it was delineated by the Commission in an unpublished order. The questions posed by the Commission in that order do not arguably include considerations incident to the expansion of the spent fuel pool's capacity.

Finally, we note that Petitioners' original justification, failure to spot the notice, does not furnish justification for their untimely request. Just as an ignorance of the Commission's requirements with regard to requests for hearing and petitions to intervene does not justify untimely filings (*Tennessee Valley Authority* [Browns Ferry, Units 1 and 2], ALAB-341, 4 NRC 95 [1976]; *New England Power & Light Company* [NEP, Units 1 and 2], LBP-78-18, 7 NRC 932 [1978]), ignorance of the publication of the *Federal Register* notice does not constitute good cause for this belated request. The Federal Register Act provides that "[a] notice of hearing or of opportunity to be heard, required or authorized to be given by an Act of Congress . . . shall be deemed to have been given to all persons residing within the States of the Union . . . when the notice is published in the Federal Register . . ." (44 USCA §1508) Clearly, failure to spot the *Federal Register* notice in question does not constitute good cause for Petitioners' untimely request.

In sum, we hold that Petitioners' December justification for its belated request is, first, implausible; second, legally insufficient; and third, even if legally sufficient, not reasonable under the circumstances. We hold that its original justification is legally insufficient. Petitioners have totally failed to show good cause for this belated request. Nonetheless, the remaining four factors under §2.714 must be considered. We proceed with that consideration.

The Remaining Four Factors

The first of the remaining four factors is the availability of other means whereby Petitioners may protect their interests. Petitioners point to the ongoing proceeding and state that this will not afford them protection. We agree. Beyond that, as Applicant and Staff point out, there are the

provisions in the Commission's rules which permit members of the public to seek the initiation of rulemaking and adjudicatory proceedings. While we agree that these provisions are available to Petitioners, we do not think they are as efficacious as a prior hearing. Therefore we weigh this factor slightly in Petitioners' favor.

The second of the remaining factors is the extent to which Petitioners may be expected to assist in the development of a sound record. Petitioners state that they intend to offer expert testimony on the issues identified in their request, and that this testimony will differ substantially with Applicant's and Staff's analyses. Without a further particularization, this factor must be weighed against Petitioners. An unparticularized statement that expert testimony will be offered is insufficient, in these circumstances, to assist Petitioners.

The third of the remaining four factors, the extent to which Petitioners' interest will be represented by existing parties, weighs in Petitioners' favor only to the extent that, if Petitioners' request is denied, there will be no proceeding and hence no parties. However, as the staff points out, it has a duty to see to it that the public interest in the enforcement of the Atomic Energy Act's requirements is met. In the circumstance of an unjustifiably late request which does not indicate what benefits to the public will result from its allowance, we believe it appropriate to assume that the Petitioners' interest will be adequately represented by the Staff. Consequently we do not weigh this factor in Petitioners' favor.

The last of the remaining factors, whether Petitioners' participation would broaden the issues or delay the proceeding, weighs against Petitioners. Clearly their participation will do both. Absent some showing that a public benefit will accrue from their participation, it must be assumed that starting a proceeding at this late date will have the effects of, at a minimum, inconveniencing the Applicant and diverting Commission resources from other tasks. Thus this factor weighs against Petitioners.

Conclusion

We have found a total absence of good cause for Petitioners' belated request for a hearing. An examination of the remaining four factors which §2.714 directs us to consider reveals that only one weighs in Petitioners' favor, and then only slightly. No other request for a hearing having been received, we must conclude that no proceeding should be initiated. Therefore, it is this 4th day of January, 1982,

ORDERED,

The Petitioners' request for hearing of January 19, 1981, as supplemented by their Response of December 1, 1981, is hereby *denied*.

Petitioners may appeal this ruling to the Atomic Safety and Licensing Appeal Board by filing of a notice of appeal and supporting brief within ten (10) days of the service of this Memorandum and Order. Any other party may file a brief in support of or opposition to the appeal within ten (10) days of the service of Petitioners' notice and brief.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Glenn O. Bright
ADMINISTRATIVE JUDGE**

**Richard F. Cole
ADMINISTRATIVE JUDGE**

**John H Frye, III, Chairman
ADMINISTRATIVE JUDGE**

**Dated at Bethesda, Maryland,
this 4th day of January, 1982.**

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Peter B. Bloch, Chairman
Dr. Jerry R. Kline
Mr. Frederick J. Shon**

In the Matter of

**Docket Nos. 50-440-OL
50-441-OL**

**CLEVELAND ELECTRIC
ILLUMINATING COMPANY, *et al.*
(Perry Nuclear Power Plant,
Units 1 & 2)**

January 6, 1982

The Board decides that in the absence of specific contrary directions from the Commission, a contention should not be dismissed from a proceeding merely because a Commission rulemaking proceeding is pending. Consequently, a contention concerning a method to mitigate an anticipated transient without scram (ATWS) should not be dismissed because of a pending rulemaking on that general subject. This type of contention is not considered to be subject to a principle assertedly established with respect to radioactive waste disposal contentions, that such issues are generic and should not be considered in individual proceedings.

RULES OF PRACTICE: CONTENTIONS

Contentions need not be dismissed merely because there is a pending rulemaking on the same subject unless the Commission has specifically directed that they be dismissed. No such direction has been issued concerning contentions regarding ATWS.

MEMORANDUM AND ORDER
(Concerning Motion to Dismiss ATWS Contention)

Applicant seeks to dismiss Issue #6, the anticipated transient without scram (ATWS) contention. (Motion of December 9, 1981.) That issue states:

Applicant should install an automated standby liquid control system to mitigate the consequences of an anticipated transient without scram.

(An anticipated transient without scram occurs in a power reactor when a foreseeable problem is so severe that control rods should be inserted in the reactor core to slow the reaction but insertion fails to occur. An automated standby liquid control system automatically puts a reactivity "poison", such as boron, into the reactor coolant in order to slow the reaction.)

Applicant claims that the ATWS issue should be dismissed because of proposed rulemaking on ATWS issued on November 24, 1981. It argues that Boards should not accept contentions that are the subject of general rulemaking by the Commission. *Potomac Electric Power Company (Douglas Point Nuclear Generating Station, Units 1 and 2)*, ALAB-218, 8 AEC 79, 85 (1974). However, the regulatory staff of the Commission (staff) disagrees with this interpretation of *Douglas Point* and rejects applicant's arguments for dismissal.

I. APPLICANT'S ARGUMENTS

Applicant argues that the *Douglas Point* principle

is especially germane here, where consideration of the same issue in this proceeding that is being considered in a general rulemaking proceeding would be administratively inefficient and counter-productive. No purpose would be served in having this Licensing Board determine whether or not Applicants should install an automated standby liquid control system when that very question will be determined generically by the Commission in a rulemaking proceeding.

Applicant's Brief of August 11, 1981.

Dismissal is sought by Applicant for two additional reasons. First, that the "supplementary information" accompanying the proposed rule has findings supporting the continued operation of reactors during the pendency of the rulemaking. Applicant argues that if plants may continue to operate during the pendency of rulemaking that it necessarily follows that a plant that will not commercially operate for two and a half years does not require design modifications prior to the completion of the rulemaking. Applicant's motion at 3-4.

Second, applicant argues that two of the proposed ATWS rules deal explicitly with automated standby liquid control systems (SLCS) and that it would be unnecessary and counterproductive to litigate these same issues in this case. Applicant considers it particularly unproductive because of the possibility that the Board would reach a different conclusion from that reached in the parallel rulemaking proceeding.

II. STAFF'S ARGUMENTS

Staff distinguishes the *Douglas Point* case on the ground that it dealt with uranium fuel cycle issues which were beyond the reach of Commission regulations, particularly Appendix D to Part 50. *Vermont Yankee Nuclear Power Corporation (Vermont Yankee Nuclear Power Station)* ALAB-56, 4 AEC 930 (1972); *Long Island Lighting Company (Shoreham Nuclear Power Station)* ALAB-99, 6 AEC 53 (1973). By contrast, staff finds that 10 CFR Part 50, Appendix A and the Standard Review Plan (NUREG-0800, §15.8) set forth several ATWS-related general design criteria (Criteria 10, 15, 26, 27 and 29) and that the mitigation or control of ATWS events currently falls within the ambit of the regulations.

Staff also indicates that the supplementary information published with the proposed ATWS rule does not provide a reason for suspending the application of existing Commission rules, including the applicable general design criteria. Furthermore, staff does not consider the language in the supplementary information to constitute an explicit direction to the Board not to address ATWS issues in ongoing proceedings.

III. CONCLUSIONS

We are convinced that there are even more significant differences between this proceeding and *Douglas Point* than have been argued to us by staff. Consequently, the motion to dismiss shall be denied.

First, we are persuaded that the Commission's existing regulations, contained in Appendix A to Part 50, survive the issuance of a proposed rule. Nothing in the supplementary information indicates that the existing regulations relating to ATWS are to be suspended. (Nor is there any reason to think that the issuance of a proposed rule should freeze current thinking about the interpretation of judgmental standards contained in the existing rules.)

Second, whether or not Perry should have an automated standby liquid control system is far more specific to Perry than nuclear waste disposal ever was to any particular plant. Perry is one of the first General Electric BWR/6 reactors with a Mark III containment to apply for a license and an appropriate decision about an SLCS for Perry requires detailed knowledge of its characteristics. Hence, specific knowledge of this particular plant is required both for an adjudicatory determination and for issuance

of a reasoned rule affecting Perry. In this sense, this issue is by nature specific.

Although the requirement of an SLCS can be treated by rulemaking, our effort to assemble and analyze facts in an adjudicatory setting will be helpful to the Commission whether the ultimate decision is made in an adjudicatory context or through rulemaking. Unlike fuel disposal issues, which are largely industry-wide and dependent on overall policies, the SLCS issue has many aspects specific to Perry and different from SLCS issues that might be raised with respect to different power reactors.

Third, the Commission has suggested a variety of approaches in its proposed rules. Under the first proposed rule, if enacted, an SLCS would be required unless the Board determined that "an operator would have adequate information and would reasonably be expected within the time available to take the proper corrective action." Proposed §50.60(b)(3), 46 Fed. Reg. at 57525. Hence, even if this rule were adopted, Board efforts to resolve this issue are likely to contribute to reaching an appropriate result.

Fourth, the Commission has not explicitly barred ATWS issues from proceedings, and we are reluctant to infer that they were intended to be barred. The supplementary material issued with the proposed rule does state that "there is reasonable assurance of safety for *continued operation* until implementation of a rule is complete." [Emphasis added.] 46 Fed. Reg. at 57523. However, the Commission did not advise Boards, as it did in the solid waste disposal rulemaking, to discontinue their consideration of ATWS issues during the pendency of the rulemaking. Therefore, we continue to be controlled by the procedural rules which require us to adjudicate contentions that have been found to be admissible in the proceeding.

The consideration of ATWS issues is particularly important because the Commission has determined that "reductions must be made in the frequency, severity, or both the frequency and severity of ATWS accidents." 46 Fed. Reg. at 57522. Hence, this is the kind of serious safety issue which is at the core of the Board's responsibilities in deciding whether to license Perry.

ORDER

For all the foregoing reasons and based upon consideration of the entire record in this matter, it is this 6th day of January, 1982

ORDERED

Cleveland Electric Illuminating Co., *et al.*'s motion to dismiss Issue #6, relating to the use of an automated standby liquid control system to mitigate an anticipated transient without scram (ATWS), is denied.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

**Dr. Jerry R. Kline
ADMINISTRATIVE JUDGE**

**Frederick J. Shon
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Peter B. Bloch, Chairman
Jerry R. Kline
Hugh C. Paxton

In the Matter of

Docket Nos. 50-266-OLA
50-301-OLA

**WISCONSIN ELECTRIC POWER
COMPANY**

**(Point Beach Nuclear Plant,
Units 1 and 2)**

January 7, 1982

The ASLB issues an order which supplements its earlier order of December 21, 1981 (LBP-81-62) 14 NRC 1747 (1981), by adopting a protective order covering the release to the intervenor of allegedly proprietary material that it previously found should be released.

The Board denies requests for discovery and an evidentiary hearing concerning allegations that the intervenor cannot be trusted to receive the information under protective order. It balances the nature of the allegations against the nature of the allegedly proprietary material and concludes that the discovery and hearing are not warranted.

Other issues raised in a motion for reconsideration filed by Westinghouse Electric Corporation, appearing specially in support of the proprietary nature of its sleeving report, are left for decision on a subsequent occasion. The Board also schedules an evidentiary hearing concerning the allegations that material in the Westinghouse sleeving report is proprietary. It establishes procedures for the fair and expeditious conduct of that hearing.

ADJUDICATORY BOARDS: DELEGATED AUTHORITY

Pursuant to 10 CFR §2.718, Boards may issue a wide variety of procedural orders that are neither expressly authorized nor prohibited by the rules. They may permit intervenors to contend that allegedly proprietary submissions should be released to the public. They may also authorize discovery or an evidentiary hearing that are not relevant to the contentions but are relevant to an important pending procedural issue, such as the trustworthiness of a party to receive allegedly proprietary material.

However, discovery and hearings not related to contentions are of limited availability. They may be granted, on motion, if it can be shown that the procedure sought would serve a sufficiently important purpose to justify the associated delay and cost.

INTERVENTION: STANDING TO LITIGATE CONFIDENTIALITY ISSUES

Intervenors who have been admitted as parties may litigate issues concerning the alleged proprietary nature of submitted documents and may receive, under protective order, relevant information that has been withheld from the public but is relevant to determining the proprietary nature of submissions.

LICENSING BOARD(S): AUTHORITY TO REGULATE PROCEEDINGS

See "Adjudicatory Boards: Delegated Authority".

RULES OF PRACTICE: DISCOVERY (TRUSTWORTHINESS TO RECEIVE DOCUMENTS UNDER PROTECTIVE ORDER)

Discovery that is not related to contentions may be authorized, on motion, under the general authority of the Board; however, it is not authorized explicitly by the rules. The moving party must carry the burden of demonstrating that the information sought is sufficiently important to justify the delay in the proceeding. On balance, discovery may not be had concerning a single instance of the alleged untrustworthiness of an intervenor to receive proprietary documents when the allegation is of limited seriousness and the information which would be released pursuant to protective order has very limited competitive value.

**RULES OF PRACTICE: EVIDENTIARY HEARING
(TRUSTWORTHINESS TO RECEIVE
DOCUMENTS UNDER PROTECTIVE
ORDER)**

A party is not entitled to an evidentiary hearing on a question of the alleged untrustworthiness of an intervenor unless the issues to be tried are sufficiently serious, in light of the material which may be released to the intervenor under protective order, to justify the delay and expense of such a hearing.

**RULES OF PRACTICE: SPECIAL PROCEDURE FOR
CONFIDENTIAL TRIAL PLAN**

A party may be permitted to file a trial plan with the Board, without showing specific aspects of it to another party, if the secrecy is shown to be necessary to effective litigation. However, the trial plan will be released to the other party after it is used. Similarly, cross-examination plans may be required to be filed with the Board for subsequent release to parties.

RULES OF PRACTICE: PROTECTIVE ORDER

The Board considered a form of protective order suggested to it by an interested participant and modified and issued that order, attaching it as an appendix.

RULES OF PRACTICE: PROPRIETARY DATA

Under special circumstances, the Board may adopt a protective order governing the release to a party of information contained in an allegedly proprietary affidavit filed in support of the proprietary nature of another document.

**SUPPLEMENTARY ORDER
(Concerning Issuance of a Protective Order)**

Our order of December 21, 1981, LBP-81-62, 14 NRC 1747, determined that Wisconsin's Environmental Decade (Decade) should have access to an unexpurgated version of the allegedly proprietary November 13, 1981 affidavit (Wiesemann affidavit) filed by Westinghouse Electric Corporation

(Westinghouse) in support of its claim that portions of another document, the Westinghouse Sleeving Report, are proprietary and should not be released to the public. The Board permitted Westinghouse Electric Corporation (Westinghouse) to propose a protective agreement which could be executed by Decade and implemented as a protective order.

Westinghouse's response exceeded our expectations. In addition to a proposed protective order it filed a motion for reconsideration of our December 21 order, a request for admissions and a request for an evidentiary hearing—all in support of its position that the Wiesemann affidavit not be released to Decade, even under protective order.

The purpose of this memorandum is to consider the issuance of a protective order and to decide only those issues necessary to that consideration. We will not address portions of the motion for reconsideration that are irrelevant to this concern. Those portions will be addressed subsequently, after other parties have had an opportunity to respond.

I. SUMMARY OF CONCLUSIONS

We have concluded that the Wiesemann affidavit, with the sole deletion of the amount of money spent by Westinghouse to develop its sleeving process, should be released to Decade under protective order. That order, which is Attachment A to this decision, is patterned on the protective agreement submitted by Westinghouse, with some important deletions and amendments made by the Board.

After considering the nature of the proprietary information which will be released by order to Decade and the nature of the previous improprieties which Westinghouse alleges to have been committed by a Decade representative, we have concluded that it is appropriate to issue the protective order without discovery and without an evidentiary hearing.

In our December 21 order, we discussed each section of the affidavit which will be released under protective order. (We failed to discuss the amount of Westinghouse's investment, which we had previously indicated that we did consider to be proprietary.) We found that there would be very little harm to Westinghouse were the information to be released to the general public but that, on balance, some of the information should not be released because its value to Westinghouse exceeded its value to the public. An implication of this balancing act is that there is little risk in releasing the marginally proprietary information to Decade, which is a party to this proceeding and that the value to the Board of Decade's participation on this issue is enough to require the issuance of a protective order.

We note that Westinghouse continues to assert that Decade is not entitled to discovery of this affidavit because it is not relevant to its contentions in this proceeding. However, Westinghouse has not addressed

the reasoning by which we concluded that Decade could present its position in support of the public release of information in the Sleeving Report and that it could obtain discovery related to that release.

II. THE NATURE OF THE ALLEGATIONS

In its December 31, 1981 filings, Westinghouse still has not introduced any evidence concerning its allegations that Decade cannot be trusted with proprietary information. However, it has filed a detailed set of requests for admissions. Since those requests relate largely to publicly available documents, Westinghouse has now added some specificity to its concerns.

We cannot, of course, accept Westinghouse's "Requests for Admissions of Fact" as establishing anything. Particularly since these requests call into question the trustworthiness of an individual, it would be highly improper for us to reach any unfavorable conclusions about that individual before he has had an opportunity to answer. Therefore, we have not in any way changed our opinion of Decade's representatives, who have been trustworthy and forthright in their dealings with this Board.

However, Westinghouse has requested that it be permitted to pursue its concerns through use of our discovery procedures. Solely for the purpose of considering that request, we shall adopt the hypothetical assumption that the Westinghouse allegations are true. The remainder of this discussion proceeds on that hypothetical assumption.

If we accept the Westinghouse allegations as true, then Decade's representatives performed the following acts: On September 1, 1981 they filed a "NOTICE OF MOTION AND MOTION FOR STAY OF ENFORCEMENT OF AGENCY ORDER" in the Manitowoc County Circuit Court of the State of Wisconsin. Attached to that motion was a three page Affidavit of Peter Anderson, a Decade representative. The Anderson affidavit was captioned "Trade Secret Notice" and stated that the pleading contained information considered by the Public Service Commission of Wisconsin to be a trade secret and to be covered by a protective order issued by that Commission. However, neither the cover of the Notice and Motion nor pages 2 and 3 of the Anderson affidavit bore any indications of confidentiality. In addition, the Notice and Motion indicates that it was sent to "Robert Halstad", who apparently has not been authorized to receive and examine the trade secrets in the document.

Westinghouse describes its Request for Admissions as its first discovery request, suggesting that there would be follow-up requests as well.

As Westinghouse points out, 10 CFR §2.740 *et seq.* neither prohibits nor allows discovery by a person not a party to a proceeding. We also agree with Westinghouse that these procedures ought to be available to it, as a person (not a party) making a special appearance, if discovery would

advance the purposes of the proceeding by permitting it to seek relevant information. Indeed, this principle of appropriate procedural flexibility is similar to the one we utilized when we permitted Decade to participate in the trade secrets controversy even though the regulations neither prohibit nor authorize their participation. (We have permitted Decade to participate because it raised—and has not waived—the trade secrets issue properly under criteria applied in *Kansas Gas and Electric Company, et al., (Wolf Creek Nuclear Generating Station, Unit No. 1)* ALAB-327, 3 NRC 408 (1976) and because its participation on this issue would be helpful to the Board.)

We also approve of the method by which Westinghouse seeks to employ discovery. It was correct for it to file a motion seeking authorization since the rules do not explicitly authorize them to utilize the discovery process.

The authorization for use of the discovery process states, in 10 CFR § 2.740(b)(1):

Parties may obtain discovery regarding any matter, not privileged, which is relevant to the subject matter involved in the proceeding, whether it relates to the claim or defense of the party seeking discovery or to the claim or defense of any other party [D]iscovery shall . . . relate only to those matters in controversy which have been identified by the Commission or the presiding officer in the prehearing order entered at the conclusion of that prehearing conference.

Also relevant to our determination is our general power and duty to conduct a fair and impartial hearing, as set forth in 10 CFR §2.718.

The regulation authorizing discovery is limited to admitted contentions and does not extend to trade secret matters. However, our general powers would permit us, in order to conduct a fair and impartial proceeding, to order appropriate discovery that is irrelevant to the merits of contentions in a proceeding. Depending on the circumstances, it could be appropriate to order discovery related to the trustworthiness of individuals who are seeking to obtain allegedly proprietary information. 10 CFR §2.718.

However, the more remote from the merits and the more specialized a discovery request may be, the heavier the burden a party must carry in order to persuade the Board that the delay and cost of discovery are necessary and ought to be authorized. Discovery on peripheral issues potentially can tie a proceeding in knots, and it is the duty of this Board to conduct proceedings which are both fair and efficient.

We also do not preclude the possibility that there are issues of such importance that they must be pursued even if they will tie a proceeding up in knots. However, Westinghouse has failed to carry its burden of demonstrating that discovery is appropriate in this instance. The issue on which

Westinghouse seeks discovery is not so important that its request should be granted.

The only allegations Westinghouse has made are: (1) that Decade included a trade secret warning in a filing that it made in a state court but that the warning was inadequate because it was not marked on the cover of the filed documents and on each affected page, and (2) that Decade sent the protected document to an unauthorized individual. These allegations amount to a charge of a single instance of carelessness; and there is no indication that this was part of a pattern of behavior or that the single instance of carelessness resulted in serious loss to Westinghouse. Nor has Westinghouse indicated that it felt sufficiently aggrieved to pursue this instance of alleged breach as a separate matter before any court or agency, including the court in which the filing was made and the agency which issued the protective order that allegedly was violated.

We also note that Westinghouse's allegations against Decade were filed late. On November 30, prior to issuance of our December 21, 1981 order, the chairman of the licensing board telephoned Mr. Francis X. Davis, counsel for Westinghouse. At that time, the chairman requested proof of the charges being made against Decade. Mr. Davis stated he had no proof and that he could not give us a deadline by which he could file such proof. LBP-81-62, 14 NRC 1747, 1760 (1981). Therefore, we concluded that Westinghouse was not interested in proving its charges against Decade and we issued an order on that assumption. Once that order is issued, Westinghouse must show that there has been a change in circumstances to be permitted to alter its earlier answer. Otherwise, it must live with its representations to the Board in this proceeding.

Given the marginal value to Westinghouse of the information in the Wiesemann affidavit to which we decided to accord trade secret status and to which Decade would gain access, it would be improper of us to permit this matter to delay this proceeding any further. Even were Decade to admit all of the facts currently alleged by Westinghouse we would have no reason to deny it access to the particular facts which would be released to it under our protective order. We do not consider it to be at all reasonable for us to permit discovery or to conduct an evidentiary hearing as a precondition to the release of information of such marginal value to a party.

We also are troubled by the timing of Westinghouse's concerns. We issued a protective order in this proceeding on October 9, pursuant to which the Westinghouse sleeving report was delivered to Decade. That report contains at least some information which is entitled to trade secret status. That information is represented to be of very great value to Westinghouse. At the time we issued the order, Wisconsin Electric Company, acting as custodian of the sleeving report and as a representative of

proprietary interests of Westinghouse, presumably with the knowledge and consent of Westinghouse, had no objection to the granting of the protective order, which it had drafted and submitted for our approval. Furthermore, in the middle of October, Decade was given the San Onofre Slewing Report, also a valuable Westinghouse document, under the same protective order. Then, at the October 29 and 30 hearing, Decade representatives were invited to participate in *in camera* sessions where proprietary information was discussed; and there was still no objection to this invitation (which Decade, however, declined).

Now, at this time, after its valuable secrets are already in Decade's hands, Westinghouse raises a question concerning a public court filing alleged to have occurred on September 1, 1981. Yet, we have no indication of the reason for this delay, during which Westinghouse and its client have obtained and utilized a valuable license amendment which might not have been issued in a timely fashion unless a mechanism could have been found to place the trade secrets in the intervenor's hands in a timely fashion.

III. SCHEDULING MATTERS

It is apparent that this issue of confidentiality of documents is sufficiently complex to require an evidentiary hearing, which we are scheduling in Milwaukee, Wisconsin at 9 am on February 16. It should take no longer than one day.

We foresee the possibility of conducting *in camera* sessions in the course of the Milwaukee hearing. This could arise if Westinghouse seeks to introduce testimony which it claims to be confidential. However, we will conduct such *in camera* proceedings only with respect to prefiled, proprietary testimony or to testimony which is proprietary but was not prefiled because the need for the testimony was not reasonably foreseeable.

It is also possible that material to be considered *in camera* could be of such importance that Westinghouse might wish once again to raise questions concerning Decade's trustworthiness. If Westinghouse has such a concern, it may file, within seven days of the issuance of this Order, a brief in which it discusses its evidence concerning untrustworthiness. It must also describe with care the type of information it does not want released and the reason why the information is of such value that we must pursue the trustworthiness issue as a precondition to permitting one or more of Decade's representatives to participate in some or all of the planned *in camera* sessions. Attached to the brief must be affidavits supporting the allegations.

We will not permit fishing expeditions into integrity without previous proof. Westinghouse must, of course, fairly notify Decade of its charges. However, for good cause shown therein, Westinghouse may file detailed

factual allegations against Decade without serving a copy on Decade. (Decade will, of course, receive this filing after Westinghouse rests its case.) Should Westinghouse pursue this suggested avenue of procedure, it also should request an expedited discovery schedule which will fulfill its needs prior to February 16, when this threshold issue could be set for first attention.

One week prior to the February 16 hearing, parties shall prefile, in affidavit form, all testimony and evidence they wish to introduce, including detailed statements of the qualifications of witnesses. Depending on the length of prefiled testimony, the Board may consider the filings to be a partial or complete substitute for oral presentation of the testimony.

In addition, parties shall file with the Board, no later than the evening before the hearing (for release to other parties only at the conclusion of the related cross-examination), their plans for cross-examination. These should be sufficiently detailed to permit the Board to anticipate the subjects that will be covered in cross-examination and the amount of time likely to be necessary for each subject. Parties shall be limited to the areas of cross-examination contained in their plans unless they show cause why the scope should be expanded.

IV. INTERLOCUTORY NATURE OF THIS ORDER

Westinghouse has requested an opportunity to appeal this order prior to confidential information being turned over to Decade. However, our issuance of a protective order is interlocutory and authorization of an interlocutory appeal would adversely affect the efficient conduct of this proceeding. Hence, we do not consider this decision appealable.

However, we do recognize Westinghouse's right to seek to protect its proprietary interests in the Wiesemann affidavit. This it may seek to accomplish either by requesting a stay from the Atomic Safety and Licensing Appeal Board or by seeking discretionary review. Consequently, we shall order Westinghouse to deliver to Decade a copy of the Wiesemann affidavit, with only the dollar expenditures on sleeving deleted. However, the obligation will not commence until after seven days from the issuance of this order. Thereafter, providing that Decade first serves an executed protective agreement on Westinghouse or its representatives, Westinghouse shall promptly deliver the just-described version of the Wiesemann affidavit to Decade.

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is this 7th day of January, 1982.

ORDERED

(1) Westinghouse Electric Corporation shall deliver to Wisconsin's Environmental Decade a copy of the November 13, 1981, affidavit of Mr. Robert Wiesemann, from which it may delete only the dollar amount invested by Westinghouse in the development of its process for sleeving steam generator tubes.

(2) The obligation in paragraph (1) shall commence only after seven days from the issuance of this order and after Decade has served Westinghouse with an executed copy of the protective agreement attached to this Order.

(3) Once Decade has served on Westinghouse an executed copy of the protective agreement it shall be effectuated as a protective order.

(4) There shall be an evidentiary hearing in Milwaukee, Wisconsin at 9 am on February 16, subject to special procedural rules set forth in the memorandum accompanying this order.

(5) This is an interlocutory order and is not subject to appeal.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

ATTACHMENT A

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of

Docket Nos. 50-266-OLA
50-301-OLA

**WISCONSIN ELECTRIC POWER
COMPANY**

(Point Beach Nuclear Plant,
Units 1 and 2)

PROTECTIVE AGREEMENT

In consideration of the disclosure by Westinghouse Electric Corporation ("Westinghouse") to Wisconsin's Environmental Decade, Inc. ("Decade") of Westinghouse proprietary information contained in the "Supplement to Affidavit of Robert A. Wiesemann" dated November 13, 1981, Decade accepts and receives such proprietary information in confidence and trust subject to the following terms and conditions:

1. Decade shall not scrutinize or use the Westinghouse proprietary information for any purpose except in this Atomic Safety and Licensing Board proceeding involving repair of steam generator tubes at the Point Beach Nuclear Power Plant, Units 1 and 2 or in administrative or judicial appeals therefrom. Such examination will be conducted on a non-public confidential basis. Except with the prior written consent of Westinghouse, any proprietary information disclosed pursuant to this Protective Agreement shall only be disclosed to the following persons:

- (a) not more than two legal counsel for Decade whose appearances have been entered of record in this proceeding (the names of such counsel to be provided to Westinghouse at or prior to the time of disclosure);
- (b) one representative of Decade, provided that such representative shall have first executed an acknowledgment to be personally bound by the terms of this Protective Agreement to be in the form set forth at the end hereof.

If Decade determines that it needs to disclose the Westinghouse proprietary information to any other person it shall give Westinghouse seven (7) business days advance written notice. If Westinghouse notifies Decade that it objects to disclosure of the proprietary information to such person, Decade will not make the disclosure but may bring the matter to the Board for resolution.

2. In the event that a participant in this proceeding is directed by the NRC or a court to reproduce or disclose any information in any manner other than as set forth herein, said participant shall first advise Westinghouse in writing of such direction, and shall provide full details with respect thereto.

3. All Westinghouse proprietary information shall be safeguarded by each person and entity subject to this Protective Agreement and held as secret and confidential.

4. Any person to whom disclosure is authorized under this Protective Agreement shall not, during the next two years, represent or seek to represent a company which competes with or seeks to compete with Westinghouse in the manufacture or repair of nuclear power plant steam generators.

5. Decade shall not make any copy or in any way reproduce or excerpt the Westinghouse proprietary information to be held in confidence hereunder, except for the purpose set forth in paragraph 1 above (provided that all such excerpts and copies include Westinghouse's proprietary markings) without the prior written consent of Westinghouse. If Decade wishes to file a document as permitted in paragraph 1 which contains any Westinghouse proprietary information subject to this Agreement, it shall designate such document as confidential by typing or stamping the phrase "Confidential Pursuant to ASLB Order" on each page thereof.

6. Decade may not assign this Protective Agreement.

7. Westinghouse retains all right, title and interest in and to the proprietary information transmitted under this Protective Agreement. Decade shall return such proprietary information to Westinghouse within ten days of being requested to do so by Westinghouse in writing, unless a contrary order shall be issued by the Atomic Safety and Licensing Board, Atomic Safety and Licensing Appeal Board, Nuclear Regulatory Commission or a federal court. If it has not been requested to do so earlier, Decade will return the Westinghouse proprietary information and any excerpts or copies containing same to Westinghouse within ten (10) days after the completion of this proceeding, including the conclusion of any NRC or judicial review of this proceeding. Whenever Decade returns the Westinghouse proprietary information it shall certify to Westinghouse that it has either destroyed all documents listed thereon or returned them to Westinghouse.

8. It is understood that nothing herein shall be construed as granting or implying a patent right of any kind or as permitting Decade to unfairly obtain the right to use information which becomes publicly known through an improper act or omission on its part.

9. This Protective Agreement shall enure to the full benefit of Westinghouse and shall be enforceable by it.

10. All notices required to be given under this Protective Agreement to Westinghouse shall be in writing and shall be deemed sufficiently given when deposited in the United States mail, registered or certified, postage prepaid, and addressed to Westinghouse at the address set forth below or at such other address as Westinghouse shall disclose in writing:

Westinghouse Nuclear Energy Systems
P.O. Box 355
Pittsburgh, PA 15230

Attention: Mr. Robert A. Wiesemann

AS WITNESS HEREOF, Decade has hereto set its signature to this Protective Agreement.

WISCONSIN'S ENVIRONMENTAL DECADE, INC.

By _____

Title _____

Dated: January 1982

ACKNOWLEDGE

I acknowledge that I have read the foregoing Protective Agreement (concerning disclosure by Westinghouse Electric Corporation proprietary information contained in the "Supplement to Affidavit of Robert A. Wiesemann" dated November 13, 1981) executed by Wisconsin's Environmental Decade, Inc. on January 1982, and I agree to be personally bound by all of the terms and conditions of said Agreement.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

James L. Kelley, Chairman
Elizabeth B. Johnson
Dr. Cadet H. Hand, Jr.

In the Matter of

**Docket Nos. 50-361-OL
50-362-OL**

**SOUTHERN CALIFORNIA EDISON
COMPANY, *et al.***
**(San Onofre Nuclear Generating
Station, Units 2 and 3)**

January 11, 1982

In a Partial Initial Decision, the Licensing Board rules that the seismic design basis for Units 2 and 3 of the facility provides a reasonable assurance of safety against earthquake hazards. The Board also determines that the current state of emergency preparedness is adequate to authorize issuance of a low-power (5% of rated power) license.

**ATOMIC ENERGY ACT: SCOPE OF INFORMATION REQUIRED
FOR OPERATING LICENSE**

The comprehensive investigatory obligations concerning site seismicity set forth in various provisions of 10 CFR Part 100, Appendix A, apply only to applicants for construction permits. Applicants for operating licenses have an "update" obligation under 10 CFR 50.34(b)(1). This requires them to perform such further investigations as may be necessitated by discoveries of new information following issuance of the construction permit to ensure the safety of the facility.

RULES OF PRACTICE: RES JUDICATA/COLLATERAL ESTOPPEL

Evidence that could have been introduced at the contested construction permit proceeding and which was known to the parties and Licensing

Board at that time is excluded from the operating license proceeding on that basis.

Exclusion is enforced despite the fact that the party offering the evidence was not a party to the prior proceeding and the issue to which it relates was not actually litigated and decided. These departures from traditional elements of common-law *res judicata* and collateral estoppel are justified on the basis of unique aspects of the Commission's public interest licensing scheme.

RULES OF PRACTICE: EXCLUSION OF EVIDENCE

Otherwise admissible evidence can be excluded altogether if it lacks any significant probative value.

RULES OF PRACTICE: ADMISSIBILITY OF CONTENTIONS

10 CFR 2.714(b) requires that the bases of contentions be set forth with "reasonable specificity." When a contention is put forward for the first time late in the proceeding after discovery is closed, specificity requirements are quite stringent because discovery is not available as a means of refining the contention.

RULES OF PRACTICE: REOPENING THE RECORD

A licensing board has discretion to decline to reopen the record if it appears that reopening is unlikely to affect the result.

EMERGENCY PLAN: COMPARATIVE RISK ANALYSIS

In the absence of explicit guidance from the Commission, a licensing board should determine upon an application for a low-power license whether the comparative risks involved in low-power versus full-power operations are equivalent, considering the nature of the activities involved and the state of emergency preparedness.

EMERGENCY PLAN: STANDARD FOR LOW-POWER LICENSE

Most appropriate criteria for emergency plans in the low power context is whether the onsite plans meet full power requirements (ignoring any

deficiencies relevant only to full power), plus the ability to communicate with offsite authorities. No advance offsite planning is required.

TECHNICAL ISSUES DISCUSSED

Safe Shutdown Earthquake
Controlling Geologic Feature
Slip Rate Method
Fault Length Method

Strong Ground Motion
Empirical Analysis
Theoretical Modeling
Development of Design Spectrum
Saturation of Seismic Waves
Focusing of Seismic Waves

Risk Analysis of Low-Power Operations

APPEARANCES

Messrs. David R. Pigott, Edward B. Rogin, Samuel B. Casey and John A. Mendez, San Francisco, California, Charles R. Kocher and James A. Beoletto, Rosemead, California, for the Applicants.

Mr. Richard J. Wharton, San Diego, California, for the Intervenors, Carstens, *et al.*, on geology/seismology issues.

Ms. Phyllis M. Gallagher, Anaheim, California, and Charles E. McClung, Jr., Laguna Hills, California, for the Intervenors, GUARD and Carstens, *et al.*, on the low-power operating license motion.

Messrs. Lawrence J. Chandler, Benjamin H. Vogler, Richard K. Hoefling and Donald F. Hassell, Bethesda, Maryland, for the Nuclear Regulatory Commission Staff.

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PARTIAL INITIAL DECISION SCOPE OF DECISION

Southern California Edison Co., San Diego Gas and Electric Co., and the Cities of Anaheim and Riverside, California (the "Applicants") are the joint owners and applicants for operating licenses to cover Units 2 and 3 of the San Onofre Nuclear Generating Station. Review of the application, originally filed in 1977, was (like many similar applications) substantially delayed by the Commission's responses to the Three Mile Island accident.¹ As a result, Unit 2 is virtually completed as this opinion is rendered.

This proceeding was contested with respect to seismic and emergency planning issues. In order to minimize unnecessary delay, the Applicants moved for a fuel-loading and low-power operating license after the seismic hearings were closed and during the emergency planning hearings. The motion was predicated upon a favorable ruling on the seismic issues and a determination that the current state of emergency preparedness at the Station and off site are adequate, given the low risks of a radiological emergency associated with fuel loading and low-power testing.

We now decide the seismic issues in the Applicants' favor by the strong, if not overwhelming, weight of the evidence; we also determine that the current state of emergency preparedness is more than adequate for a low-power license. Accordingly, the Director of Nuclear Reactor Regulation is authorized to issue a fuel loading and low-power operating license to the Applicants for Unit 2. Our decision on the adequacy of emergency plans for full-power operations at Units 2 and 3, the only remaining issues, will come at a later date.

I. FACTUAL AND PROCEDURAL BACKGROUND

A. Site Location and Major Geologic Features.

The San Onofre facilities are located on an 80 acre site within the United States Marine Corps Base, Camp Pendleton, California. The site fronts on the Pacific Ocean and is about five miles down the coast southeast from San Clemente, California.

¹ As the Commission explained in its "Statement of Policy on Conduct of Licensing Proceedings" —

Historically, NRC operating licensing reviews have been completed and the license issued by the time the nuclear plant is ready to operate. Now, for the first time the hearings on a number of operating license applications may not be concluded before construction is completed. This situation is a consequence of the Three Mile Island (TMI) accident, which required a reexamination of the entire regulatory structure. 46 Fed. Reg. 28533, 28534.

Levels of seismic activity vary significantly in different parts of Southern California. The areas of highest seismicity are on and near the San Andreas and San Jacinto fault systems, the present boundary between the Pacific and North American plates. Seismic activity generally decreases westward away from the plate boundary. The nearest approach of these plate boundary fault systems to San Onofre is about forty-five miles. The coastal region around San Onofre has experienced relatively moderate seismic activity during the past two centuries for which historic records of earthquakes exist.²

There are a number of offshore faults in the coastal waters off Southern California, some of which are active. Of greatest concern to San Onofre is an offshore structure beginning with the Newport-Inglewood Zone of Deformation near Long Beach, passing the facility about eight kilometers offshore as the South Coast Offshore Zone of Deformation, and extending south to the San Diego area as the Rose Canyon Fault Zone. This entire structure, extending from near the Santa Monica Mountains to San Diego, is known as the Offshore Zone of Deformation or "OZD."³ As will be seen, one of the disputed issues in this proceeding is whether the OZD is a single, throughgoing fault, or whether it is comprised of separate segments of faults or "zones of deformation."

About one-half mile from the facility the Cristianitos fault is clearly expressed in the sea cliffs. The Cristianitos is the closest significant geologic feature to San Onofre. It proceeds inland from the sea cliffs for about 25-30 miles and appears to die out about one mile offshore.⁴ The Cristianitos has long been considered to be inactive.⁵

The name "Cristianitos" was recently given to a nearby offshore zone of deformation now known as the Cristianitos Zone of Deformation or "CZD." The CZD is located southeast of the plant site, between the site and the OZD.⁶ The characteristics of the CZD were extensively litigated by the parties.

B. Major Regulatory Requirements.

Nuclear power plants must be designed to protect the public from the dangers of radioactive releases that might otherwise be caused by an

² Instrumental records of earthquakes go back only about 50 years. See Findings of Fact 25, 26. Testimony of Stewart Smith at 5-6 and Figures SWS, A-D. Testimony of Jay Smith at 14. Shawn Biehler at Tr. 3987-99.

³ Testimony of Jay Smith at 17-18.

⁴ Testimony of Jay Smith at 37-38.

⁵ See text accompanying note 37, *infra*.

⁶ The most prominent features of the CZD are depicted in Figure DGM-E, accompanying the written testimony of Dr. Moore.

earthquake. The regulations prescribe detailed investigations to be performed and criteria to be applied, to establish the design criteria for a particular site.⁷ We provide next a simplified description of the regulatory framework as a perspective for the discussion that follows.

The linchpin for the regulatory scheme is the "safe shutdown earthquake," or "SSE." The purpose of the SSE determination is "to estimate the magnitude of the strongest earthquake that might affect the site of a nuclear power plant during its operating lifetime."⁸ The SSE is defined as "that earthquake which produces the maximum vibratory ground motion for which [critical plant safety systems] are designed to remain functional." App. A, III(C).

Large earthquakes only occur on pre-existing active faults.⁹ Therefore a particular active fault capable of producing an earthquake, which would in turn generate the strongest ground motion at the site — sometimes called the "controlling geologic feature" — must be selected.¹⁰ Taking into account historic earthquake data, the distinctive geology of the area, prevailing stresses in the earth's crust, and other factors, seismologists make expert judgments about the maximum magnitude earthquake — i.e., the "safe shutdown earthquake" — that could occur on that feature.¹¹ All parties and the Board agreed that the controlling feature for San Onofre is the Offshore Zone of Deformation of "OZD."¹²

There remains for determination the "maximum vibratory ground motion" that an SSE at the location on the fault closest to the site would cause at the site.¹³ This prediction involves not only the magnitude of the SSE, but a number of other factors including distance from the site, seismic wave propagation characteristics of subsoils, and the tendency of seismic waves to attenuate non-uniformly at various distances.¹⁴ The maximum vibratory ground motion is equivalent to the peak sustained horizontal ground acceleration registered on seismographs and measured in units of gravity, "g." It is this peak ground acceleration value — for example,

⁷ These requirements are set forth in considerable detail in "Seismic and Geologic Siting Criteria for Nuclear Power Plants," 10 CFR Part 100, Appendix A.

⁸ *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant) ALAB-644, 13 NRC 903, 913 (1981).

⁹ Testimony of Clarence Allen at Tr. 4870-71.

¹⁰ Appendix A, IV(a)(7).

¹¹ See, e.g., Testimony of Stewart Smith, pp. 4-14 and footnote 54, below.

¹² Although there are, of course, active California faults capable of producing larger earthquakes — for example, the San Andreas — their comparative distance from the site means that resultant ground motion would attenuate below that to be expected from the nearby OZD.

¹³ Appendix A, V(a).

¹⁴ See, e.g., Testimony of Lawrence Wight, pp. 5-14.

0.5g — that is then used as the anchor point in developing a design response spectrum for the facility. Adherence to the response spectrum in the engineering and construction processes is intended to ensure that the reactor's critical safety features would withstand the SSE determined for it.¹⁵

C. The Construction Permit Proceeding.

Units 2 and 3 of San Onofre were authorized for construction in 1973.¹⁶ Then as now, the seismic hazards associated with the site were strongly contested. The single stipulated seismic issue was "whether, assuming the geological model set forth in the Regulatory Staff's Safety Evaluation, 0.67g is a reasonably conservative design basis earthquake . . ." for San Onofre. 6 AEC at 938. Following hearings, the Licensing Board found that 0.67g did represent a reasonably conservative "design basis earthquake."

A few clarifying points are necessary concerning what the construction permit Licensing Board did and did not do, and how its determinations relate to the present case. First, that Board spoke of a "design basis earthquake" determination, not a "safe shutdown earthquake." The two phrases are synonymous, the former phrase being frequently used before the late 1973 promulgation of Appendix A.¹⁷

Second, the Board rather confusingly characterized its 0.67g determination as an "earthquake." As explained above, the "11g" determination denotes the intensity of ground motion to be expected at the reactor site, not the magnitude of an earthquake at its epicenter on a particular fault. In arriving at its 0.67g determination the construction permit board concluded that, among other methods, postulation of an Intensity X earthquake (using the relatively imprecise Modified Mercalli scale) on the OZD was appropriate. 6 AEC at 949. However, that board did not make any explicit finding of a maximum magnitude for a safe shutdown earthquake on the OZD.¹⁸ That is being done for the first time in this proceeding.

Finally, it is important to recognize that the geologic and seismic characteristics of the controlling geologic feature, the OZD, were not litigated and determined at the construction permit stage. The geological "model" proposed by the Staff and the U.S. Geological Survey at that time described the OZD as "an extensive linear zone of deformation, at

¹⁵ See, e.g., Testimony of Robert McNeill, pp. 9-25.

¹⁶ *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), LBP-73-36, 6 AEC 929 (1973).

¹⁷ See Appendix A, Footnote 1. The Licensing Board decision preceded promulgation of Appendix A.

¹⁸ Because the Ms7 SSE now determined for San Onofre confirms the acceptability of the previously determined peak ground acceleration value of 0.67g, the omission of an SSE determination at the construction permit stage turns out to have no effect at the operating license stage.

least 240 km. long . . . and capable of an earthquake whose magnitude could be commensurate with the length of the zone." 6 AEC at 942. This ambiguous language can be read to describe the OZD as a single, "throughgoing" fault. For their part, however, the Applicants viewed the OZD as a series of separate faults and zones capable of producing only small earthquakes. This disagreement was resolved at that time by the Applicants' stipulation to the Staff's "model," but only for the purpose of determining the appropriate design spectrum. The Board approved the Staff model as an appropriately conservative approach, while at the same time noting that there may then have been "a small preponderance of the evidence" in favor of the Applicants' position. 6 AEC at 943. Thus, the actual geologic and seismic characteristics of the OZD were litigated for the first time in this proceeding.

D. This Operating License Proceeding.

1. Preliminary Stages.

In March 1977, the utilities filed their application for operating licenses for Units 2 and 3 of San Onofre. In April 1977, a notice of an opportunity for interested persons to request a hearing was published in the *Federal Register*, 42 Fed. Reg. 18460. Thereafter, several organizations and individuals petitioned to intervene and for a hearing, urging consideration of numerous contentions.

The only intervenor group to be admitted as a party and to participate in the seismic hearing was led by Mr. August Carstens of La Jolla, California. The Carstens group includes several other individuals and an environmental organization, Friends of the Earth.¹⁹ The group was referred to in the hearings as the "Carstens Intervenors" or "Intervenors" and will be referred to similarly in this opinion.

Following an initial prehearing conference, the Board admitted contentions on a variety of subjects, including one broadly-worded seismic contention, as follows:

The seismic design basis for SONGS 2 & 3 is inadequate to protect the public health and safety and does not comply with 10 CFR, Part 100, Appendix A, in that the earthquake which could cause the maximum vibratory ground motion has not been assigned as the safe shutdown earthquake.²⁰

¹⁹ The other individuals in this group are Mrs. August Carstens, Lloyd and Selma Von Haden, Donald May and Mrs. Donif Dazey. Another intervenor organization, GUARD, participated only in the emergency planning phase of the proceeding. The State of California and the California Public Utilities Commission were admitted pursuant to 10 CFR 2.715(c), but took no active part in the proceeding.

²⁰ Order of January 27, 1978, p. 2.

This contention was admitted for discovery purposes only, in the expectation that it would be limited or refined following discovery and prior to hearing.²¹

Except for intermittent discovery, very little happened in this proceeding for the next three years. The NRC Staff's review of Units 2 and 3 was substantially delayed by the necessary diversion of resources to respond to the 1979 Three Mile Island accident. The Staff's Safety Evaluation Report, NUREG-0712, was ultimately issued in February, 1981, and the Advisory Committee on Reactor Safeguards submitted a favorable report on the geology and seismology of San Onofre.²² Further discovery was precluded in late February 1981 by stipulation of the parties; a final prehearing conference was held in late April.

2. Refinement of Seismic Contentions.

A major purpose of the final prehearing conference was to specify and refine the Carstens Intervenors' single, broadly-worded seismic contention, quoted above. This proved to be a complex process. In response to the Board's invitation to submit more specific contentions,²³ the Intervenors proposed fifty-six contentions, all of which were assertedly encompassed within their original broad contention.²⁴ The Applicants counter-proposed four contentions, with which the NRC Staff substantially agreed. The Board heard extended oral argument on these contentions.²⁵

The Board's Order of May 8, 1981, among other things, admitted four contentions substantially as agreed to by all parties and subject to the possibility of expansion upon appropriate further showings by the Intervenors. These showings related to any pertinent additional geological discoveries made after the construction permits and to a range of previously submitted and unduly vague contentions concerning alleged inadequacy of investigations or reviews performed by the Applicants or the Staff. In

²¹ Order of January 27, 1978, pp. 2-3. The Board admitted three other contentions from the Carstens Intervenors, concerning emergency planning, uranium fuel costs and the effects of cavities caused by dewatering activities. The emergency planning contention was later revised and litigated. The other two contentions were dismissed on motions for summary disposition, except that the dewatering contention was partially and conditionally retained in the event that the earlier vibratory ground motion determination were later shown to be incorrect. Order of January 26, 1981. Since we have found that the 0.67g ground motion value assigned at the construction permit stage is appropriately conservative for San Onofre, the dewatering contention is now completely resolved.

²² The ACRS letter report dated February 10, 1981, is included in the record as Appendix C to Supplement No. 1 to the Safety Evaluation Report, Staff Exhibit 1.

²³ Order of March 31, 1981.

²⁴ Intervenors Proposed Agenda and Revised Contentions, dated April 18, 1981.

²⁵ Tr. 312-392.

addition, the May 8 Order ruled out a number of the Intervenor's proposed contentions on various grounds.

The Intervenor and the Staff thereafter filed objections to various other parts of the Order of May 8, but no objections to the admitted contentions were filed by any party. As provided by 10 CFR 2.752(c), we thereafter issued a revised prehearing conference order, making certain minor changes in the contentions as previously admitted.²⁶ We rejected as separate contentions the Intervenor's proposed revisions of their "investigation" contentions. However, we made it clear that the substance of these contentions could be litigated, as relevant, under the admitted contentions.

The contentions, as revised and admitted for the hearing, were as follows:

1. Whether as the result of ground motion analysis techniques developed subsequent to issuance of the construction permit or data gathered from earthquakes which occurred subsequent to issuance of the construction permit, the seismic design basis for SONGS 2 & 3 is inadequate to protect the public health and safety.
2. Whether characterization of certain offshore geologic features as a zone of deformation, referred to as the Cristianitos Zone of Deformation (CZD), or whether any additional information about the CZD which became available subsequent to issuance of the construction permit render the seismic design basis for SONGS 2 & 3 inadequate to protect the public health and safety.
3. Whether the seismic design basis for SONGS 2 & 3 is inadequate to protect the public health and safety as a result of discoveries subsequent to issuance of the construction permit of the following geologic features:
 - (1) ABCD features at the site.
 - (2) Features located at Trail 6, Target Canyon, Dead Dog Canyon, Horno Canyon, and "onshore faults E and F."
 - (3) Such other features as the parties may agree are relevant to the seismology of the SONGS site or with respect to which Intervenor Friends of the Earth makes a threshold showing of relevance.
4. Whether based on the geologic and seismic characteristics of the OZD, including its length assignment of $M_s 7$ as the maximum magnitude earthquake for the OZD renders the seismic design basis for SONGS 2 & 3 inadequate to protect the public health and safety.

²⁶Order of May 28, 1981.

The regulations contemplate that a comprehensive geologic and seismic review of the proposed reactor site will be conducted at the construction permit phase, with an "update" approach sufficing at the operating license stage.²⁷ It is only sensible to determine earthquake hazards inherent in the site before a massive reactor structure is built on it. And once the reactor is built it would usually not be productive to perform for a second time the full review performed at the construction permit stage. Apart from the possibility of newly discovered information, the geologic features of interest to the site, and previously reviewed, will not have changed for tens of thousands to perhaps millions of years, let alone the few years elapsing between the construction permit and operating license stages.

In this case, Contentions 1-3 conform to the "update" pattern; they are limited to developments occurring since the construction permit. However, Contention 4 — by far the broadest and most complex contention — is not so limited in time. It addresses the geologic and seismic characteristics of the OZD and the maximum magnitude earthquake that might occur on it. As explained by the Applicants, who initially offered it as a counter-proposal, Contention 4 "encompasses all of the geology of the structure without really any limitation as to time."²⁸

It may be debatable whether a contention of this breadth is, strictly speaking, required to be litigated in this operating licensing proceeding.²⁹ In a case where the construction permit seismic review is conducted under the present regulations, the issues in this contention would be addressed at that stage; to address them again at the operating license stage would be redundant and wasteful. But the construction permit review in this case preceded promulgation of the present regulations in late 1973; those regulations provide no guidance on the proper scope of operating license reviews in cases like this. In any event, we believe for several reasons that Contention 4's broad scope is only prudent in the circumstances of this

²⁷ The regulations are not as clear as they could be in this regard. It is significant, however, that the investigative obligations of Appendix A are only imposed explicitly on applicants for construction permits. Appendix A, II. An "update" obligation is imposed on applicants for operating licenses by 10 CFR 50.34(b)(1).

The Intervenors argue that the Applicants have violated investigatory obligations imposed by various provisions of Appendix A. See Intervenors' Conclusion of Law D. As we read Appendix A, the cited provisions do not apply to Applicants for operating licenses. Rather, such Applicants have an obligation to perform such further investigations as may be necessitated by discoveries of new information following issuance of the construction permit to ensure the safety of the facility. The Applicants in this case fully discharged that obligation.

²⁸ Tr. 313.

²⁹ The Applicants explained the scope of this contention with reference to the requirements of a Staff standard review plan. Tr. 312-313. While that may have set the parameters of the seismic review as between the Applicants and the Staff, such plans have no legal effect in contested proceedings.

case, whether or not abstract analysis of the regulations indicates it is required.

First, the geologic and seismic characteristics of the OZD, factors crucial to the seismic hazard at San Onofre, were not litigated at the construction permit stage. Second, no maximum earthquake intensity or magnitude was assigned to the OZD. To be sure, the Staff and its consultants made an intensity determination of X on the Modified Mercalli scale for the OZD, but this was never adopted by the construction permit Board. Moreover, this Board does not have very much confidence in the Modified Mercalli scale — based as it is on observations of damage rather than instrument readings — as a basis for predicting ground motions. Instrumented recordings of magnitude are more reliable for that purpose. Although such determinations are inherently imprecise, it is important to determine a maximum magnitude earthquake for the OZD as accurately as possible. Finally, it is significant that all parties stipulated to the substance of Contention 4.

3. The Hearings.

The dates for hearing were being set as the Commission was issuing its "Statement of Policy on Conduct of Licensing Proceedings." Mindful that Unit 2 of San Onofre would probably be completed before we could reach an initial decision, the Board attempted to move the process along "at an expeditious pace, consistent with the demands of fairness." Policy Statement, p.3. We first set the beginning of the evidentiary hearing for June 15, 1981. The Intervenors objected, seeking a postponement until the end of July. Following consideration of their arguments and over the objections of the Applicants and Staff, we granted a week's postponement until June 22.³⁰ We saw nothing during the course of the hearing to indicate that the Intervenors were prejudiced by the hearing schedule.³¹

The hearings began on June 22, 1981, in San Diego, California and, after two short recesses, concluded on August 4, 1981. There were 25 days of hearing; the testimony and cross-examination of 28 witnesses filled almost 7,000 pages of transcript.³² Almost all of the witnesses were of exceptionally high quality, typically exhibiting strong academic credentials

³⁰Order of May 28, 1981, pp. 8-11.

³¹ For example, although the Intervenors cited a need for more time to prepare pre-filed testimony, such testimony was actually filed for only three witnesses, and only one of these (Dr. Brune) had lengthy testimony. The remaining five intervenor witnesses testified under subpoena.

³²The Intervenors had moved prior to hearing for permission to use supervised legal interns to assist in the presentation of their case. The Board granted that request, over the Applicants' and Staff's objection. Order of June 3, 1981. Counsel for the Intervenors in the seismic

and extensive experience. The testimony was buttressed by over 70 exhibits, many of them voluminous. After the record was closed, each party submitted extensive proposed findings of fact and conclusions of law. On the basis of this very substantial record and its thorough analysis by the parties, the Board believes that the issues were thoroughly ventilated.

4. Exclusion of Evidence — The Cristianitos Fault.

Generally speaking, evidence was liberally admitted throughout the hearing. Perhaps the most significant exception was the Board's granting of a motion to strike the testimony and exhibits of an Intervenor witness who was called to prove the seismicity of the Cristianitos fault. The Applicants, supported by the Staff, moved to strike this evidence following its presentation as an offer of proof. They argued that this evidence was based primarily on matters predating the 1973 construction permit proceeding, and that its consideration should therefore be foreclosed.³³ The motion was granted on that ground, and on the independent ground that the witness' presentation lacked any probative value.³⁴ Although our basic reasons for these rulings were given on the record, some additional explanation is warranted in this decision.

(a) Lack of Probative Value.

The lack of probative value ruling was based upon the witness' sketchy qualifications as an expert, the superficiality and questionable accuracy of his pre-filed evidence, and his demeanor upon cross-examination. Each of these bases is, we think, fully reflected in the record, and need not be restated at length here. We will cite as illustrative particular matters that underlay our exclusion ruling on this ground.

This witness was called as an expert in seismology. He holds a BS degree in geology and geophysics. However, he has done no graduate work, nor is he licensed to practice, in those areas. Relevant work experience in seismology might have compensated for these deficiencies, but such experience was not strongly demonstrated. It appeared that most of the witness' recent work experience concerned data collection and retrieval through computer programs. Tr. 4806-08.

proceeding, Mr. Wharton, later expressed his intention not to employ legal interns in that proceeding, but to employ them later in the emergency planning hearing. However, Mr. Wharton did not participate in the emergency planning hearing. As a result, legal interns did not participate in the case at all.

³³Tr. 4593-4600.

³⁴Tr. 5187-5198.

The evidence presented by this witness to demonstrate the seismicity of the Cristianitos fault area was very simplistic. What he did, essentially, was transfer earthquake location data covering the period 1932 to 1980 from the epicenter catalogue published by the California Institute of Technology to a map of the vicinity of the Cristianitos Fault. He then drew error circles of different sizes around the estimated epicenters, the size depending upon the presumed accuracy of the location.³⁵ On the basis of this exercise, the witness concluded that the Cristianitos fault area "has experienced considerable seismic activity in the recent past," and that "at least 20 earthquakes could have occurred on the Cristianitos fault."

The foregoing "analysis" (excepting, possibly, the conclusion) did not require any expertise at all. With minimal instructions, it could have been carried out by practically anybody. Beyond that, the data employed here is questionable from two standpoints. For one thing, the pre-1975 data (the bulk of that used here) has little guarantee of accuracy because of less precise methods then used to locate epicenters; the pre-1971 data is especially open to question. Written testimony, pp. 2-4, Tr. 4798-99. In addition, cross-examination indicated that significant errors may have been made in the purely mechanical transcription of the data. Tr. 4824-30.

To say only that the *area* of the Cristianitos is seismically active adds nothing to what has been generally known for decades. But even in that regard, the witness in effect retracted on cross-examination the only thing he had said in his written testimony about area seismicity — i.e., what he had first characterized as "considerable seismic activity" in the Cristianitos area became on cross-examination merely "non-negligible" seismic activity. Tr. 4836.

More fundamentally, we question whether any useful conclusions can be drawn about the seismicity of the Cristianitos fault itself from this circle drawing exercise. The witness acknowledged that the Caltech catalogue information was not adequate for detailed investigations of fault activity. Tr. 4817. The record reflects that much more sophisticated analyses are required to reach any definite conclusions about a particular fault.³⁶

The Board was also influenced by the witness' demeanor on cross-examination. This is an important but rather ephemeral factor, difficult to tie to particular lines of the record. It was our strong feeling, however, upon listening to cross-examination and asking our own questions, that the witness "lacked the kind of responsiveness and assurance that we expect in a qualified expert." Tr. 5196. We concluded from all of this that the

³⁵ The results of this effort are depicted in Figures 1 and 2 appended to the witness' written testimony.

³⁶ See, e.g., the testimony of Shawn Biehler concerning the relationship of two small 1975 earthquakes to the Cristianitos fault. Tr. ff. 3648.

witness had nothing useful to tell us about seismic conditions affecting San Onofre.

(b) Foreclosure of Issues at the Operating License Stage.

As previously described, the Cristianitos Fault is the closest significant geologic feature to San Onofre. If the Cristianitos were shown to be a capable fault, it would certainly be significant, and perhaps crucial, to the safety of the San Onofre facility. That was the purpose of the evidence we have just described. However, in the circumstances of this case the Board determined that the prior opportunity to litigate the capability of the Cristianitos at the construction permit stage foreclosed the relitigation of that question in this operating license proceeding, absent a sufficient showing of changed circumstances, a showing that was not made.

As far back as 1964 when the construction permit was granted for Unit 1, the Atomic Energy Commission's licensing board referred to the Cristianitos as "an inactive fault."³⁷ However, neither the overall seismicity of the site nor the capability of the Cristianitos was a contested issue in that proceeding.

The Cristianitos and its characteristics received extensive scrutiny in the 1973 construction permit proceeding for Units 2 and 3. The Staff's Safety Evaluation states that —

Although the site is located within 1 mile of the Cristianitos fault zone, exposures of parts of this fault at the coast and at the Plano Trabuco excavations made by the applicant about 16 miles north of the coastal exposure, show that the overlying terrace deposits have not been offset by the fault at these locations. All of the available evidence indicates that the Cristianitos fault is inactive³⁸

Although the seismicity of the site was vigorously contested, no contention was raised and no explicit findings were made about the Cristianitos. The single seismic contention concerned the ground vibrations to be anticipated from the OZD. The most reasonable inference to be drawn from this exclusive focus on the OZD is that the intervenors at the construction permit stage made a conscious decision not to litigate the capability of the Cristianitos. Given the record we have only sketched, it is certain that they actually knew quite a bit about the Cristianitos and its seismic significance, or lack thereof.

³⁷ *Southern California Edison Co., et al.*, 2 AEC 366, 376 (1964).

³⁸ SER, p. 16. The Safety Evaluation also included analyses of the Cristianitos by the U.S. Geological Service. Appendix C, pp. 7-8, 19-22.

The same people and groups comprising the Carstens Intervenors were not intervenors in the 1973 proceedings. However, there is some overlap among the participants. GUARD, another intervenor group, was one of the "Consolidated Intervenors" which litigated seismicity in 1973. This time around, however, GUARD confined its participation to emergency planning issues. The Intervenors' principal witness in 1973, and again in 1981, was Dr. James N. Brune, a highly qualified seismologist from the University of California at San Diego.³⁹ The intervenors in both proceedings were represented by counsel.

In the light of the foregoing factual summary, we turn to the applicable law on foreclosure of issues at the operating license stage which were or could have been litigated at the construction permit stage. We use the term "foreclosure" advertently because, as we shall explain, we do not think that the judicially-developed doctrines of "res judicata" and "collateral estoppel" should be transplanted intact from the civil litigation of private rights to the Commission's publicly-oriented licensing scheme. We view those doctrines as possibly useful guidelines to a sound result, but not as Procrustean beds.⁴⁰

The Supreme Court has stated the doctrines of res judicata and collateral estoppel, as follows:

Under the doctrine of res judicata, a judgment on the merits in a prior suit bars a second suit involving the same parties or their privies based on the same cause of action. Under the doctrine of collateral estoppel, on the other hand, the second action is upon a different cause of action and the judgment in the prior suit precludes relitigation of issues actually litigated and necessary to the outcome of the first action. *Parklane Hosiery, Inc. v. Shore*, 439 U.S. 322, 326 n. 5 (1979).

In its 1974 *Farley* decision,⁴¹ the Appeal Board made it clear that those doctrines could be given effect in licensing proceedings. *Farley* involved an attempt by one who had been an intervenor at the construction permit stage to intervene again at the operating license stage to relitigate exactly

³⁹ The Board wishes to acknowledge the substantial contributions Dr. Brune made to this proceeding on a *pro bono publico* basis, both as a witness and as an expert cross-examiner. Although the conclusions we reach are largely at variance with the views he expressed, we believe that our conclusions are more carefully considered, and therefore sounder, as a result of his participation.

⁴⁰ It is well settled that doctrines developed by the courts do not have to be applied in full rigor to the administrative process. Rather such doctrines can be modified to serve the frequently different objectives of the agencies. See, e.g., *Consumers Power Co. (Midland Plant)*, CLI-74-5, 7 AEC 19, 31 (1974); *United Church of Christ v. FCC*, 425 F.2d 543, 546-550 (1969).

⁴¹ *Alabama Power Co. (Farley Nuclear Plant)*, 7 AEC 210.

the same contentions. Thus it was clear that "all of the essential elements of at least collateral estoppel" were present.⁴² In those circumstances, the *Farley* Board had no occasion to consider whether, as in this case, an issue might be foreclosed, even though not all of the traditional elements of res judicata or collateral estoppel were present.⁴³

There are two elements arguably missing in the present case from the hornbook elements of res judicata and collateral estoppel — identity of parties and full prior adjudication of the issue. We believe that under a functional analysis of the Commission's licensing system, neither of these elements should be considered a prerequisite to foreclosure.

Identity of Parties.

The major reason underlying an identity of parties requirement in the context of judicial enforcement of private rights is to ensure a person's "day in court," a concern grounded in constitutional considerations. Individually owned causes of action are normally treated as property, and property cannot be taken away without due process of law. For example, if both Smith and Jones are injured by Brown's negligence, and Smith sues Brown first and loses, Jones is not barred from suing Brown thereafter.

But there is no valid analogy between a case involving only private property rights and intervention in nuclear power licensing.⁴⁴ Intervenors are not admitted to prove, and we do not sit to enforce, private rights. The only ultimate issues in the case are whether the license application shall be granted, denied, or conditioned. Intervenor groups address those issues from their own perspectives of the public interest. Once this public interest function is recognized, it follows that the identity of the intervenor group in the earlier proceeding is irrelevant.⁴⁵ As we stated earlier on the record:

If, for example, the Sierra Club litigates something in 1973, there is no reason in our view why the Union of Concerned Scientists should be able to litigate the same thing eight years later. Tr. 5192.

⁴²*Id.* at 215.

⁴³ Similarly, subsequent decisions in this agency applying *Farley* have not been factually analogous to this case. See, e.g., *Houston Lighting and Power Co.* (South Texas Project), LPB-79-27, 10 NRC 563 (1979), *aff'd*, ALAB-575, 11 NRC 14 (1980); *Toledo Edison Co.* (Davis-Besse Station), ALAB-378, 5 NRC 557 (1977). Our research has not disclosed any cases, judicial or administrative, completely analogous to this case.

⁴⁴ The Constitutional element is missing altogether. Hearings at the instance of intervenors have been provided for by Congress as a matter of prudence, not constitutional compulsion.

⁴⁵ See *Cleveland Illuminating Co.* (Perry Nuclear Plant), Memorandum and Order of July 28, 1981, slip op., pp. 39-42.

Prior Adjudication.

Under the doctrine of *res judicata*, foreclosure applies not only to matters that were actually litigated, but also to matters that could have been litigated, but were not — so long as both were encompassed within the same “cause of action.” Clearly, the capability of the Cristianitos fault could have been litigated at the construction permit stage in 1973. Given the *Farley* Board’s indication that the construction permit and operating license proceedings can be considered the same “cause of action,”⁴⁶ and putting lack of party identity to one side, foreclosure can be rationalized on a *res judicata* basis in this case.

The reason for the broad “could have been litigated” scope of *res judicata* applies with full force here. Over a century ago, the Supreme Court recognized “the necessity of having the subject of particular litigation, as a whole, at once before the court, and not by piecemeal” *Cromwell v. Sac County*, 94 U.S. 351, 358 (1877). Similarly, it is in everyone’s best interests to have the seismicity of a nuclear power plant site fully and finally explored at the construction permit stage, subject only to the possibility of newly-discovered information being explored at the operating license stage. To be sure, a construction permit intervenor probably will not seek to raise every conceivable seismic contention. As a matter of litigation tactics and husbandry of resources, an opponent of the plant might choose quite selectively among possible vulnerabilities in the site. But the result of such a selective approach should not be that everything unchallenged then should be left wide open for litigation at the operating license stage.

Unlike *res judicata*, decisions cast in the collateral estoppel rubric typically require that the matters in question have been actually litigated and decided in the earlier proceedings.⁴⁷ In the present case, the construction permit board did not make any explicit finding about the Cristianitos fault.⁴⁸ It can be argued that the determination of the OZD as the controlling geologic feature is, by necessary implication, a determination that the Cristianitos is not a capable fault, particularly considering the extensive information before the construction permit board about the

⁴⁶7 AEC at 215, note 7.

⁴⁷*Alabama Power Co.*, *supra* note 41, pp. 213, 217.

⁴⁸The only reference to the Cristianitos in the opinion is in finding 52 at 6 AEC 939. This finding merely describes certain materials in the record.

Cristianitos.⁴⁹ But we prefer to rest our foreclosure decision on a broader ground.

We do not believe that prior litigation and decision of an issue should be a prerequisite to its foreclosure at the operating license stage. Here again, we find no valid analogy between the judicially-developed private rights doctrine of collateral estoppel and the Commission's licensing scheme. Presumably, a major purpose underlying the prior litigation requirement was to ensure that the evidence bearing on the matter was actually marshalled and received objective evaluation. That can only be done by private litigants through actual litigation. But in the nuclear power licensing context, significant safety considerations are reviewed by the Staff and the Advisory Committee on Reactor Safeguards, whether or not they are raised by an intervenor.⁵⁰ With these assurances of impartial review, we believe that it is enough to cause later foreclosure if, as here, the matter was known to and could have been placed in issue before the construction permit board in a contested proceeding.

II. SUMMARY OF DECISIONS ON MAJOR SEISMIC ISSUES

A. Introduction.

This section summarizes the detailed findings of fact in the following section. It includes a statement of each major issue, a description of the positions of the parties and a brief summary of their evidence, and the main reasons for the result we reach. This section provides a relatively brief narrative description of what we have decided, and why — central elements that are sometimes lost in lengthy and technical findings of fact.

⁴⁹ The courts have extended collateral estoppel effect beyond ultimate facts in issue to "mediate" evidentiary facts underlying them. See *The Evergreens v. Nunan*, 141 F.2d 927 (C.A. 2, 1944) (Learned Hand, J.).

⁵⁰ The importance of these reviews has received judicial acknowledgment. See *Union of Concerned Scientists v. AEC*, 499 F.2d 1069, 1077 (C.A.D.C., 1974). Some cases have applied collateral estoppel to an action brought by an individual whose only legal interests were adequately represented in a previous suit brought by an authorized governmental entity. See, e.g., *Southwest Airlines Co. v. Texas International Airlines, Inc.*, 546 F.2d 84 (5th Cir.), cert. denied, 434 U.S. 832 (1977) (As a government empowered to enforce its ordinances, city had represented in prior suit those same interests which private party now sought to litigate); Restatement (second) of Judgments §85(d) (Tent. Draft No. 2, 1975); accord. *United States v. ITT Rayonier, Inc.*, 627 F.2d 996 (9th Cir. 1980), (concurrent state and federal enforcement powers under Federal Water Pollution Control Act established sufficiently close relationship between federal and state agencies such that federal agency collaterally estopped from relitigating issue in federal enforcement action which had already been decided in state enforcement action).

This section is intended not only to explain, but also to supplement the findings of fact. Accordingly, it has independent legal significance. Should any unintended inconsistency arise, however, between this section and our findings, the findings govern.

B. The Safe Shutdown Earthquake.

The required determination of a "safe shutdown earthquake" for San Onofre led the Board and parties to focus on the nearby Offshore Zone of Deformation or "OZD," the controlling geologic feature in this case. This issue was framed in terms of whether the assignment of M_s7 as the maximum magnitude earthquake for the OZD was consistent with its geologic and seismologic characteristics and therefore acceptable from a safety standpoint. The Applicants and staff supported the M_s7 magnitude for the SSE; the Intervenors contended that a substantially higher magnitude should be assigned. The issue was tried along four principal lines of evidence: historic seismicity, the characteristics, particularly the length, of the OZD, and two earthquake magnitude methodologies that had been developed separately by the Applicants and Staff for this case.

The historic seismicity of the OZD in terms of large earthquakes (M_s6 or greater) is sparse. The northern segment of the OZD near Long Beach experienced an instrumented $M_s6.3$ earthquake in 1933. Apparently there have been only two other large earthquakes that may have been associated with the OZD in historic times, one near San Diego in 1800 and a second near San Juan Capistrano in 1812. Both of these earthquakes have been estimated at about $M_s6.5$.

Characteristics and Length of the OZD.

Various geologic characteristics of the OZD, particularly its length, are relevant to its potential for high magnitude earthquakes. As a general proposition, long, "throughgoing" faults are capable of generating large earthquakes, while short, segmented faults tend to produce smaller earthquakes. In the present case, the Intervenors sought to prove that the OZD is a single, throughgoing fault about 400 km long. The Applicants and the Staff maintained that the OZD is only about 240 km long, and that it is segmented into three discrete sections.

The Intervenors pointed to some ambiguous language in the Staff's safety evaluation at the construction permit stage which can be read to imply that the OZD was then viewed as a single fault. However, the Staff testimony in this case rejected that interpretation. It was clear, in any event, that the construction permit Board did not make findings about the characteristics and length of the OZD. The great weight of the evidence in this proceeding refuted the single, throughgoing fault theory of the OZD.

The OZD as a whole is comprised of three distinct segments: (1) the Newport-Inglewood Zone of Deformation (NIZD) to the north, (2) the

South Coast Offshore Zone of Deformation (SCOZD) in the center, (3) and the Rose Canyon Fault Zone (RCFZ) in the south. The OZD is a branching system of faults and folds, the style of which varies from segment to segment. For example, right lateral ("strike slip") displacement is characteristic of the faulting on the NIZD. By contrast, the displacement on the RCFZ is predominantly vertical (the normal faulting pattern). There was substantial, uncontroverted evidence that the NIZD is terminated at its southern end by a prominent geological feature, the San Joaquin Structural High. Similarly, there is a gap between the central segment, the SCOZD, and the southern segment of the OZD, the RCFZ.

The three segments of the OZD described above are collectively about 240 km long. The Intervenor contended that, in addition, the OZD should be viewed as connecting to the south to the Agua Blanca Fault and to the Vallecitos-San Miguel Fault system. These proposed extensions of the OZD would make it about 400 km long and theoretically capable of producing a very large earthquake.

The evidence over the purported connection between the OZD and the Agua Blanca Fault was in dispute. There was some evidence suggesting at least the possibility of such a connection. However, the weight of the evidence was strongly against that possibility. For one thing, there was no evidence to show that the two fault zones had ever been involved in a single seismic event. In addition, significant differences exist between the two zones in their geomorphic features and tectonic activity. There are no demonstrable connections between them.

The Intervenor presented an expert witness who had proposed a connection between the OZD and the Vallecitos-San Miguel Fault system. He admitted that there was no way to physically connect that system and the OZD. His testimony supporting such a connection was based almost entirely upon hypothesis.

The Board rejects the proposed connection between the OZD and the Vallecitos-San Miguel Fault system. Although such a connection seems remotely possible, the weight of the evidence indicates that it is extremely unlikely. The Applicants and Staff presented a strong case against such a postulated connection.

The foregoing evidence focused the Board's attention on the 240 km long OZD as the controlling geologic feature. The next step was to determine the maximum magnitude earthquake that could occur on that feature — i.e., of the safe shutdown earthquake or "SSE." The Applicants and the Staff relied primarily on two methods.

Maximum Magnitude by Slip Rate Method.

One method for determining the largest earthquake a fault is capable of generating is derived from a study of relationships between slip rates and magnitudes of earthquakes that have actually occurred on particular faults. Slip rate is a quantitative measure of fault activity and is derived from the geologic record. Basically, one needs to know how much displacement has occurred on a particular fault and over how long a time period. As a rule of thumb, faults with high slip rates (in excess of two mm per year) can produce large earthquakes (M_S7 or greater). Conversely, faults with low slip rates (less than one mm per year) tend to generate smaller earthquakes.

Although the slip rate study presented by the Applicants contained a number of refinements, both in terms of data base selection and manipulation of data, the basic conceptual approach was fairly simple. They compiled information on slip rates of faults relevant to the San Onofre analysis; for example, only strike/slip faults were examined. They then compiled historic earthquake magnitude data on the selected faults and plotted both the slip rates and magnitude data. By drawing a line bounding the maximum observed earthquakes, they established an "historic earthquake limit." They then performed a second analysis designed to take into account ranges of error in slip rate, and other factors. The bounding line of this analysis produced a "maximum earthquake limit" for the range of faults studied.

One of the principal concerns about the validity of the slip rate method was whether there was an adequate historical data base. This is a valid concern. The historic record of California earthquakes extends back only about 200 years, and the instrumental world record only about 50 years. This is a relatively short record from which to extrapolate conclusions about earthquakes that often have much larger recurrence periods. On the other hand, the study was not limited to California faults and earthquakes; it included data from faults all over the world possessing characteristics common to California strike/slip faults.

In addition, the study identified a large number of low-slip-rate California strike/slip faults which were not used because it was not possible to make an estimate of slip rate. However, none of these faults has actually experienced a large earthquake during the historical period. This substantiates the proposition that faults with low slip rates generally do not produce large earthquakes.

For purposes of this study, it was assumed that the OZD had a slip rate of 0.5 mm per year. This produced a maximum earthquake estimate of $M_S6.5$. Estimates of the slip rate on the NIZD (the northern segment of the OSD) have ranged up to a high value of 0.68 mm per year. Using this

slip rate, the maximum earthquake prediction for the OZD would be M_S7 . The Board views this M_S7 estimate as conservative.

Maximum Magnitude by Fault Length Method.

An alternative method for estimating maximum magnitude earthquakes on faults was developed by Dr. Slemmons, the Staff's consultant and witness. Under this approach, earthquake magnitudes are predicted on the basis of fault length. Dr. Slemmons compiled world-wide data summarizing observations of total fault length and rupture length as a means for relating these facts to the maximum magnitude of an earthquake that might occur on a given fault. He arrived at 22% as the mean rupture length to be expected. The 22% value was in turn derived from earthquakes ranging in magnitude from $M_S8.25$ to $M_S5.9$. For faults with a total length of more than 1,000 km, the average percentage of rupture is about 25 to 30%. In the length ranging from 600 to 1,000 km, the average percentage of the largest observed rupture-to-fault-length is about 22%. Finally, for shorter faults in the range of interest to the OZD, the percentage value is about 15%.

Dr. Slemmons' world-wide data base showed that for faults with a length of more than 1000 km it is possible to have earthquakes of M_S8 or greater. In the range of 400 to 600 km, the maximum values observed decrease to 7 to 7.5. Lastly, for faults comparable to the OZD, the values are around 7 or below. If we assume a 240 km fault length for the OZD and use Slemmons' equation to compute magnitude for 15%, 22% and 30% rupture, we arrive at magnitudes of 6.75, 7.0 and 7.2, respectively.

The Intervenors sought to undercut Dr. Slemmons' analyses and results by adding an additional standard error of deviation to the standard of deviation and other conservatisms already incorporated in his analyses. The Board believes that Dr. Slemmons' analyses are conservative as they were presented. To cite but one example, Dr. Slemmons uses only the largest percentage rupture reported for each fault to obtain the average rupture length for all faults. Addition of another standard of deviation to his calculations would be unwarranted. We believe that the fault length method reinforces the determination reached under the slip rate method — that M_S7 is an appropriately conservative maximum magnitude earthquake for the OZD.

In summary, the Board finds, based upon the geologic and seismic characteristics of the OZD, including its length, that M_S7 is the maximum magnitude earthquake that could occur on the OZD. It is, within the meaning of the regulations, the safe shutdown earthquake for the San Onofre site.

C. Strong Ground Motion.

Although the engineering design basis for the San Onofre plants (referred to here as the "design spectrum") had been established in 1972 based on peak ground acceleration (PGA) data and analytical methods then available, the maximum magnitude earthquake that could occur on the OZD (the SSE) was not then determined. Having now established an SSE of M_{57} on the OZD, the evidence went to demonstrating what ground motions might result at the site from such an earthquake, and to comparing those with the design spectrum motions to which the plants were designed.

This case involved predicting strong ground motions in the "near-field" of a large earthquake. There is no precise definition of "near-field," but there is general agreement that for a large California earthquake, 10 km from the fault qualifies. San Onofre is about 8 km from the closest approach of the OZD.

Perhaps the most serious difficulty in predicting near-field strong ground motion arises from the relatively small data base. Strong ground motion predictions are based upon instrumented recordings which have only been available for about 50 years. During that time, there have been relatively few large earthquakes in geologic settings similar to San Onofre. Fewer still of those earthquakes have been well recorded.

The Applicants nevertheless presented extensive testimony and voluminous exhibits in the strong motion area, making the most of the available data. The Intervenors did not present any similar studies. They took the position that the present data base is too limited to allow confidence in any predictions about strong ground motion. Dr. Clarence Allen, a distinguished seismologist and a subpoenaed witness for the Intervenors, took a middle view. He acknowledged limitations in the present data base, but considered it sufficient to make some useful predictions. The Board agrees with that view.

Empirical Analyses.

The Applicants presented two empirical analyses of strong motion data to determine PGAs that might result at the site from an M_{57} earthquake on the OZD 8 km from the site. Both analyses made use of data bases (not the same) carefully selected to include recordings in the near-field of large earthquakes on strike slip faults, and in reasonably similar geologic settings. Each data base was subjected to regression analysis to determine the site specific accelerations. The results were compared with the corresponding values to which San Onofre Units 2 and 3 had been designed in order to test the adequacy of the design. In all cases the design

parameters were greater than those predicted by the regression analyses, indicating an additional margin of safety in design.

The Board concludes that these empirical studies have substantial probative value. They were independently conducted, produced consistent results, and withstood the test of cross-examination. Although more data in the near-field might give us greater confidence in the results, we nevertheless believe that the available data provides an adequate basis for the conclusions reached.

Theoretical Modeling Studies.

The empirical studies were complemented by theoretical modeling of strong ground motion at the San Onofre site. Theoretical modeling of the physical processes of earthquakes by the use of computers is a relative recent development. This method attempts to correlate observed earthquake phenomena with their possible physical causes through mathematical descriptions and computer simulations. Models provide a sophisticated method for extrapolating site specific ground motions from recorded past earthquakes at other sites. Because models have built into them principles of rupture physics and wave mechanics, fewer data are needed to make extrapolations than from conventional methods.

The modeling studies performed for San Onofre were extremely complex. They produced PGA results well below the 0.67g value embodied in the design spectrum. The studies were the subject of extensive cross-examination and they were also reviewed critically by a Board witness. The questions raised in these discussions typically went to abstruse aspects of the theoretical model. Suffice it to say for our purposes that none of these questions appeared to suggest fundamental flaws in the model; rather, they seemed to relate to refinements that might be made. In any event, the Applicants had responsive answers to all the questions that were raised.

The NRC Staff states that "as of this time, no consensus with sufficient detail exists within the seismological community that would allow the exclusive use of theoretical models in order to estimate ground motion in the near-field." The Board agrees with this observation. Until there is greater experience with modeling techniques, we think it would not be prudent for a licensing board to make definitive determinations about some of the very technical questions that have been raised by critics — unless such determinations are necessary to decide the case, a situation that does not obtain here. However, we believe that the modeling studies performed for San Onofre can be taken into account as further evidence of the adequacy of the design spectrum. We were impressed with the level of effort devoted to these studies. It is particularly significant that their

results were validated against near-field recordings of several California earthquakes in the distance range relevant to San Onofre.

The Intervenors called as a witness Dr. David Boore of the U.S. Geological Survey. Dr. Boore is a coauthor of a recent scholarly paper on predicting strong ground motion. Application of an equation from the Boore paper produced a predicted PGA in excess of the 0.67 PGA now incorporated in the design spectrum. Both the Staff and the Applicants argued that the data base in the Boore paper was biased against accurate predictions in the near-field. The authors appeared to concede that point, noting that "for distances less than 40 km from earthquakes with M greater than 6.6 the prediction equations are not constrained by data, and the results should be treated with caution." The Applicants also stressed that the Boore equations did not take into account the effects of magnitude saturation in the near field, a subject discussed in the findings.

The Board believes that the Boore formula probably does not produce accurate predictions in the near field of large earthquakes. It is particularly significant that when data recorded beyond 50 kilometers are excluded from the analysis, the predicted PGA values are well below the 0.67g previously established for San Onofre.

Development of the Design Spectrum.

The Applicants presented evidence on the development of the engineering design spectrum for the facilities, based upon the results of PGA studies. A number of conservatisms were incorporated into the design spectrum, providing additional margins of safety. Perhaps the greatest conservatism is represented by the fact that the design spectrum for San Onofre was taken directly from the instrumental spectrum derived from predicted PGA data. This is contrary to standard engineering practice, in which the design spectrum is usually scaled down from the instrumental spectrum by taking into account the site geology and characteristics of the structures to be erected. In this case, no allowances were made for mass, depth of embedment or other factors that cause the motions governing structural response to be less than those recorded by free field instruments. In this connection, a Staff witness, Dr. Leon Reiter, testified that he considered the facility, one of at least 30 he has reviewed, to be probably the most conservatively designed.

Other Strong Motion Issues.

Several related matters were considered in connection with the strong ground motion question. The Board finds that some recent recordings of unexpectedly high vertical accelerations are not relevant to the safety of San Onofre. On the question of magnitude saturation, the Board deter-

mines that the existence and significance of that phenomenon were not very convincingly demonstrated. However, the record supports a finding that saturation probably does occur at about $M_s 6.5$ -to-7, and that it probably would result in moderation of peak ground accelerations in the near field.

We also considered the possible effect of focusing of seismic waves (sometimes called directivity) in the San Onofre context. The Applicants proved that the focusing phenomenon, while a matter of some significance, is not of great safety concern. Moreover, the spatial relationship between the San Onofre site and the OZD indicates that high degrees of focusing are not likely to occur there.

D. Newly-discovered Geologic Features.

Several geologic features in the area were discovered after the construction permits were issued in 1973. Testimony was presented concerning whether these features compromised the seismic design of the San Onofre facilities. As matters developed, this contention was essentially uncontested; although the Intervenors questioned the Applicants and Staff witnesses, they did not put on a direct case, and they presented only a few proposed findings.

In 1974 anomalous geologic features were discovered in the rock at or near the site excavation for Units 2 and 3. These features were designated the "A, B, C and D" features by the Applicants and reported to the NRC Staff. The Staff requested the Applicants to perform a study of these features in order to assess the possibility of ground rupture under the reactors. The Applicants thereafter undertook extensive and detailed investigations, and filed a thorough report with the NRC Staff.

The ABCD features are minor features; there has not been any significant movement (displacement) on them for a long time, probably about 100,000 years. These features, which may or may not be of tectonic origin, are referred to variously in the record as "joints," "shears" and "faults." But in view of their small aggregate displacements and the long periods of time since any displacement, it makes no practical difference what label is affixed to them. They have no safety significance for San Onofre.

Several other minor and newly-discovered geologic features were also explored at the hearing. However, the evidence was largely uncontradicted and the Board finds that these features are also of no safety significance.

E. The Cristianitos Zone of Deformation.

Subsequent to the issuance of the construction permit for San Onofre Units 2 and 3, two geologists, Drs. Greene and Kennedy, coined the name "Cristianitos Zone of Deformation" (CZD) for an area of the sea floor lying to the south of the San Onofre site and between the site and the

OZD. Greene and Kennedy, employees of the USGS and the California Division of Mines and Geology, respectively, were subsequently asked by the NRC Staff to review the relationships between the CZD and the OZD. Their review is included in the Staff's Safety Evaluation Report and both appeared as witnesses in the hearings.

Their review characterized the CZD as a zone of fractured and faulted structures consisting of correlatable faults and folds that extended, offshore of San Onofre, to within one kilometer of the OZD. They concluded that the CZD merges with or is truncated by the OZD.

The Intervenors sought to show that movement on the OZD might initiate movement on the CZD and that the onshore Cristianitos fault was a part of the CZD. Under this theory, an earthquake on the OZD might ultimately cause movement on the Cristianitos fault, which closely approaches the San Onofre site.

Greene and Kennedy indicated on maps accompanying their review that there were "data voids" in certain critical areas such that they could not determine precisely how or whether the CZD and OZD are associated. The data voids were extensively explored during the hearings and for compound reasons it became obvious that attempting to collect more data in the data void areas probably would not remove those labels from the maps. Data voids did not necessarily indicate a lack of data; rather the lithology and sediments on the ocean floor and electronics of the method combined in such a way as to make data interpretation difficult or impossible.

The Applicants carried out a massive research program which included both onshore and offshore data gathering. Analysis of that data reveals in a convincing and professional manner that the CZD is an area of relatively minor faults and folds as compared to the OZD. The faults associated with the CZD end at or below the surface with no evidence of seafloor displacement. No faults of the CZD extend onshore and the Cristianitos fault does not have a connection or other structural relationship with the OZD. The evidence supports the conclusion that the last displacement on faults of the CZD occurred in Miocene times, about 5 to 6 million years ago. Thus, even assuming that the CZD and OZD merge, as Greene and Kennedy concluded, the inactivity of the CZD faults means that this merger has no safety significance for San Onofre.

III. FINDINGS OF FACT

A. Introductory Findings.

1. Site Description.

The Applicants' proposed findings of fact begin with groups of introductory and background findings (AF 19-149).⁵¹ Most of these findings are expressly adopted by the Staff (SF 30-32) and none of them are contested. Some of these proposed findings — notably those concerning the characteristics of the OZD — are more appropriately addressed in the context of specific issues. But we believe that the Applicants' proposed findings 47-60, 103-111, 124-125, 133-135 and 139-146 are helpful as introductory material, and we find that they are supported by the record. We are adopting these findings verbatim, as proposed, in the following 37 paragraphs.

Many of the findings incorporate portions of findings proposed by the parties, either verbatim or in close paraphrase. In some cases, we have adopted an entire proposed finding or group of findings exactly as proposed; that is indicated by explicit attribution and/or quotation marks.

2. "The SONGS⁵² site is within the Camp Pendleton Marine Corps base on the coast of southern California, in northern San Diego County, approximately 62 miles southwest of Los Angeles and approximately 51 miles northwest of San Diego." (J. Smith, written testimony, p. 8; Figure JLS-A).

3. "The site lies on a rather narrow, gently sloping coastal plain that extends seaward from the mountain upland on the east and is terminated by a line of sea cliffs having a narrow beach at their base. The sea cliffs rise to heights of 60-100 feet above sea level, and are incised by eroding gullies and large ephemeral streams that drain the mountains northeast and southeast of the site. The major drainage channels are San Mateo Creek approximately 2-3/4 miles northwest of the site, San Onofre Creek approximately 1 mile northwest of the site, and Las Flores Creek approximately 7-1/2 miles southeast of the site." (J. Smith, written testimony, pp. 8-9; Figures JLS-B, JLS-C).

⁵¹ Proposed findings of fact will be cited beginning with an "A" for Applicants, "I" for intervenors and "S" for the NRC Staff followed by "F" for findings and a number for the appropriate paragraph. For example "AF 19" denotes paragraph 19 of the Applicants' proposed findings.

Exhibits ("Ex.") will be cited similarly — e.g., "A. Ex. 25" denotes Applicants' Exhibit Number 25. The Staff's Safety Evaluation Report (S. Ex. 1) is usually cited as "SER."

⁵² "SONGS" is an acronym sometimes used to denote the San Onofre Nuclear Generating Station.

4. "A rectangular area has been excavated approximately 60-80 feet below the original surface of the coastal plain to accommodate the site facilities. The excavated area is bounded by cut slopes that provide excellent exposures of soil and rock units at the site." (J. Smith, written testimony, p. 9; Figure JLS-D).

5. "The beach at SONGS is covered by thin sand layer — up to ten feet thick — and is horizontal for about 50 to 100 feet from the sea cliff before sloping an additional 100 to 150 feet into the tidal zone at a slope of about 5%." (J. Smith, written testimony, p. 9).

6. "The sea floor off San Onofre slopes less than about 1% for the first 13,000 feet, and then 1.25% out to the edge of the continental shelf at a distance of 4.6 miles, where the water depth is about 300 feet. Beyond this the continental slope is also gentle, sloping between 9-10% to a depth of 2400 feet at 8.8 miles from shore." (J. Smith, written testimony, p. 9).

2. Regional Geology.

7. "The geomorphic provinces of southern California display distinctive geomorphic and tectonic characteristics, and thereby provide a useful framework for discussion of regional geology. SONGS lies near the western edge of the Peninsular Ranges Province, which includes the Los Angeles Basin at its north and a series of mountain ranges and valleys trending northwest and extending southward into Mexico. The rocks of this province are chiefly granitic and intrusive rocks that are 80-120 million years old; older rocks of sedimentary and volcanic origin metamorphosed by the intrusive rocks; and marine and nonmarine strata of Late Cretaceous, Tertiary and Quaternary age. The rocks of this province most important to SONGS are the Miocene and younger sedimentary units including the San Onofre Breccia, the Monterey, Capistrano and San Mateo Formations, and Pleistocene terrace and alluvial deposits." (J. Smith, written testimony, pp. 10-11; Figures JLS-E, JLS-F).

8. "West of the Peninsular Ranges Province lies the Continental Borderland Province of southern California. It includes the offshore basins and ridges between the continental shelf and the continental slope approximately 200 miles offshore, the western edge of the Los Angeles Basin and the Palos Verdes Peninsula, and the islands of Santa Catalina and San Clemente. The basement rocks of this province are largely metamorphic, and are referred to as Catalina schist or Franciscan-type basement. The contact between this basement lithology and the granitic or continental basement of the Peninsular Ranges is generally believed to coincide at depth with the Newport-Inglewood zone of folds and faults in the Los Angeles basin. Sedimentary rocks overlying the basement are thick and widespread, and range in age from late Miocene to late Pleistocene age. Stratification of these formations and their contacts with other formations

are readily discernible in offshore seismic reflection profiles because the formations have contrasting geophysical properties which permit recognition of structural features, important time lines, and zones of deformation." (J. Smith, written testimony, pp. 11-12; Figure JLS-E).

9. "North of the Continental Borderlands and Peninsular Ranges Provinces, the east-west trend of the Transverse Ranges Province lies across the northwest grain of California geology. The rocks of the Transverse Ranges include granitic and metamorphic rocks of pre-Tertiary age and deformed Tertiary sedimentary rocks. The transverse orientation of the province is attributed to crustal shortening, folding and uplifting of major blocks within the western part of the province that took place largely prior to about 13 million years ago. Subsequently, thrust faulting has been active along the southern margin, and translation along the San Andreas fault zone has caused a right lateral offset of the eastern end of the province." (J. Smith written testimony, pp. 12-13; Figure JLS-E).

10. "The Salton Trough Province lies east of the Peninsular Ranges, and, at its closest approach, is about 70 miles from San Onofre. It constitutes a series of increasingly broad valleys draining southward toward the Gulf of California. Basement rocks in this province are granitic and metamorphic rocks of pre-Cenozoic age, and they are overlain by thick sedimentary and volcanic rocks of late Tertiary age. Tectonic activity is intense in this province because of translation along the crustal plate-boundary and lateral extension across active spreading centers in the southern part of the province." (J. Smith, written testimony, p. 13; Figure JLS-E).

11. "The tectonic framework of the site region consists of faults and other expressions of deformation. The site region is dominated by the San Andreas fault zone, a crustal dislocation extending over 600 miles from north of San Francisco, south through California and into the Gulf of Mexico, having a cumulative strike-slip displacement of more than 300 miles. Northwest of the Transverse Ranges the fault zone has a relatively simple pattern of long and narrow breaks, whereas to the southeast it bends broadly and splits into the San Andreas and the San Jacinto zones. The entire series of faults constituting the San Andreas-San Jacinto fault zone is about 30 miles wide at the latitude of San Onofre and marks the rupture boundary along which two major crustal plates have been moving for millions of years. The nearest approach of this zone to San Onofre is about 45 miles." (J. Smith, written testimony, p.14; Figure JLS-G; Tr. 808, 813).

12. "Northwest-trending structural zones in southern California came into being about 30 million years ago. Although the San Jacinto fault developed much later, both it and the San Andreas have been continuously active and characterized by high slip rates during Pleistocene time and by

modern seismicity. Surface expression of recent faulting is more prominent and continuous for the San Andreas-San Jacinto zone than for any other fault in southern California." (J. Smith, written testimony, pp. 14-15; Figure JLS-G; Tr. 815-816).

13. "The Whittier-Elsinore fault is roughly parallel with the San Andreas-San Jacinto zone and lies about 23 miles east of SONGS. It extends from the southern boundary of the Transverse Ranges to the Mexican border, a distance of approximately 145 miles. Its principal movements have been a combination of lateral and dip-slip motion. Cumulative horizontal displacement is small, approximately 8-13 km. During the last five million years, major lateral motion on the zone has been buttressed on the north by the Transverse Ranges." (J. Smith, written testimony, p. 15; Figure JLS-G; Tr. 820).

14. "The Santa Monica-Malibu Coast fault is a north-dipping reverse fault forming the northern boundary between the Transverse Ranges and the geomorphic provinces to the south. Although early movement on the fault may have been left-lateral slip, much of the movement during the last five million years has been reverse dip-slip (thrust), reflecting north-south compression associated with the San Andreas stress-strain system." (J. Smith, written testimony, p. 15; Figure JLS-G).

15. "The Newport-Inglewood zone of folds and faults crosses the Los Angeles basin from the northwest, where it is terminated at the surface by the Santa Monica-Malibu fault zone, southward to Newport Beach where it projects offshore to the southeast." (J. Smith, written testimony, p. 16; Figure JLS-G).

16. "The Capistrano Embayment is a north-south trending structural trough about 22 miles long that is bounded by the Cristianitos fault on the east and the San Joaquin Hills on the west. The trough has a narrow wedge-shape that opens southward and is about 9 miles wide at the coast." (J. Smith, written testimony, p. 38).

17. "Mapping and interpretation of subsurface data indicate that the Capistrano Embayment is a downwarp produced by westward extension and gravity sliding in the upper crust between the Cristianitos fault and the Los Angeles Basin between about 10-4 million years before present. Further opening of the Embayment and renewed movement on the Cristianitos fault are precluded now because crustal stresses have changed direction and the Los Angeles basin is now filled with sediments that prevent sliding." (J. Smith, written testimony, p.38; P. Ehlig, written testimony, pp. 17-18, 28-29; Tr. 971-974)."

3. Geologic Evolution of the Region.

18. "The geologic evolution of the SONGS region has been complex and has produced significant structural features and stratigraphic units. Beginning about 200 million years (m.y.) ago eastward subduction in the vicinity of the Peninsular Ranges brought together oceanic crust and continental crust. Sediments accreted against the continental crust during Triassic and Jurassic time, and volcanic rocks were emplaced over them in Late Jurassic and Early Cretaceous time. From 120 m.y. to 85 m.y. ago (Cretaceous time) the sedimentary/volcanic sequence was intruded by granitic batholiths accompanied by uplift and erosion. Subsequent subsidence along the western margin of the Peninsular Ranges permitted the sea to transgress eastward, forming a shoreline and depositing sediments against the batholithic rocks along a tectonic hinge line called the Santillan-Barrera line." (P. Ehlig, written testimony, pp. 4-6; Figures PLE-A, PLE-B).

19. "From Late Cretaceous through Early Miocene time (90-20 m.y. ago), the coastline changed and transgressed landward across the Santillan-Barerra line. During Early Miocene time (about 20 m.y. ago) the shoreline was west of SONGS and trended north-northwesterly." (P. Ehlig, written testimony, pp. 6-7; Figure PLE-C).

20. "Conditions changed radically about 16 m.y. ago (Middle Miocene time), resulting in: the appearance of Catalina Schist at the surface offshore; shedding of schist debris northeasterly to form the San Onofre Breccia; widespread volcanism within and north of the San Joaquin Hills; and crustal extension causing opening of the Los Angeles Basin and development of northwest-trending ridges and basins in the Continental Borderland." (P. Ehlig, written testimony, pp. 7-8; Figures PLE-D, PLE-E).

21. "The Continental Basement of the Peninsular Ranges became juxtaposed with the Franciscan schist basement offshore along a major zone of faulting. The juxtaposition of different basement rocks is important because the two formed in very different environments and indicate emplacement against each other by faulting." (P. Ehlig, written testimony, pp. 8-9; Figure PLE-F).

22. "The contact between the different basement rocks near SONGS probably lies offshore along the OZD, but the presence of a thick sedimentary cover inhibits verification." (P. Ehlig, written testimony, p. 9; Figure PLE-F).

23. "During Middle Miocene time a southward-plunging uplift developed in the San Joaquin Hills simultaneously with emplacement of volcanic rocks and the possible intrusion of gabbro in the underlying basement." (P. Ehlig, written testimony, p. 11).

24. "In the period from 16 to 14.5 million years ago the Los Angeles Basin began to open and subsidence progressed throughout the area to produce a deep water basin conducive to accumulation of laminated

diatomaceous shale of the Monterey formation. The Monterey formation interfingers with massive sandstone deposited as small submarine fans along the coast southeast of SONGS, reflecting the presence of a relatively steep submarine slope along the western margin of the Peninsular Ranges." (P. Ehlig, written testimony, pp. 11-12).

4. Regional Seismicity.

25. "The south coast region has not been an area of high seismic activity during either the instrumental or pre-instrumental historic period dating back to 1769." (S. Smith, written testimony, p. 5).

26. "Although earthquakes less than magnitude 4 are widely distributed over southern California, they show a clustering along major faults on which larger earthquakes have occurred. Localized stress concentrations associated with microearthquakes occurring throughout California have little bearing on the pervasive regional stress required to generate significant damaging earthquakes. No significant zone of seismic activity has existed during the nearly half century during which accurate recording of earthquake location has been possible. This data supports the idea that the principal plate boundary at the latitude of SONGS occurs on the San Andreas and San Jacinto fault systems, and that activity generally decreases westward away from these faults." (S. Smith, written testimony, pp. 5-6; Figures SWS-A, SWS-B, SWS-C, SWS-D; Tr. 1553).

27. "The nature of the stress fields operative at the present time, and at the time of development of the OZD, have been investigated to arrive at an assignment of maximum magnitude. To compare this with the contemporary record of seismicity, earthquake focal mechanisms have been determined to provide the most direct way of estimating slip directions of faults during earthquakes. From the slip direction or focal mechanism during earthquakes, the direction of principal stresses can be inferred." (S. Smith, written testimony, pp. 8-9).

28. "Despite difficulties of limited seismographic coverage up until the last decade in southern California, and the continuing lack of seismographic coverage on all sides of a coastal site, some information on focal mechanisms in the southern California coastal region is available. The principal conclusion drawn from the focal mechanisms, whose pattern is irregular with little preference for any one slip direction, except some preference for a general northerly direction for the compressive axis, is that regional stress levels are not high along the south coast region. If the SONGS areas were part of the active section of a plate margin, much more consistency in focal mechanism and a higher level of seismicity would be expected." (S. Smith, written testimony, pp. 9-10).

29. "Where stress levels are not dominated by a regional stress field, then residual stresses that are much more influenced by local geologic conditions, which are more irregular, will be the ones revealed by current seismic activity." (S. Smith, written testimony, p. 10).

5. Wrench Tectonics.

30. "During the hearing, several attempts were made to characterize the OZD and other faults in terms of "wrench tectonics." Current theories of wrench tectonics attempt to relate certain types and patterns of shallow folding and faulting to horizontal shearing strain within the underlying crystalline crust, based on experimental deformation produced in clay models. In wrench fault modeling, surface deformation develops directly above the shear zone at depth. Consequently, such deformation cannot be extrapolated for great distances away from the fault to attribute all of the regional deformation to wrench faulting, particularly as suggested by simple laboratory experiments." (P. Ehlig, written testimony, p. 23; Tr. 1023, 1026, 1027).

31. "The basic concepts of wrench tectonics have been known for several decades in association with studies of strike-slip faults, but they have become popular recently because they may permit the identification of zones along which petroleum-bearing structures may occur in a systematic pattern. Because petroleum interest is in the overlying sediments, basement rock at depth is modelled to produce the deformation seen in the near surface, which may not be appropriate for normal rock and which does not indicate what is happening at depth. (P. Ehlig, Tr. 1023). Aside from establishing a sense of shear, however, wrench tectonic concepts do not deal with the nature, origin and causes of deepseated basement deformation." (P. Ehlig, written testimony, pp. 23-24; Tr. 1023).

32. "The theory of wrench fault tectonics makes many simplified assumptions that lead to very simple patterns so that one can explain any pattern of deformation given the right scheme. However, to be correct it is necessary to put the deformation into the context of a given region." (P. Ehlig, Tr. 975).

33. "The concept of wrench fault tectonics as used by Wilcox and others (1973) and Moody and Hill (1956), involves ways to produce every type of deformation seen. This is objectionable because, unless one looks at the details on a local basis, one cannot conclude whether or not something is the result of complex motion in a lateral shear system." (P. Ehlig, Tr. 1030-1031).

34. "Wrenching is the process of deforming near-surface rocks by horizontal shearing strain along a steeply-inclined zone or fault within the underlying basement. A wrench fault is a high-angle strike-slip fault of great linear extent which involves basement deformation. A wrench zone is

a swath of terrane deformed by wrenching prior to and concurrently with strike-slip along the throughgoing wrench fault." (P. Ehlig, written testimony, p. 24).

35. "Among the major weaknesses of wrench tectonic concepts is the fact that local stress fields change orientation through time due to interaction between the crustal plates, with the result that faults and folds formed during one stage of the tectonic evolution of a region may be inactive during a later stage when other types of deformation may be taking place along a new orientation. Furthermore, most of the earth's crust is inhomogeneous and new ruptures tend to follow surfaces of weakness. Thus, the geometry of faulting is influenced by the fabric of the crust and not just the orientation of the stress field. Although wrench tectonic concepts and models may be used to identify wrench zones underlain by deepseated strike-slip faults, the concepts are of little value when interpreting regional tectonic history." (P. Ehlig, written testimony, pp. 25-26).

36. "The OZD does not fit into a wrench tectonic system because of its geologic evolution. For example, assuming the OZD marks the boundary between the Peninsular Range basement and the Catalina Schist, the OZD originated about 15 to 16 million years ago during the Middle Miocene. At that time the OZD was probably part of a system of right-lateral wrench faults which formed the Pacific-North American plate boundary within the California Continental Borderland. Now, however, activity on the OZD is in response to the effects of crustal compression along the Big Bend in the San Andreas fault, or to drag along the plate boundary. Therefore, Quaternary deformation along the OZD is a secondary effect of interaction between the Pacific and North American crustal plates, and the theory of wrench faulting is not applicable to the OZD at the present time." (P. Ehlig, written testimony, pp. 27-28; Tr. 1016).

37. "The northwest-trending faults west of the San Andreas fault to the San Clemente fault are strike-slip faults, but they are not all characterized by exclusive strike-slip motion, they have not all been active simultaneously, and they have not necessarily been part of the plate boundary. Thus, it would be inappropriate to consider them as wrenching the blocks between them." (P. Ehlig, Tr. 1027-1029).

B. The Safe Shutdown Earthquake.

1. Introduction.

Contention 4 states that:

Whether based on the geologic and seismic characteristics of the OZD, including its length, assignment of M_s7 as the maximum magnitude earthquake for the OZD renders the seismic design

basis for SONGS 2 and 3 inadequate to protect the public health and safety.

The Board appreciates the historical perspective presented in the SER (Section 2.5) on Geology, Seismology and Geotechnical Engineering and adopts Findings 13, 15, 16, and 17, in part, of the Staff's Proposed Findings of Fact for review of that historical and factual perspective. These findings relate to conclusions reached prior to construction permit issuance and are adopted and repeated in the following Findings numbered 2 through 5. The Board also appreciated the clear exposition of the different magnitude measurements of earthquake source size as set forth in the SER and in the Staff's Proposed Findings of Fact 23 in part, 24, 25, 26, 27, and 28. These Findings are adopted and repeated as Findings 6 through 11 in the following text. These are not matters in controversy and are adopted here for their explanatory value.

2. "The geology and seismology of the site were reviewed in detail prior to issuance of construction permits for San Onofre 2 and 3 by the Staff of the U.S. Atomic Energy Commission (AEC), the predecessor to the U.S. Nuclear Regulatory Commission (NRC), and its geological and seismological advisors, the U.S. Geological Survey (USGS) and the National Oceanic and Atmospheric Administration (NOAA), respectively. The findings of that review were published on October 20, 1972 as part of the Safety Evaluation Report relating to construction of San Onofre 2 and 3. (SER § 2.5.1.1.) These matters were fully considered by the Atomic Safety and Licensing Board (CP Licensing Board) in a contested proceeding as reflected in its Initial Decision, LBP-73-36, 6 AEC 929, 938-950 (1973)."

3. "A comprehensive geological investigation of the site region performed by the Applicants included detailed examinations of excavation along the Cristianitos fault and of the sea cliff exposures, geologic mapping, and field examinations, and offshore seismic reflection profiles. The information and the data were presented to the AEC in the San Onofre 2 and 3 Preliminary Safety Evaluation Report with amendments, which was reviewed by the Staff and its advisors (SER § 2.5.1.1) and was considered by the CP Licensing Board."

4. "The Staff interpreted the geologic information and data to indicate the existence of a zone of deformation about five miles offshore from the San Onofre site which extends from the Newport-Inglewood fault zone to the north, to the Rose Canyon fault zone to the south. It concluded in the Safety Evaluation Report:

The present evidence indicates an extensive, linear zone of deformation, at least 240 kilometers (km) long extending from the Santa Monica Mountains to at least Baja, California. We and our consultants consider this zone of deformation to be potentially

active and capable of an earthquake whose magnitude could be commensurate with the length of the zone. Onshore, data does not show evidence that there are any faults immediately underlying the planned reactor facilities. Although the site is located within 1 mile of the Cristianitos fault zone, exposures of parts of this fault at the coast and at the Plano Trabuco excavations made by the applicant about 16 miles north of the coastal exposure, show that the overlying terrace deposits have not been offset by the fault at these locations. All of the available evidence indicates that the Cristianitos fault is inactive when evaluated using procedures described in the proposed 10 CFR Part 100, Appendix A, 'Seismic and Geologic Siting Criteria for Nuclear Power Plants,' November 25, 1971. (*Id.*)"

5. "The essence of this conclusion with respect to the offshore geology was expressly adopted by the CP Licensing Board in its Initial Decision (LBP-73-36, *supra*, at 943, Finding 61), as the 'model. . . appropriate . . . for use in evaluating the effect of those facilities on the health and safety of the public.'

6. "In the CP review the Staff and its seismological advisor (NOAA) used a Modified Mercalli Intensity of X to characterize the maximum earthquake that could affect the San Onofre 2 and 3 site. This earthquake was assumed to occur along the Offshore Zone of Deformation (OZD) about five miles from the site. During the OL review the Staff concluded that magnitude is a better indicator of earthquake source strength than intensity. Intensity is a measure of observed damage and felt effects. It depends upon the size of the earthquake, its depth, the distance from the earthquake source, the nature of the geologic materials between the source and the point of observation itself. Although an attempt is made in the intensity scale to account for differences in structural design, it is only done in a very general way. Particular problems are associated with determination of intensities greater than VIII. Very often these intensities are based upon ground failure (landslides, soil liquefaction, etc.) which are very much dependent upon local conditions rather than ground shaking. Many investigators (for example. Nason, 1978; and Tocher and Hobgood, 1978) have suggested great caution in assigning these high intensities. (SER § 2.5.2.3)."

7. "Magnitude is a measure of earthquake source size using instrumental recordings of ground motion at different distances. Different magnitude scales measure different components of motion in different frequency ranges and care must be exercised in choosing the appropriate scale for the intended purpose. Local Magnitude (M_L), the original magnitude scale, was developed from recordings of small earthquakes (M_L less than 5.0) at distances between 20 and 600 km in southern California. It is

determined utilizing the largest ground motion recorded on the Wood-Anderson seismograph. As a result, it is particularly sensitive to short period (about 0.8 seconds) horizontal motion. It is not applicable at distances greater than 500 or 600 km and must be used with great care outside of California. (*Id.*)”

8. “Surface wave magnitude (M_S) was developed subsequently to complement M_L for the earthquakes of greater size and at different locations. It is determined from longer period (20 second) motion. Richter magnitude (M) as it is commonly, but very often not precisely, used is equal to M_L for magnitudes less than about 6 and M_S for larger earthquakes (Nuttli, 1979). (*Id.*)”

9. “The reason M_L cannot be used for larger earthquakes is the apparent saturation of the scale at around $7\frac{1}{4}$. The great San Francisco earthquake of 1906, for example, had an estimated M_S of $8\frac{1}{4}$ while the M_L is only estimated to have been between $6\frac{3}{4}$ and 7 (Jennings and Kanamori, 1979). M_L saturates because the amplitude of the shorter period waves which determine M_L do not simply increase as the fault length increases. As Kanamori (1978) states, ‘The amplitude of seismic waves represents the energy released from a volume of crustal rock whose representative dimension is comparable to the wave length.’ Seismic waves used in the determination of M_L may only reach wave lengths of 6 km. Thus, they cannot be expected to adequately reflect the energy release of earthquakes associated with ruptures tens of kilometers long. Similarly, they do not adequately reflect the seismic moment of such earthquakes. (*Id.*)”

10. “Seismic moment, defined as being equivalent to the product of rigidity, fault area, and fault displacement, is the measure most easily related to geologic fault parameters. (*Id.*)”

11. “In the range of interest for San Onofre (magnitude 6 to 7.5), M_S , determined from waves whose lengths are about 60 km, is more related to seismic moment than M_L . According to Kanamori (1979), at magnitudes greater than 6, the average M_L begins to deviate and becomes less than the average M_S for the same earthquake until the M_L reaches the previously mentioned saturation point of about $7\frac{1}{4}$.⁵³ According to Kanamori’s estimate, an M_S of about 7 would have an average M_L of 6.6 or 6.7. By assuming a simple linear relationship between M_S and M_L , Nuttli (1979) arrives at a similar result. (*Id.*) Thus, in estimating earthquake size from

⁵³ M_S also saturates at about 8.3 and does not reflect the energy release in a truly great earthquake where fault rupture reaches hundreds of kilometers. For this purpose, a new magnitude scale M_W was developed (Kanamori, 1978). For example, the great Chilean Earthquake of 1960 had an M_W of 9.5 while its M_S was only 8.3 (*Id.*)

fault studies in southern California, the most directly relatable magnitude scale based upon rupture lengths less than hundreds of kilometers would be M_S ."

12. References to earthquake magnitude are to M_S in the rest of this decision unless otherwise noted.

13. During the course of the hearings in San Diego numerous, well-qualified witnesses appeared regarding the geology and seismology of the San Onofre region of southern California. This included extensive testimony on the Offshore Zone of Deformation (OZD) and estimates of the maximum magnitude earthquake which might be generated by it.

14. The primary witnesses for the Applicants were Mr. J. L. Smith, Dr. P. L. Ehlig, Mr. E. G. Heath and Dr. S. W. Smith. The Intervenor called Dr. James Brune, Mr. Mark Legg, Dr. Gordon Gastil, Mr. Clarence Allen and Dr. John Anderson. The Staff's witnesses were Mr. A. T. Cardone, Dr. L. Reiter, Mr. J. F. Devine, Mr. R. F. Morris and Dr. D. B. Slemmons. (J. Smith, written testimony; Ehlig, written testimony; Heath, written testimony; S. Smith, written testimony; Brune, written testimony, ff. Tr. 4122, Legg; written testimony, ff. Tr. 5213; Staff Exhibit 1, SER, Sections 2.5.1.2, 2.5.1.11, 2.5.2.1, 2.5.2.3.1, 2.5.2.3.2, 2.5.2.3.4, 2.5.2.4; Cardone, supplemental testimony, ff. Tr. 5560; Reiter, supplemental testimony, ff. Tr. 5566; Slemmons, Tr. 5458; SER, Appendix E and Appendix G).

15. As the hearing progressed, it became increasingly obvious that the state of the art in predicting maximum earthquakes is such that no single approach to the question is accepted as yielding the definitive answer. Moreover, there are a number of ways of estimating the maximum earthquake that could affect a given site. Estimates of maximum earthquakes focus upon nearby faults and the principal factors to be considered include the seismic history of the area, the geologic record of deformation, the regional stress as inferred from focal mechanisms and the faulting characteristics of the particular structure of concern. (S. Smith, written testimony, pp. 4-5.)

2. Historic Seismicity.

16. The area of southern California that includes the San Onofre site has not been an area of high seismic activity in historic times. The historic California record goes back to mission records (1769) and since 1932 we have modern instrumental records. (SER § 2.5.2.2; S. Smith, written testimony, p. 5; FSAR Section 2.5.1.1; Tables 2.5-1 and 2.5-3; Tables 2.5-2 and 2.5-4).

17. Of all the historical earthquakes identified by the Applicants, three are of particular interest. These occurred on November 22, 1800, December 8, 1812 and March 11, 1933. The California Division of Mines and Geology has estimated magnitudes for the 1800 and 1812 events based upon felt reports. The 1800 event was near San Diego, while the 1812 event was near San Juan Capistrano and destroyed the mission there. There were few European settlements in California at the time of these events and the locations ascribed to these earthquakes can only be considered approximations. Both of these early earthquakes were considered to have had magnitudes of 6.5. It is not clear whether this is M_S or M_L , but since the calibration function used to determine magnitude (Toppozada, 1975) used mostly M_S for larger events, it seems reasonable to assume that M_S is the appropriate measure. (SER 2.5.2.3.1).

18. The 1933 earthquake had its epicenter on the Newport-Inglewood fault zone (NIZD) and is the largest instrumentally recorded event in the south coastal area of California. The NIZD is the northern section of the OZD. This earthquake had both an M_S and an M_L of 6.3. (SER § 2.5.2.3.1).

19. A fourth earthquake of note was reported on February 24, 1892. Information on this event is limited to felt reports; it was felt strongly in southern California, southwestern Arizona and Baja California. Based upon interpretations of the felt reports, it was suggested this event, possibly associated with the Agua Blanca fault in Baja California, could have had a magnitude of close to M_S 8. Reinterpretation of the felt reports has led to a more recent and more detailed account which suggests the 1892 event had a magnitude of 6.9 (probably M_S) and was located in the Peninsular Range of northern Baja California. That fault system is believed to be related to the spreading of the Gulf of California rather than the San Miguel Fault Zone or other postulated extensions of the OZD into Baja California. (SER § 2.5.2.3.1).

20. The largest instrumentally recorded earthquake in Baja California of postulated significance to San Onofre was the El Alamo event of February 9, 1956. That earthquake was associated with the San Miguel fault, had a surface rupture length of at least 19 km and magnitudes of M_S 6.8 and M_L of 6.6. Evidence for a connection of the San Miguel fault with the OZD is discussed in subsequent findings. (SER § 2.5.2.3.1).

21. The largest historical earthquakes of use in assessing the maximum earthquake on the OZD are M_S 6.3, 6.5 and 6.5 in southern California and, possibly, M_S 6.8 in Baja California. (*Id.*).

3. Length and Characteristics of the OZD.

22. Two major controversial matters in our hearings focussed upon the OZD and related directly to the magnitude of earthquakes that zone might generate. These were, first, whether the OZD should be treated as a single, throughgoing fault, and, second, whether the OZD extends into Baja California and should be treated as a longer zone than the model that had been assumed at the CP stage. These two matters will be examined, in order, in the following findings.

23. Central to much of the controversy was the precise intent of the quotation appearing in Section 2.5.1.2 (p. 2-34) of the SER taken from the SER at the CP stage which says, "We and our consultants consider this zone of deformation to be potentially active and capable of an earthquake whose magnitude could be commensurate with the length of the zone."

24. Insight into the intent of the above quotation was provided by Staff Witness Devine, an employee of the USGS. Mr. Devine had been involved in the discussions at the CP stage and was a witness in these proceedings. He made it clear that the USGS did not intend to say that the OZD was a single fault capable of rupturing along its entire length in a single event. But they had thought that, given the need for conservatism in nuclear design, the OZD should be viewed as a single zone. Devine, Tr. 5332-33; also see Allen, Tr. 4880).

25. Intervenor Witness Dr. Brune testified that there is no physical reason why an earthquake rupture could not proceed along the whole length of the OZD. Dr. Brune noted that the Imperial fault ruptured along essentially its full length in 1940 and he cited the 1975 study of Clarence Allen showing that the Izu earthquake ruptured nearly 100% of its length in 1930. (Dr. Brune, written testimony, pp. 12, 13, 21, 22).

26. The Board believes that the data from the 1930 Izu earthquake in Japan is not persuasive that the OZD in California may rupture along its full length. Differences in fault behavior appear to exist between different styles of faulting and different tectonic environments. (Heath, Tr. 4044; Reiter, Tr. 5819-20).

27. We believe there are at least two physical reasons why we may disregard the data from Japan. First, there is the general tectonic setting. Japan is characterized as a subduction zone, whereas California is characterized by strike-slip transcurrent faulting. Second, Japan is characterized by checkerboard (or block) faulting and California is characterized by branch faulting. These findings were confirmed by witnesses Brune and Allen (Brune, Tr. 4568; Allen Tr. 4884-85).

28. The 1940 Imperial fault rupture does not produce convincing evidence that a fault, such as the OZD, may rupture along its full length. Witness Slemmons stated that he knew of no case where he was certain that a fault had ruptured for its full length. (Tr. 6244). He noted specifically of the Imperial fault that the 1940 rupture extended nearly the full length of a *segment* of a much larger fault system associated with the plate boundary. (Slemmons, Tr. 6220-21).

29. In response to a Board question, Staff Witness Slemmons stated he thought the OZD could be interpreted as though it was a single continuous fault (Tr. 6317). He also indicated he knew of no physical reason that a fault could not rupture along its entire length (Tr. 6220; 6343). But, this witness also noted that full rupture of the OZD is unlikely based upon the historic record and that the empirical data base does not support such a likelihood (Tr. 6220).

30. Applicants' Witness, Dr. Stewart Smith, offered a physical reason why ruptures in fault systems (zones) do not progress along 100% of the system. He explained that stress conditions in the rupturing surface are no longer high enough to permit breaking and sliding of the materials. This happens at the ends of the faults and leads to ruptures and segments (Tr. 6377-78). He had earlier noted that ruptures are associated with the top 15-20 kilometers of brittle rocks and that earthquakes are derived from changes in this brittle region (Tr. 6376).

31. Numerous witnesses testified that they did not regard the OZD as a single continuous fault. Rather it is a zone of branching faults and folds. (Allen, Tr. 4732, 4880; S. Smith, written testimony, p. 12; Heath, written testimony, pp. 10-12).

32. The weight of the evidence convinces the Board that the OZD is a segmented, branching system of faults and folds and that the assumption of a rupture along its full length is speculative and unreasonably conservative. All of the available data indicates that earthquakes do not actually cause ruptures the full length of the faults on which they occur. Therefore, full length ruptures must not happen for *some* physical reason, simply because earthquake behavior is governed entirely by physical reasons. That we may not know everything there is to know about this phenomenon — just as we do not know everything about the fission process — does not negate its existence. Some further evidence of the segmented nature of the OZD is presented in the following findings.

4. The Offshore Zone of Deformation and Its Segments.

33. From north to south the OZD consists of three tectonic elements as follows: (1) the Newport-Inglewood Zone of Deformation (NIZD); (2) the South Coast Offshore Zone of Deformation (SCOZD); and (3) the Rose Canyon Fault Zone. (Heath, written testimony, p. 10, Figures EGH, A-E).

(a) The Newport-Inglewood Zone of Deformation.

34. Right lateral displacement is characteristic of the style of faulting of the NIZD. (Heath, written testimony, p. 11).

35. The NIZD is about 30 million years old and shows some evidence that it was the plate boundary in the historic past. (J. Smith, Tr. 810-11, 813).

36. The NIZD extends about 45 miles southeastward from the Santa Monica-Malibu fault zone. It changes from well-developed folds and faults in an eschelon pattern across the Los Angeles basin to a series of fault splays essentially unaccompanied by folds in the Newport Beach area adjacent to the San Joaquin Hills. (J. Smith, written testimony, p. 19).

37. The structural counterpart to the San Joaquin Hills can be traced offshore in seismic profiles as a structurally elevated feature transverse to the NIZD. This feature, the San Joaquin Structural High, interrupts the southeast continuation of the NIZD. Structural, gravity and stratigraphic evidence indicate termination of the NIZD against the San Joaquin Structural High. (J. Smith, written testimony, pp. 19-20).

38. Both the Staff and the Applicants concluded that the NIZD is interrupted or terminated at its south end by the San Joaquin Structural High (Applicants' Finding of Fact No. 74-75, Staffs' Finding of Fact No. 38). This conclusion was not spoken to in the Intervenor's Findings of Fact.

39. The Board agrees with the foregoing and found no evidence to controvert this position. The NIZD itself is a zone of segmented faults with intervening folds such that a rupture of its full length seems unlikely, and the weight of the evidence strongly supports the concept that the NIZD is best regarded as a segment of the longer zone referred to as the OZD. We also incorporate here by reference Applicants' Findings of Fact Nos. 64-66, which were uncontested, and which provide additional evidence of the southerly interruption of the NIZD.

(b) The South Coast Offshore Zone of Deformation.

40. The SCOZD extends for about 42 miles from the east flank of the San Joaquin Structural High to slightly southwest of Oceanside. (J. Smith, written testimony, p. 20).

41. The pattern of faulting on the SCOZD is similar to that of the NIZD, but is of a lower level of deformation. (Heath, written testimony, pp. 11; 13-14).

42. It is expressed as a zone of branching and discontinuous faults and folds trending north to northwest and is found only offshore. Prominent elements of the SCOZD are the San Onofre Shelf Anticline, the San Onofre Shelf Syncline and the South Coast Offshore Fault. Other elements include prominent unconformities between stratigraphic units interpreted to be San Onofre Breccia, Monterey and Capistrano Formations. There are, additionally, wave cut platforms and their overlying Pleistocene deposits and minor faults and folds. (J. Smith, written testimony, p. 20).

43. The features noted above are seen in seismic reflection profiles. The length, continuity and apparent displacement on faults diminish upwards and the zone's expression in upper Miocene rocks is a series of short, discontinuous breaks along the crest and flanks of a prominent anticline (*Id.*; also see written testimony, Heath, pp. 13-14).

44. The SCOZD dies out southwest of Oceanside without emerging onshore. (J. Smith, written testimony, p. 20).

45. The Board interprets the SCOZD as the middle segment of the OZD. We note the absence of any data showing continuity with the NIZD, and the differences in displacement between the SCOZD and NIZD, in support of our conclusion. We note, too, the absence of any data showing a single, throughgoing fault on the SCOZD.

(c) The Rose Canyon Fault Zone.

46. The RCFZ extends for about 45 miles southeast of the SCOZD and, on shore, is coincident with a sublinear northwest trending topographic depression from La Jolla Cove south through Rose Canyon. It continues along the east side of Mission Bay to San Diego Bay, where it appears to turn westward and to die out seaward. (J. Smith, written testimony, p. 21).

47. To the north of La Jolla Cove the RCFZ extends to the Oceanside area and either dies out or emerges onshore without connecting to the SCOZD. (*Id.*)

48. Displacement across the RCFZ is predominantly vertical (i.e., normal fault), with the west side up along the northern and southern parts, and west side down in the central part. (*Id.*)

49. The Board has concluded that the RCFZ is an identifiable segment of the OZD and notes the rather different style of displacement displayed by the segment. No evidence of a physical connection via a major throughgoing fault to the SCOZD was presented.

50. By way of summary of the Board's findings concerning the OZD, we note the following matters. The Intervenor's persistently attempted to show that the OZD was controlled by a major, throughgoing fault capable of rupture along its full length. But apart from Dr. Slemmons testimony (Tr. 6317) that he believed the OZD could be interpreted as a single continuous fault, there was virtually no evidence to support this theory. In our hearings the OZD was repeatedly characterized by other witnesses as a segmented zone. The SER and the witnesses for the Applicants, the USGS and the Staff all characterized the OZD as a discontinuous zone divided into three segments, the NIZD, SCOZD and RCFZ. Witness Allen testified that the zone does not contain a single, continuous well defined fault zone (Tr. 4732). The evidentiary record supports the description of the OZD as some 240 km long, composed of a series of discontinuous, short, en echelon fault segments, drag-fold anticlines and synclines, which progressively changes its style of faulting from north to south. Of major significance for us was the uncontested evidence of the San Joaquin Structural High which interrupts or terminates the NIZD at its southern end, a fact which emphasizes the unlikelihood of a throughgoing rupture of the OZD.

51. The Board's findings on the OZD rest heavily upon the exhibits and testimony presented by the Staff and the Applicants. The Intervenor's primary witnesses had not made independent studies of the San Onofre area and that fact was testified to by Dr. Brune (Tr. 4207-4208) and Mr. Legg (Tr. 5156). Nor do the Proposed Findings of Fact of the Intervenor's challenge the findings we have presented other than in their attempt to mischaracterize the OZD as a structure controlled by a single, continuous fault capable of rupture along its full length.

(d) Geologic Evidence of Seismicity.

52. We have already discussed some of the history of earthquakes in the southern California area and will turn now to a brief discussion of an interpretation of prehistoric earthquakes along the OZD. Applicants' witness Prof. S. Smith testified that his investigations of the San Onofre area had revealed a "consistent picture of relative stability over four different time scales involving four different types of data; the instrumental record of half a century, the historic record of several centuries, the geomorphic record of several hundred thousand years, and the geologic record of several million years." He further stated, "By itself, no one of these could be used as conclusive evidence that large earthquakes have not (and will not) occur in this area, but taken together they provide a very strong case for just this conclusion." (S. Smith, written testimony, p. 8).

53. Prof. Smith also testified that the geologic record indicates that earthquakes larger than M_s 6.5-7.0 could not have occurred on the OZD with any regularity for the past one million years. (*Id.*, p. 7; Tr. 1535).

54. Further, Prof. Smith stated it was his opinion that there probably have never been earthquakes as great as M_s 6.5-7.0 on the SCOZD. (Tr. 1537).

55. Lastly, and as reinforcement of our eventual conclusion, we will note that Prof. Smith uses the M_s 7.0 estimate to cover his uncertainty and that he did not think there had been any M_s 6.5 earthquakes on the "offshore zone," nor did he think there would be any in the future. (Tr. 1557).

(e) Proposed Southern Extension of the OZD to the Agua Blanca Fault.

56. Intervenors' witness Legg proposed a connection between the Agua Blanca - Coronado Banks fault and the Rose Canyon Fault under Mexican waters offshore of Baja California. (Legg, written testimony, pp. 2-5; also see Intervenors' Exhibit No. 3, CDMG Map sheet 42).

57. The SER also notes that Legg and Kennedy (1979) stated that a connection of the OZD with the Agua Blanca fault zone was "possible" (SER § 2.5.1.11). (SER Figure 13A and SER, p. E-28 for fault locations).

58. The Intervenors' Proposed Finding of Fact No. 34 states, "The NRC Staff is of the opinion that the OZD may be a branch of the Coronado Banks fault zone and may ultimately connect with the Agua Blanca fault zone. (Supplemental Testimony of Anthony T. Cardone, p. 4, paragraph #4)." While this is accurate, it is taken out of context. The Board notes that witness Cardone, in the same paragraph, noted the difference in activity and geomorphic features of the OZD and Agua Blanca fault zone. The witness also concludes that paragraph by again noting the lower order of tectonic activity of the OZD. (*Id.*; written testimony of witness Cardone follows Tr. 5563).

59. Intervenors' Witness Legg testified that there appeared to be branches of the Agua Blanca fault which he believed to connect with or be related to the offshore branches of the Rose Canyon fault (Legg, written testimony, pp. 3-5).

60. During cross-examination of Mr. Legg the speculative nature of Mr. Legg's proposed connection of the Rose Canyon and Agua Blanca faults was established (Tr. 5230-33).

61. To further examine Mr. Legg's conclusions, the Applicants subpoenaed the records Mr. Legg was relying upon and subsequently recalled their witness, Dr. D. G. Moore, as a rebuttal witness to testify concerning the significance of the data base Mr. Legg had used. (Tr. 6329).

62. The Coronado Banks fault lies about 15 km offshore from Pt. Loma (San Diego). (See SER, p. E-28).

63. Dr. Moore concluded from his study of the subpoenaed documents "that one can say with some assurance that the Coronado Bank fault does indeed connect into the Agua Blanca fault onshore." (Tr. 6342).

64. Dr. Moore also testified that there were no major branches of the Coronado Banks fault which trend to the north such that they would connect to the Rose Canyon fault. (Tr. 6342-6343).

65. Witness Brune had suggested one could connect the Rose Canyon fault to the Coronado Banks - Agua Blanca system via 15-20 km of right stepping faults. (Brune, written testimony, pp. 21-22).

66. Intervenors summarized their findings of the relationship of the OZD to the Agua Blanca fault zone in their Proposed Findings of Fact Nos. 29 through 35. Those findings do not mention the facts and conclusions presented by Applicants' witness, Dr. Moore. (Findings 66 and 67 above).

67. Intervenor's Proposed Finding of Fact No. 35 is prefaced with the word "If," and the Board agrees that, "if" the proposed connections of the OZD and Baja California faults exist, the total length of the OZD could be extended to 250 or 275 km. (Intervenors' Proposed Finding of Fact No. 35 from written testimony of Slemmons, SER at p. E-13).

68. The Board views the weight of the evidence concerning the extension of the OZD (RCFZ) into Baja California waters to argue strongly that this is a most unlikely possibility. The evidence does not rule out such a possibility, however. If the Coronado Banks and Agua Blanca fault system are to be treated as part of the OZD, then clearly this adds another segment to the segmented OZD. No evidence was presented which suggests either recent or prehistoric major events have involved the RCFZ and its proposed southerly extensions in a single event. We view the differences in geomorphic features and in tectonic activity between the RCFZ and its proposed extensions, the absence of demonstrable connections between the zones of concern and the increasing remoteness of the Coronado Banks and Agua Blanca fault zones from San Onofre as strong reasons why we should not seriously consider the possibility of major earthquakes generated by the proposed and hypothetical extension of the OZD.

(f) Proposed Extension of the OZD to the Vallecitos-San Miguel Faults.

69. The possible extension of the OZD into Baja California via a connection of the RCFZ to the Vallecitos-San Miguel faults is discussed in the SER. (SER § 2.5.1.11; also see FSAR 361.66.2).

70. The Staff's Proposed Findings of Fact review the position presented in the SER (Findings 86 through 89) and conclude that the lineament of the structures concerned is not an expression of faulting of the type that would be needed to connect the OZD with the Calabasas-Vallecitos-San Miguel fault zone. (Staff's Finding of Fact No. 89 and SER § 2.5.1.11, pp. 2-44).

71. Dr. Gastil, who had proposed a connection of the OZD to the Vallecitos-San Miguel Fault system, appeared as a subpoenaed witness for the Intervenors. (Tr. 5113-5139 and 5883-5913).

72. The Intervenors, in their findings concerning the extension of the OZD, review the materials in the SER (Intervenors' Findings Nos. 14 and 15), the testimony of Michael Kennedy (Tr. 2262-63) showing that the Rose Canyon fault extends to the Mexican border (Intervenors' Findings Nos. 11, 12 and 13), and the testimony of Dr. Gastil (Intervenors' Findings Nos. 16 through 28) in support of possible connections between the OZD and the Vallecitos-San Miguel fault zone.

73. Dr. Gastil admitted there was no way to physically connect the OZD to the Vallecitos-San Miguel fault zone. Dr. Gastil's testimony concerning connections of the OZD to these faults and of those to one another was based upon hypotheses (Tr. 5131, 5134, 5136) and faith (Tr. 5910-5911).

74. The Board rejects the concept that the OZD continues into Baja California and connects with the Vallecitos-San Miguel fault zone. Although such connections are remotely possible, they are extremely unlikely. We adopt Applicants' Proposed Findings of Fact Nos. 80 through 88 and Nos. 171 through 174 as the better interpretation and a more factual statement of the relationships of the concerned structures, and repeat those as the following findings numbered 75 through 87.

75. "Applicants have on several occasions investigated faults in Baja California that lie southerly of the Rose Canyon fault zone to determine whether they are related to the OZD. The investigations involved at least ten days and included literature review, or examination of aerial photographs, and field reconnaissance. The faults in question are the Vallecitos fault, the Tijuana lineament, and the San Miguel fault. (P. Ehlig, written testimony, pp. 29-33; Tr. 1086-1088)."

76. "There is no apparent association between the Rose Canyon fault and the Vallecitos fault because the northern end of the Vallecitos either dies out or is overlapped by Eocene-age conglomerate, and no lineament or other features suggestive of a through-going fault along the projected trend of the Vallecitos fault can be observed in aerial photographs. Furthermore, in a few places northeast-trending geologic features extend without visible offset across the projected trend of the Vallecitos fault. (Ehlig, written testimony, pp. 29-30; Tr. 975-977; S. Smith, Tr. 6376)."

77. "The San Miguel and Vallecitos faults are roughly parallel with each other, and are right stepping en echelon, but they do not align with the Rose Canyon fault, and the Vallecitos and Rose Canyon do not fit an en echelon model. (Ehlig, Tr. 975-977, 1080)."

78. "The Imperial fault and the Cerro Prieto fault are not aligned with each other but are separated by an active spreading center. Consequently there is a mechanism there for transferring the motion from one nonaligned fault to the other. However, no such mechanism exists between the Vallecitos and San Miguel faults in Baja California. (Ehlig, Tr. 1076-1077)."

79. "Evidence for a possible concealed fault along the Tijuana Valley is equivocal, and the causes of the so-called Tijuana lineament may result from other than faulting. Within exposed basement rock terrane there is no northwest-trending feature nor geomorphic evidence coinciding with a hypothetical fault along the Tijuana lineament, suggesting that the lineament is not a fault-controlled feature and does not connect with the Rose Canyon fault. (Ehlig, written testimony, pp. 30-31; Tr. 1074, 1085-1086)."

80. "In southern California and Baja California it is possible to have a deep linear fault in the basement rock that does not express itself at the surface only if the displacement is very small and only if the rocks are reasonably flexible, such as sediments or sedimentary rocks. (Ehlig, Tr. 1077). In very rigid rocks exposed at the surface, it is not possible to have a throughgoing zone without having some combination of surface interconnection between the various faults. (Ehlig, Tr. 1078). Therefore, it is not theoretically possible for the RCFZ, the Vallecitos fault zone, and the San Miguel fault zone to be connected by a deep linear break in the basement rock. (Ehlig, Tr. 1079; S. Smith, Tr. 6378)."

81. "Investigation of the area between the southern extent of the Vallecitos fault and the San Miguel fault indicates there is no apparent relationship between the two faults. They have subparallel trends, but remain about 7 km apart at their closest approach. Both faults have small displacements, and the Vallecitos fault appears to be old, and inactive. (Ehlig, the written testimony, p. 31; Figure PLE-P)."

82. "The northern part of the San Miguel fault is overlain by old alluvium many thousands of years old, and displays no evidence of Holocene activity. The San Miguel fault terminates near the northwest corner of Valle San Rafael, and exhibits only about 200 meters of total displacement. The overlapping presence of dikes across the fault precludes the existence of a northwest-trending strike-slip fault of significant displacement along the San Miguel fault. (Ehlig, written testimony, p. 32; Tr. 1069)."

83. "The trace of the Vallecitos fault is well marked by canyons and other topographical features, but geologic contacts appear to extend across the trace without detectable offset. Intrusive dikes and old alluvium lie across the Vallecitos fault and indicate no evidence of young displacement. Gordon Gastil reports no evidence of any Quaternary displacement or even Cenozoic displacement across the Vallecitos fault. Thus, the Vallecitos fault lacks significant displacement in the vicinity of its approach with the San Miguel fault. There is no basis for estimating the slip rate of the Vallecitos fault because there is not solid evidence on the amount of total displacement and the period of time over which it was active. (Ehlig, written testimony, p. 33; Figure PLE-P; Tr. 1070-1071, 1089)."

84. "Geologic evidence suggests that a connection between the Rose Canyon fault and the Vallecitos fault has never happened in the past and there is no reason for us to expect it in the future. (S. Smith, Tr. 6376-6377). For seismological purposes, there is no reason to consider that a single rupture could ever progress along the Rose Canyon/Vallecitos/Calabasas/San Miguel system. (S. Smith, Tr. 6378)."

85. "The mechanical connection between discontinuous fault segments is dependent upon the distance between the ends of the fault segments and the deformation or slip occurring on the fault strands. When the displacement is very large, dramatic kinds of deformation occur in the region between the two fault strands. An example of this is the right-stepping Cerro Prieto-Imperial faults. Between these two strands there is a spreading center and a volcano. If the displacements on the fault strands are small, then the deformation between the fault strands is reduced and often can be accommodated by elastic or plastic distortion. A mechanical connection between the faults is therefore not necessary. Faults represent the accommodation of strain in the crust. If large accommodations are necessary, then connections are necessary as well. If the displacements are small, then short faults can accommodate the displacements and no connection is necessary. (S. Smith, Tr. 6373)."

86. "It is very important to look at the amount of displacement on each of the faults and the style, nature and amount of deformation between the ends of such faults. If there is no significant deformation between them, then there is no need to postulate that they are connected. (S. Smith, Tr. 6374)."

87. "It is not, therefore, a geologically or seismologically plausible scenario that an earthquake on either the Rose Canyon fault or the Vallecitos fault could propagate from one feature to the other. These faults are not connected at the surface, the total displacements along the faults are small, and there is no significant distortion between the offset fault traces. (S. Smith, Tr. 6376)."

88. The Board concludes that the OZD does not connect to the Vallecitos-San Miguel fault zone and rejects Intervenor's Proposed Finding of Fact No. 36. That finding represents unwarranted speculation and is of no real utility in attempting to establish a reasonable basis for estimating the maximum magnitude earthquake to be planned for at the San Onofre site.

89. We have already discussed the history of earthquakes in the area of interest to the site (our findings 16 to 21 above) as well as an interpretation of the prehistoric/geologic record of earthquakes (our findings 51 to 55) and will now consider the seismic potential of the OZD. We note that all parties have essentially concurred that the OZD is the controlling feature for the SONGS site, though the Intervenor's attempt to show that the "Cristianitos Zone of Deformation" (CZD) may represent a capable fault system, and their Proposed Findings Nos. 147-148 speak to that. We will discuss the CZD later.

5. Slip Rate and Magnitude Relationships.

90. One proposed method for determining the maximum magnitude earthquake a fault may generate is derived from a study of the slip rate/magnitude relationships of faults. Slip rate is the distance moved for a given unit of time. Such a method was devised by the Applicants' consultant Woodward-Clyde and was developed by Edward Heath, the Applicants' witness in our hearings. The history of the development of this methodology and the Staff's review of it is presented in the SER §§ 2.5.1.9 and 2.5.1.10 up to the time of the issuance of the SER (February 1981).

91. The Staff, in its Proposed Findings of Fact Nos. 42-59, reviewed the essence of the material in the SER and matters brought forth in the hearings concerning slip rate/magnitude relationships of earthquakes. Their conclusion, concerning the assignment of $M_S 7.0$ as the maximum magnitude earthquake to be planned for on the OZD, is set forth in the Staff's Proposed Finding No. 108(2)(a).

92. Concerning the slip rate/magnitude method, the Applicants, in their Proposed Findings of Fact Nos. 153-157 and 193-221 present detailed findings and references to the record in support of their position that $M_S 7.0$ is the "most conservative maximum magnitude earthquake for the OZD" and that "a reasonable maximum magnitude earthquake for the OZD is $M_S 6-1/2$." (Applicants' Proposed Finding No. 219.)

93. The Intervenor's presented their Proposed Findings of Fact on the slip rate/magnitude methodology in their Findings Nos. 67-95. These findings are critical of the interpretation supported by the Staff and the Applicants, though no independent study of slip rate/magnitude relationships was presented by the Intervenor's.

94. Slip rate is a quantitative measure of fault activity and is derived from the geologic record. Heath characterized his method as a "degree-of-activity approach" which considers the "relative behavior of faults, particularly in terms of strain release or long term slip rates; the size, periodicity, and energy release of seismic events; the mechanical and compositional properties of the faults; and the tectonic setting." Broadly, his approach used "both a qualitative and quantitative comparison of features, such as maximum historic earthquake, fault rupture length, total displacement, degree of deformation, and long-term slip rates" (Heath, written testimony, pp. 6-8).

95. One criticism of Heath's method offered by the Intervenors was that the method was new and untested and had not received adequate scientific peer review (Intervenors' Findings Nos. 67, 68, 70-72 and 88).

96. The Intervenors are correct that the method was developed in 1978 but it has since then been reviewed by the NRC Staff, consultants for the Applicant, the U.S. Geological Survey, the California Division of Mines and Geology and by Dr. Slemmons for the NRC. (Heath, written testimony, p. 24; Tr. 1276-77, 1414, 1433-34, 4044).

97. The proposed method is new, but it is founded on background and work by many investigators which cover many years. (Applicants' Finding of Fact 152). What is strongly convincing of the utility of the approach is the fact that since geologic slip rates reflect average fault displacements over very long intervals of time, the behavior of faults in the past can be evaluated and can provide a basis for projecting the future behavior of the fault. (Heath, written testimony, p. 18). Heath stated the slip rate/magnitude method grew out of the study of comparing faults by their degree of activity and provides a quantitative comparison (Heath, Tr. 1280-1281, 1437).

98. The Board is not inclined to discount the results derived from the slip rate/magnitude study merely because it is a new method. Too, we believe the review of this method before and during the hearings represents a substantial "peer review". We do not suggest that this method standing alone is an adequate basis for assigning the SSE for San Onofre, but we agree with the Applicants, the Staff and Dr. Slemmons that this approach can be properly viewed as one of several approaches to the determination of the maximum magnitude earthquake.

99. In developing the slip rate/magnitude method, the witness Heath developed two new concepts. These were called the Historical Earthquake Limit (HEL) and the Maximum Earthquake Limit (MEL). The development of these concepts is well stated in Heath's Written Testimony, pp. 23-27. (Also see Applicants' Exhibit No. 9, EGH-7; Heath, written testimony, Figures EGH-K and EGH-M).

100. The slip rate data upon which the HEL and MEL are based was compiled from the scientific literature. The data base included the NIZD, other strike slip faults in southern California and other strike slip faults from similar settings around the world. (Heath, written testimony, pp. 23-24, and Applicants' Exhibit No. 9).

101. The Intervenor also made the point that the slip rate magnitude method is limited by the short observational time we have had for historic earthquakes. They argued that the data base of points available is too small to be reliable (Intervenors' Proposed Findings of Fact Nos. 69, 75, 77-83 and 89-91).

102. The Intervenor cite Dr. Slemmons' (at SER, E-7) concern with the short historic record available. (Intervenors' Proposed Finding No. 77). That concern exists, but the Intervenor choose to ignore the final paragraph at SER E-7 to E-8 wherein Dr. Slemmons concluded in his review of fault slip rate that the assignment of the magnitude $M_S7.0$ for the segments of the OZD provided a conservative estimate.

103. We noted earlier that the historical record of earthquakes in California extends back about 200 years and the instrumental record about 50 years. Thus, our historic record is indeed a brief one. This fact, however, does not of necessity negate the utility of the slip rate/magnitude methodology. The Intervenor make much of the fact that the $M_S6.3$, 1933 Long Beach earthquake on the NIZD controls the bounding line for the HEL (Intervenors' Finding of Fact No. 79). What the Intervenor do not cite is the fact that the Applicants identified approximately 230 strike slip faults at least 10 km long in the Coast Ranges, Peninsular Ranges, Mohave Desert and Transverse Ranges of California. Of these, about 180 to 190 were not useable because direct slip rate estimates could not be made. However, none of the 230 faults have had large earthquakes, though some may have been associated with events of less than M_S5 . It would seem reasonable that, given a 200 year history, a few, or at least one, of this large sample of faults with presumed low slip rates (i.e., less than 1 mm per year) should have generated a major earthquake, if such was possible. In the absence of evidence of large earthquakes ($M_S6.5$ or larger) on low slip rate strike slip faults, the Board concludes that the 1933 Long Beach earthquake may very well represent the near maximum earthquake possible on the NIZD. Thus, though we have but a brief historic record, the evidence suggests strongly that it is an adequate historic record for the slip rate method. (Heath, Tr. 1441-1443, 1449-1450, 4037-4038, 4050-4051).

104. There seems little likelihood that faults with slip rates above about 5mm per year have not already been identified and thus there is no

expectation that additional faults can be easily added to the HEL or MEL figures (Figures EGH-K and EGH-M of Heath's written testimony) above that slip rate. (Heath, Tr. 1449-1450).

105. The Board concludes that while the MEL and HEL are based upon a less than optimal data base, it is sufficient to assist the Board in determining the SSE for San Onofre.

106. To obtain the plot referred to as the MEL, Heath added a factor of plus or minus 0.2 magnitude to the M_S values assigned for each earthquake, and he used the range of reported slip rates where the literature contained varying estimates. Thus, each point plotted is surrounded by an "error box" and the MEL line is drawn connecting the lower right corners of the more extreme boxes to enclose all data points. (Heath's Figure EGH-M in written testimony of Heath). The Board finds this is a reasonable and conservative basis for establishing the MEL.

107. Among the varying estimates of slip rate for the NIZD was a high value of 0.68 mm per year. If that rate is used, the MEL predicts that an $M_S7.0$ could be generated by the NIZD. Since this is the highest slip rate estimated for the NIZD, the Board concludes that the estimation of an $M_S7.0$ for the NIZD is a conservative estimate. (See Heath's Figure EGH-M and SER 2.5.1.10).

108. Still another criticism of the slip rate/magnitude method put forth by the Intervenors was that significant data from Japanese faults and the San Miguel fault were not included by Mr. Heath in the data base. (Intervenors' Findings of Fact Nos. 84-87).

109. Dr. Brune was critical of the elimination of the Japanese slip rate/magnitude data by Mr. Heath (*Id.*). However, the Intervenors fail to note that both Mr. Heath (Tr. 4044) and Dr. Reiter (Tr. 5819-5820) justified the elimination of the Japanese data because of the different tectonic environment in Japan.

110. Two of our earlier findings (Nos. 26 and 27) relate to the differences in tectonic setting and faulting in Japan and provide, for us, substantive reasons why data from Japanese faults, earthquakes and slip rates are best not included in analyses for the southern California setting of the San Onofre site.

111. The Applicants' elimination of data on slip rate from the San Miguel fault was for a different reason, namely, the data on total slip and the period of time over which it occurred is inadequate to develop a meaningful slip rate (Heath, Tr. 1486-1487, 1490-1491).

112. The Intervenors in their Proposed Finding No. 84 make much of Dr. Gastil's testimony on his direct knowledge of the San Miguel fault. They chose to ignore the fact that Dr. Gastil freely admitted that he did

not know the slip rate of the Agua Blanca fault (Tr. 5121), and in order to provide an estimated slip rate, they have arbitrarily assigned time periods for the approximately 250 meters displacement described on the San Miguel fault by Dr. Gastil. No factual basis exists to defend that estimate, nor indeed to provide any other than hypothetical slip rates for the San Miguel fault.

113. The Board concludes that the enumerated reasons justify not including data from either Japanese or the San Miguel faults in the data base for Heath's analysis of the MEL. We reject the Intervenor's Proposed Findings as based more upon hypotheses than upon facts.

114. The Intervenor's noted in their Proposed Finding No. 73 that Mr. Heath had no credentials or qualifications in the area of statistics and probabilities (Tr. 1256-1257). They also noted in their Finding No. 76 that Dr. Brune considered Mr. Heath's method to be probabilistic, not deterministic (Brune, written testimony, p. 14).

115. The Board agrees with the preceding paragraph, but we also believe that these matters do not undercut Mr. Heath or his method. Heath's HEL is a plot of historic and factual data, and his MEL, by use of "error boxes", adds significant conservatism to the HEL line. Credentials and qualifications in statistics and probability theory are not needed either to construct or interpret the HEL and MEL. The Board also notes that deterministic findings are not available in this area.

116. The Intervenor's in their Proposed Findings of Fact No. 10 state, "The slip-rate of the Rose Canyon fault is an average rate of 15 cm per thousand years or 1-2 mm per year. (Testimony of Michael P. Kennedy Tr. p. 2258, 1. 2-7)." Unfortunately the Intervenor's have mixed Dr. Kennedy's estimates of the dip separation rate with the horizontal slip rate in their finding. The 15 cm per thousand years of dip separation (Tr. 2258) would yield a rate of 0.15 mm slip per year. Horizontal slip, based upon Dr. Kennedy's estimate of 1 to 2 meters per thousand years, yields a slip rate of 1 to 2 mm per year (Tr. 2354-55). That rate is based upon ancient movement in the Pliocene, i.e., several million years ago (Tr. 2355). Moreover, Dr. Kennedy testified that movement along the fault diminished in the younger overlying rocks and that his 1 to 2 mm per year slip was an average slip for the Pliocene and younger rocks along a segment of the fault (Tr. 2355-56). No estimate of slip rate is available for the younger rocks concerned. The Intervenor's do not further use the incorrect slip rate data cited above. The Board agrees with the Applicant's rejection of Dr. Kennedy's estimate, adopts and incorporates by reference Applicant's Proposed Findings Nos. 204-207 which set forth a more factual and appropriate interpretation of the geology of this area.

6. Fault Rupture Length and Magnitude.

117. We may now focus our attention on another method of estimating the maximum magnitude earthquake likely to be generated on the OZD. We refer here to the work of the Staff's consultant and witness, Dr. Slemmons, having to do with fault rupture length (SER, E-9 to E-16).

118. The Staff's Proposed Findings of Fact Nos. 68-82 reviewed the record concerning fault rupture length and concluded with respect to the OZD that "Postulation of an earthquake in excess of $M_S = 7$ would be inconsistent with the geologic and seismologic evidence of the OZD". (Staff's Proposed Finding of Fact No. 78).

119. The Applicants also treated the rupture length method of determining earthquake magnitude in their Proposed Findings of Fact Nos. 182-192. The Applicants used a broader selection of facts in these findings than those developed by the Staff, but their conclusion does not differ from that of the Staff.

120. The Intervenor's in their proposed findings on the rupture length method present a long, concerted attack on the position reflected in SER, Appendix E, based largely upon their view of the testimony of Dr. Slemmons, Dr. Brune and Mr. Legg. (Intervenor's Proposed Findings of Fact Nos. 41-66).

121. By use of Dr. Slemmons' paper "State-of-the-Art for Assessing Earthquake Hazards in the United States," published in May, 1977 (Table 13) the Intervenor's arrive at a magnitude of 8.6 earthquake for the 240 km long OZD (Intervenor's Finding of Fact No. 42) and a magnitude of 8.89 for the 420 km long OZD plus its assumed extension into Baja California. (Intervenor's Finding of Fact No. 43). Portions of Slemmons' 1977 paper were numbered by the Intervenor's as their Exhibit No. 27 (Tr. 6229), although this Exhibit was never admitted into evidence. There is no support in this record for the suggestion that an earthquake of magnitude greater than $M_S 8$ could occur on the OZD. The Intervenor's references to earthquakes of 8.6 and 8.9 on the OZD are in the realm of fantasy. See testimony of Intervenor's witness Anderson at Tr. 4944.

122. The very high magnitudes noted in the foregoing finding are based on the fact that one of Slemmons' curves (Curve E of Figure 13 of his 1977 paper) is based on mean values with a standard deviation (standard error of estimate) of 0.694. Thus, the curve being used is a mean curve with 50% of the data points higher and 50% lower than that value. To include estimates of magnitude representing 84% of the data one must add and subtract 0.694 (magnitude) to the mean value (Slemmons, Tr. 6229-6231).

123. The Intervenors elicited a wide variety of estimates of maximum magnitude earthquakes in excess of $M_S7.0$, from Dr. Slemmons during their cross-examination based upon adding one standard deviation to the mean value of this witness. These estimates ranged from 7.3 for a 27 km rupture on the SCOZD to 7.8 for a 62 km rupture on that zone. (See Intervenors' Proposed Finding No. 55; Slemmons, Tr. 6242, 6243 and 6269 for examples).

124. The Intervenors also elicited from Dr. Slemmons the estimate, postulating a rupture of 22% of a fault length of 190 km for the OZD, that the mean plus one standard deviation would yield an estimate of $M_S7.6$ (Slemmons, Tr. 6265).

125. The Board does not disagree that, as the Intervenors present in their proposed findings, many numbers in excess of $M_S7.0$ are present in the record. However, these numbers are the result of adding one standard deviation to the mean value, an approach the witness, Slemmons, declined for good reasons to use. (Tr. 6230-6232, 6265, 6270). In Slemmons' opinion, the data base from which the standard deviation had been derived was already overly conservative (Tr. 6265).

126. Dr. Slemmons compiled world-wide data summarizing observations of total fault length and rupture length as a means for relating these facts to the maximum magnitude earthquake that might occur on a given fault. He arrived at 22% as the mean rupture length to be expected. That value had a standard deviation of 7.45%. The Slemmons' method contains built-in conservatism. The Board adopts in the next paragraph Applicants' Proposed Finding No. 183 for the clarity with which it presents the Slemmons' method.

127. "The value of 22% of total fault length used in the evaluation of maximum magnitude has been derived from earthquakes ranging in magnitude from 8.25 to 5.9. For faults with a total length of more than 1000 km, the percentage is around 25-30%. In the length range 600-1000 km, the average percentage of the largest observed rupture-to-fault-length approaches the mean value of 22%. Finally, for faults in the range of interest to the OZD, the percentage value is in the range 15-16%. The standard deviation for the value 22% is 7.45%. Therefore, for faults with a length similar to the OZD, 22% may already be an overly conservative value for assessing rupture length. (Slemmons, Staff Exhibit #1-DBS, Table E-14; Tr. 6285)." (These same facts also appear in Staff's Proposed Finding No. 77).

128. Dr. Slemmons used only the largest percentage rupture reported for each fault to obtain the average rupture length, which also adds conservatism to his estimate. In addition, had he chosen to average the percentage rupture of only those faults of less than 400 km length he would have obtained a percentage between 15 and 16 as a mean value.

That approach would have then yielded the value of about 22% as the mean plus about one standard deviation, while 30% would have represented the mean plus two standard deviations. If we assume a 240 km fault length for the OZD and use Slemmons' equation (SER, Appendix E, pp. E10-E11) to compute the magnitudes for 15%, 22% and 30% rupture, we arrive at magnitudes of 6.75, 7.0 and 7.2, respectively.

129. The Board notes, too, that Dr. Slemmons indicated that his 22% rupture length may already be too conservative (Tr. 6267) and he objected to blindly applying standard deviations throughout his data (Tr. 6268).

130. Dr. Slemmons noted that his world-wide data base showed that for faults with a length of more than 1000 km it is possible to have earthquakes of $M_s 8$ or greater. In the range of 400 to 600 km, the maximum values observed have decreased to 7 to 7.5. Lastly, for faults comparable to the OZD, the values are around 7 or below (Slemmons in Table E-16 of Staff Exhibit No. 1; Tr. 6266-67).

131. The Board places confidence in a final statement elicited from Dr. Slemmons just before he was excused. In response to the question as to Dr. Slemmons' confidence in his estimates of the maximum magnitude earthquake to be assigned to the OZD, Dr. Slemmons responded, "I have high confidence in the magnitude of 7 due to the fact that I, in my opinion the two methods — two independent methods, slip rate and my table on page E16, strongly support a magnitude of about seven." (Tr. 6323).

132. The Intervenor have consistently pursued the hypothesis that rupture of the full length of the OZD (240 km) and its proposed extensions into Baja California (420 km) is possible. Such ruptures, based upon the approach used by Dr. Slemmons in his 1977 paper, might yield earthquakes of $M_s 8.6$ and $M_s 8.9$ (mean plus one standard deviation values). (Intervenors' Proposed Findings of Fact Nos. 42-43).

133. We have earlier reviewed the nature and geologic record of the OZD and its proposed extensions into Baja California. We have rejected the concept that the OZD extends into Baja California and we have concluded that the OZD is made up of three relatively discrete segments. Slemmons' approach (SER, E-11-12) included consideration of rupture of the full length of each segment, events that seem highly unlikely in view of the geologic history and present tectonic setting of the OZD. The approach he preferred was to base his estimate of the SSE on a 22% rupture of the OZD, an approach he considered to be already overly conservative. (Tr. 6267). We regard Intervenor's Proposed Findings Nos. 42 and 43 as inappropriate applications of the Slemmons' method which have no value in assisting us to determine the maximum earthquake to be planned for at the San Onofre site.

134. We concur with the Applicants' and Staff's conclusions that M_{S7} is an appropriately conservative maximum magnitude earthquake to be planned for at the San Onofre site, based on the fault rupture length method.

135. The Staff, in its Proposed Findings Nos. 93-107 reviews "Other Methods for Determining Maximum Magnitude." Those methods include fault displacement, degree of deformation, historical seismicity, surface displacement and fault area. We have already made findings on historical seismicity. We concur with the Staff that the other methods listed cannot be usefully applied to the OZD. The Staff's findings on these other methods are significant in that they, along with the other methods used, represent a broad and multifaceted approach that abandons no possibly useful approach without thoughtful consideration.

136. The Board agrees with Dr. Slemmons that, "The studies for the SONGS site are accurate, represent state-of-the-art methods and form an adequate basis for evaluating the seismic potential of the OZD." (Staff Exhibit No. 1-DBS at E-17).

137. In summary, we have, in essence, rejected the thrust and purpose of the Intervenor's Proposed Findings of Fact and adopted those of the Staff and Applicants. We have found, based upon the geologic and seismic characteristics of the OZD, including its length, that an M_{S7} earthquake is an appropriately conservative maximum magnitude that could occur on the OZD. It is, within the meaning of the regulations, the safe shutdown earthquake for the San Onofre site.⁵⁴

C. Evaluation of Strong Ground Motion.

1. Introduction.

Having established that the occurrence of a maximum magnitude earthquake of M_{S7} is consistent with the geologic and seismic features of the

⁵⁴ In making the SSE determination, the Board is not required to make any period-of-recurrence finding. This is in contrast to the "operating basis earthquake" (OBE), a much less severe event and the "strongest earthquake considered *likely* to occur during the plant's operating lifetime." *Pacific Gas and Electric Co.*, *supra*, note 8, at p. 7. See App. A, III(d). The element of likelihood builds into the OBE determination a probability judgment that a particular magnitude earthquake will occur near the site in a brief geologic time interval. Such judgments can be made about relatively small OBE's because they typically occur much more frequently than SSE's, providing more data on which to base a statistical prediction. The OBE for San Onofre was determined at the construction permit stage and is not an issue in this proceeding.

In a recent Commission order in this case involving emergency planning issues, Commissioner Ahearne expressed his view that an SSE is "a once in thousands of years event." Memorandum and Order dated December 8, 1981, Additional Views of Commissioner Ahearne. Such a recurrence period may describe SSE determinations generally. It would then

(CONTINUED)

OZD, we must determine whether an appropriate relationship exists between that magnitude and the peak horizontal ground acceleration (PGA) determination of 0.67g made at the time of the construction permit. That PGA value served as the anchor point for the design spectrum for the plants.

2. The Board recognizes that this portion of Contention 4 and Contention 1, also directed in major part to the determination of strong ground motion,⁵⁵ cover different time periods; Contention 1 covers only those matters occurring after issuance of the CP, while Contention 4 has no time limitation. We believe that maintenance of that time distinction in these findings would be unnecessary and artificial. Therefore we combine in this section discussion of the strong motion evidence presented under both issues.⁵⁶

be relevant to a rulemaking on the subject of emergency planning and natural disasters, a context in which detailed, site-specific information is not necessary. We want to make it clear, however, that the record on the site-specific seismic issues in this case does not support a thousands of years or, indeed, any specific period-of-recurrence for the San Onofre SSE. No party made any attempt to prove a period-of-recurrence for the SSE of M₅7 postulated on the OZD by the Applicants and the Staff.

Apparently, some useful research is being done on periods-of-recurrence based upon the geologic record of particular faults. For example, we were told that trenching across the Southern San Andreas fault has yielded evidence of the times and magnitudes of past earthquakes and predictions that a great earthquake (M₈ or above) will probably occur there about every 150 years. Testimony of Dr. Clarence Allen, Tr. 4368-69. However, it is impossible to use any direct observation techniques, such as trenching, on the underwater OZD. This problem, coupled with the short instrumental and historic record and the limitations of seismic profiling, suggests to us that no very firm conclusions could be drawn about periods of SSE recurrence on the OZD. The testimony of the Applicants' principal witness in this area supports this view. Dr. Perry Ehlig rejected the idea that specific numerical recurrence values could be assigned to SSE's, in the manner of the Reactor Safety Study, WASH-1400. Tr. 993-997. An Intervenor witness, Dr. Anderson, discussed on cross-examination relationships between recurrence intervals, magnitudes and slip rates, suggesting a long recurrence interval for the OZD. However, he had performed no specific studies of the OZD. Tr. 4914-39.

Even if one could establish a long geologic period of recurrence for an SSE on a particular fault, in order to have an incremental assurance of safety from proof of this nature one would also need to know that the last SSE on that fault occurred only a short geologic time ago. Otherwise, as Dr. Ehlig testified, one must assume that an SSE can occur "at any time." Tr. 993. The record here does not establish when (or whether) an SSE of M₅7 last occurred on the OZD.

⁵⁵ Contention 1 reads as follows: "Whether as the result of ground motion analysis techniques developed subsequent to issuance of the construction permit or data gathered from earthquakes which occurred subsequent to issuance of the construction permit, the seismic design basis for SONGS 2 & 3 is inadequate to protect the public health and safety."

⁵⁶ Other evidence adduced under Contention 1, and a related matter, are addressed in Part III F of this opinion.

3. Witnesses for the Applicants on this portion of Contention 4 were Mr. Lawrence H. Wight, Dr. Gerald A. Frazier, Dr. I. M. Idriss, and Dr. Robert L. McNeill; on Contention 1 they were Dr. Stewart W. Smith, Dr. Gerald A. Frazier, Dr. I. M. Idriss, Dr. Shawn Biehler, and Dr. Robert L. McNeill. Witnesses for the Intervenors were Dr. James N. Brune, Dr. John Anderson, Dr. Clarence Allen, and Dr. David Boore. Staff witnesses were Dr. Leon Reiter and Mr. A. Thomas Cardone. The Board called Dr. J. Enrique Luco.

4. The following quotation from the SER presents useful background for the basis of the specification of 0.67g and its use in the development of the response spectrum for the plants:

In the seismological review conducted for the Construction Permit (CP) of the San Onofre Units 2 and 3 site, the staff relied primarily upon the evaluation provided by the National Oceanic and Atmospheric Administration (NOAA).

[NOAA took the position that:]

"An acceleration of 2/3g, resulting from a strong X intensity (MM) event, (should) be used to represent the ground motion from the maximum earthquake likely to affect this site. However, the accelerogram may contain a few peaks between 2/3 and 3/4g during the 2/3g interval. These accelerations could result from an earthquake occurring within a few miles from the site. Also, it must be assumed that a similar earthquake could occur at any point along this zone of deformation."

The Staff agreed with the NOAA evaluation and on this basis approved the earthquake design bases (anchor points) of 0.67g and 0.33g for the Safe Shutdown Earthquake (SSE) and the Operating Basis Earthquake (OBE) as being appropriately conservative. The FSAR refers to the SSE as the Design Basis Earthquake (DBE). The response spectra used in conjunction with the above acceleration values were developed from a scaled, smoothed, and modified set of real time histories. SER, §2.5.2.1.⁵⁷

5. As Staff observes (SF 115) and Intervenors echo (IF 96, in part), "[d]etermination of ground motion in the near field of large earthquakes is a difficult and problematic task. . . . Since the earthquake assumed to occur on the OZD is also assumed to result from a rupture tens of

⁵⁷ As noted above at page 70, the "design basis earthquake" and "safe shutdown earthquake" are synonymous phrases, although the latter is the prescribed technical term under 10 CFR Part 100, App. A. The Applicants and their witnesses frequently use the phrase "DBE spectrum" in their presentations; we use the phrase "design spectrum" to denote the same concept.

kilometers long and at least 10 km wide (deep), estimation of ground motion at a distance of 8 km from the fault can be clearly considered a 'near field' problem." (SER 2.5.2.4)

6. That there have been relatively few well recorded "large" earthquakes ($M_s > 6$) in tectonic and geologic settings similar to the San Onofre site was not controverted; at issue was whether the data base that has been assembled from such large earthquakes (including certain ones from other parts of the world) includes a sufficient number and range of recordings in the near field to allow a reasoned determination of the adequacy of the seismic design basis for San Onofre Units 2 and 3.

7. Applicants presented extensive testimony directed to empirical evaluations of strong motion data and to the use of models to predict near field accelerations. Intervenors, while presenting no studies of their own,⁵⁸ emphasized their belief that the number of large earthquakes and the information that has been gleaned from them is too limited to allow confidence in evaluations and predictions by any and all of these means. (Brune, written testimony, pp. 3-5) Dr. Clarence Allen, a subpoenaed witness for Intervenors, expressed the view that, while not optimal, there is adequate information. (Allen, Tr. 4665) All witnesses who commented on the extent of the data base would welcome more data.

8. The Board notes that it is indeed seldom that a true researcher feels that he has no need for additional data in his field of investigation. We take note also of the record before us which reflects more than willingness on the part of investigators to incorporate new information into their data bases and to test their theories and assumptions against them. Although there is a sparsity of near-field data, the records from such events as the 1979 Imperial Valley earthquake (IV-79) have done much to improve the situation. (Allen, Tr. 4682; Reiter, supplemental testimony at 3, following Tr. 5566) We agree with Dr. Allen's opinion — that, although the available information is not optimal, it is adequate.

9. There is a relative abundance of data recorded at distances greater than 20 km from a fault rupture, but simple extrapolation of these data to the near field is not straightforward.⁵⁹ Empirical evaluations and, more recently, theoretical models for predicting strong ground motion at various distances have become practical as a result of the development of large digital computers. These techniques are relatively new and there have been few events to try their assumptions. (Brune, written testimony, p. 40)

⁵⁸ Dr. Brune was the only witness for Intervenors who filed written testimony on these contentions; Drs. Anderson, Allen, and Boore appeared under subpoena. Dr. Boore is one of the authors of USGS Open File Report 81-365, which was used extensively in Intervenors' cross-examination of Applicants' witnesses. Dr. Boore's testimony with respect to this report is discussed below, beginning at ¶ 27.

⁵⁹ See the discussion of magnitude saturation at pp. 141-147, below.

10. As the Staff states, "As of this time, no consensus with sufficient detail exists within the seismological community that would allow the exclusive use of theoretical models in order to estimate ground motion in the near field. In the face of the problems (not necessarily the same) associated with either the empirical or theoretical approaches in estimating near field ground motion, it is the Staff's position that the most appropriate way to arrive at an estimate involves the pursuit of both approaches and a conservative comparison." (SF 117; SER § 2.5.2.4) The Board agrees with this Staff position.

11. In order to test the appropriateness (and the possible conservatism) of the value of 0.67g for the PGA, the Applicants contracted several independent studies which approached the question of strong ground motion from the standpoints of both empirical evaluations and theoretical modeling of earthquake phenomena. These we discuss in order.

2. Empirical Evaluation of Strong Ground Motion--Analyses from Similar Earthquakes.

12. Applicants' witness Lawrence H. Wight made use of regression analysis⁶⁰ to test various empirical and physical models. His carefully selected data base originally consisted of "192 horizontal peak ground acceleration (PGA) recordings from 22 earthquakes, as well as source, travel path, and site characteristics such as magnitude, closest distance to the fault rupture surface, site geology, instrument type and location, and size of structure" in which instruments were located. (A. Ex. 11, p. 1-1) The selection criteria for this data base statistically tested and eliminated data irrelevant to this site and resulted in inclusion of records whose quality was certain and whose distance to the rupture surface was adequately defined. Mr. Wight considered that this data base was suitable for ground motion predictions at the San Onofre site (Wight, Tr. 1579) and that it could be used with confidence for this purpose for the following reasons. (1) The average distance between the event and the recording instrument was about 11 km, although the data include recordings in the range between about 3 and 50 km. (Wight, written testimony, p. 7; A. Ex. 11, p. 2-4) Multiple regression analyses were made with magnitude and

⁶⁰ Regression analysis is a statistical analysis, now usually performed by a computer program, whereby sets of data are fitted to an assumed functional relationship (e.g., straight line, polynomial, exponential, Legendre, hyperbolic) among the components of each set of data; the coefficients of the terms in the assumed relationship are determined analytically. Goals are to test the appropriateness of the assumed functional relationship by minimizing the variance between observed and calculated values. Should this variance be considered excessive, the process can be repeated using a different functional relationship. One of the simplest forms of regression analysis is the least squares fitting of data to a curve. Mr. Wight discussed regression analysis as applied to his determination of PGA at Tr. 1625-1627.

distance as variables. (2) The analyses included reverse-fault ground motion, which is approximately 23% higher than the corresponding motion from strike-slip faults, thereby introducing conservatism into the results. (Wight, op. cit., p. 11) (3) The recordings were predominantly obtained from modern-type strong motion instruments in the free field or at the ground level of low buildings situated on recent alluvium; this selection criterion excluded recordings of old earthquakes for reasons detailed at Applicants' Exhibit 11, p. 2-8. However, the magnitude range of these old earthquakes (5.5 to 6.5) were well represented in the data base. (4) The predominant depth of the earthquake fell within 5 to 10 km. Mr. Wight's data base is described at Applicants' Exhibit 11 beginning at 2-4; Appendices A and B of that Exhibit give additional details.

13. A functional form of a relationship among M_S , distance, and PGA was selected that would allow flexibility to fit the data with minimal variance. The coefficients of this relationship allowed testing near-source attenuation of peak acceleration, possible saturation of PGA with very small distances, dependence of peak accelerations near to the rupture surface on magnitude, by employing expressions for the coefficients based on physical phenomena. Nonlinear regression techniques were used to quantitatively evaluate the coefficients. (A. Ex. 11, p. 2-9)

14. Sensitivity analyses were made to determine the "robustness" of the predicted PGAs with respect to the data base and the various assumptions incorporated in the analyses, with the following results: (1) Variations in the predicted PGAs, using different functional forms of the relationships by which the data were fitted, were less than 15%. (A. Ex. 11, p. 3-1 and Table 3-1) (2) Variations in the constraint on the far-field decay rate⁶¹ over the values suggested by the literature demonstrated "remarkable insensitivity" (less than 7%). (*Id.*, p. 3-3) (3) Inclusion of geology type as an independent variable resulted in only a few percent variation in the predictions for all magnitudes of interest. (*Id.*, p. 3-5) (4) Removal of the data of the 1979 Imperial Valley (52 components) and the 1971 San Fernando (44 components) earthquakes from the data base resulted in essentially no change in the predicted PGA for the site. (*Id.*, p. 3-5 and Table 3-3)

15. These analyses of the data base led to a median and 84th percentile prediction of 0.33 and 0.52g PGA at San Onofre as a result of

⁶¹ Far-field decay rate is the rate at which energy propagated through the ground is attenuated (diminished) at distances well removed from the rupture surface.

an M_s 7 event on the OZD. (Wight, written testimony, p. 7; A. Ex. 11, p. 1-2)

16. Subsequent to the completion of this study, the data base was expanded to 229 accelerograms by adding the recordings from five more earthquakes from other data made available and from new recordings. Inclusion of these data in the analyses "simply tightened [the] conclusions regarding . . . ground motion predictions." (Wight, Tr. 1581)

17. The Board finds that Mr. Wight's empirical regression analysis approach to determination of peak ground motion at San Onofre has substantial probative value. Although more data in the near field might give us greater confidence in the results, we believe that the data and the manner of their resolution provide a solid basis for the conclusions reached.

3. PGA and Response Spectra.

18. The peak ground acceleration is simply that of the ground at a specific location; the ground motion at that same location exhibits a spectrum of motions resulting from the influence of the several types and magnitudes of waves (and their velocities through intervening materials) produced by rock breaking. Therefore the selection of the PGA is only the beginning of the process whereby appropriate design criteria can be established to protect a structure. The spectrum of strong ground motion that may occur at the selected site must be established; this is the instrumental spectrum.

19. Traditionally, the design spectrum is derived from the instrumental spectrum by taking into account the site geology and the characteristics of the structure to be erected such as embedment, dimensions, structural materials, and the like. In typical engineering practice, the design spectrum is lower than the instrumental spectrum because of the transfer of energy between structure and ground. (McNeill, Tr. 2641)

20. Finally, the manner in which the structure will respond to the forces acting on it should be determined: will it sway, twist, break? The portions of each of these spectra that are important to a specific project are structure-dependent; for example, components of ground motion having frequencies greater than about 2 Hz are important to power plant safety. (SER, § 2.5.2.4) Consequently, analyses should concentrate on correlations of those frequencies rather than of low frequency motion and isolated high frequency peaks. (SER, § 2.5.2.4) Perusal of the transcript does not inspire confidence that accurate designation of the type of spectrum being ad-

dressed was always made; most of the written testimony is apparently more definitive, as we would expect.^{61a}

21. As noted above, the magnitude of the event that would produce these spectra was not specified at the CP stage. It therefore remained to be demonstrated at the OL stage that the spectra to which the plants were designed would not be exceeded by the spectra that could result from an $M_S 7$ event on the OZD.

22. Prior to 1979, $M_S 6.5$ had been adopted by the Applicants as a working hypothesis as a reasonable maximum earthquake (consistent with the geologic and seismologic features of the OZD) for the purpose of confirming the adequacy of the design spectrum. This work was done under the direction of the Applicants' witness, Dr. Idriss. Subsequently, for additional conservatism, the results of the initial analysis were scaled upward to $M_S 7$. (Idriss, written testimony, p. 8; Heath, written testimony, pp. 16-17) The approach adopted for estimating the characteristics of ground motion resulting from an $M_S 6.5$ earthquake was in many ways similar to that described above in Mr. Wight's work. However this earlier work was carried on independently and for the purpose of developing spectra specific to the San Onofre site. The two investigators made different selections from the available data for their data bases. For instance, Dr. Idriss used recordings from earthquakes of only about $M_S 6.5$, while Mr. Wight included some much smaller earthquakes in order to increase near-field data. Mr. Wight included data from some earthquakes outside the United States, while Dr. Idriss restricted his data to the western United States; however, both restricted their data bases to similar-to-site geology.

23. "The development of site-specific empirical attenuation relationships was accomplished by the selection of earthquake recordings screened according to source factors [approximate magnitude 6.5], travel path [accelerograms recorded in the Western United States], and local site conditions appropriate to the San Onofre site [accelerograms recorded at sites having subsurface conditions similar to those at San Onofre]. A regression analysis of peak acceleration and response spectral values for the selected accelerograms was then performed to derive these relationships . . . The results of the . . . screening process led to the selection of 56 accelerograms obtained during seven earthquakes in the M_L range 6.3 to 6.5 and the M_S range 6.3 to 6.7" with 46 of the records coming from earthquakes of $M_S 6.6$. (Idriss, op. cit., pp. 8-9; see also SER § 2.5.2.4.1)

^{61a} Some of this apparent confusion may stem from the fact, attested to by Dr. McNeill, that the spectrum to which San Onofre was designed was based on the actual ground motion derived for the site, i.e., the instrumental spectrum, not reduced to account for the response of planned structures. See ¶¶ 59 and 60 below.

By mean of the site-specific attenuation relationships established through regression analyses of these data, instrumental spectra were developed for 25 individual periods in the range of 0.04 to 2 seconds. The mean and 84th percentile instrumental peak accelerations determined for $M_{5.5}$ are 0.42g and 0.57g, respectively. Comparison of the 84th percentile instrumental spectrum derived using recorded data with the design spectrum showed that that spectrum exceeds the derived instrumental spectrum at all periods. (Idriss, op. cit., p. 12; A. Ex. 13, Fig. 10)

24. As mentioned above, in 1979 the maximum postulated earthquake magnitude was increased from $M_{5.5}$ to M_7 for additional conservatism. Because there are not as many data for magnitude 7, a scaling law was sought whereby the results of the analyses for $M_{5.5}$ could be reliably extended to M_7 . (Idriss, Tr. 1707) This was prior to the 1979 Imperial Valley earthquake. (Idriss, Tr. 1709) The procedure used for scaling the 84th percentile instrumental peak acceleration and response spectrum is described in Applicants' Exhibit 18. The estimated 84th percentile instrumental peak acceleration for an M_7 was 0.63g.⁶² (Idriss, written testimony, p. 13) Comparison of the 84th percentile instrumental spectrum with the design spectrum (see Idriss, op. cit., pp. 13-14, Figs. IMI-A and B) shows that the design spectrum exceeds the former for both $M_{5.5}$ and M_7 at all periods.

25. The Intervenor's witness, Dr. Brune, expressed his reservations about regression analyses of earthquakes, primarily because of the limited data base. As a scientist, he would prefer to have more data. (Brune, written testimony, p. 54; Tr. 4447-60). However he acknowledged that, if "one feels that it is important, for other reasons, to come up with some prediction curves, one has to do the best one can with the limited data." (Brune, Tr. 4460). Dr. Brune had not performed an independent evaluation of the regression analyses presented in the hearings. (Brune, Tr. 4466-67).

26. The Board finds that the separate empirical study directed by Dr. Idriss lends further support to the adequacy of the design spectrum. It is significant that two, independently conducted, site-specific studies reached consistent results in their ground motion predictions.

4. USGS Open File Report 81-365.

27. USGS Open File Report 81-365, authored by D.M. Boore and W.B. Joyner, is the latest in a series of reports on continuing research by these USGS scientists.⁶³ Dr. Boore appeared as a subpoenaed witness for

⁶² Inspection of Dr. Idriss' written testimony and exhibits indicates that the mean was not scaled to $M_{5.7}$.

⁶³ Open File reports of the USGS are preliminary reports, not subjected to peer or agency review in the usual sense, published in order to make information available to other researchers in a timely fashion. (Reiter, Tr. 5565)

the Intervenor and testified on the differences between this report and its successor, which had been submitted to the Bulletin of the Seismological Society of America (BSSA). This report was referenced in the cross examination of several witnesses by the Intervenor. Dr. Boore was of the opinion that the imminent publication of the paper in BSSA would make Open File Report 81-365 obsolete, (Boore, Tr. 4755) although he characterized most of the revisions (differences) as "cosmetic." (Boore, Tr. 6543) Possible exceptions to that statement are Dr. Boore's statements (Tr. 4754) that the revision predicts a mean value for PGA for an $M_s 7$ event about 2% lower than does the original; the mean-plus-one standard deviation would be about 4% lower; also, the equation on which regression was done was changed. (Boore, Tr. 4758) Because of the importance attached to this USGS Open File Report by Intervenor, we comment in some detail; for the sake of brevity, we refer to it and to the revision as OFR 81-365,⁶⁴ using, however, only the revised manuscript.

28. This paper reports the results of a regression analysis of data from earthquakes that have occurred in western North America. The equation to which the data were fitted has a magnitude-independent shape because it requires fewer parameters. (Boore, Tr. 6544) In translation, the equation to which the data were regressed did not allow for saturation of PGA with distance in the near field.

29. In the following discussion, the Board adopts, as edited and either in whole or in part, Staff's Proposed Findings 163-165 and Applicants' Proposed Findings 239, 241-243 and 245 pertaining to OFR 81-365.

30. The following points have been identified as significant criteria for evaluating regression analysis studies: (1) the data base should include information from earthquakes in the distance and magnitude range of interest; (2) the functional form assumed for the regression should not be biased or constrained; (3) all other things being equal, the regression with the lowest standard error is preferable. (Brune, Tr. 4461-65) In the regression analyses for San Onofre, values of PGA below 2% g are irrelevant. (S. Smith, Tr. 3263) (AF 239)

31. Included in the assumptions used in OFR 81-365 are: (1) the measure of source strength is moment magnitude. This new magnitude scale was originally developed to reflect the energy release of truly great earthquakes (greater than magnitude 8); (2) the shape of the attenuation curve (decrease of peak amplitude with distance) is magnitude independent; within the range of data ($5.0 \leq M \leq 7.7$ for peak accelerations and

⁶⁴ The revised manuscript was admitted into evidence as Intervenor Exhibit 28. The Open File Report was not admitted.

5.3 \leq M \leq 7.4 for peak velocity) it is assumed that the relative rate of peak attenuation with distance is the same for all magnitudes; (3) within the range of data it is also assumed that there is no saturation with magnitude at close distances to the fault; there is a simple log-linear relationship between peak acceleration (or peak velocity) and magnitude at all distances; this assumes, for example, that the relative proportional increase in peak acceleration at a distance of 5 km is the same when magnitude is increased by 0.5 units regardless of whether one is considering M 5.0 or M 7.0. (Reiter, supplemental testimony at 6) (SF 163)

32. It is Staff's position that this report should not be used to assess the adequacy of the design ground motion for San Onofre because the authors themselves indicate that their results are not necessarily applicable to near field sites like San Onofre. The authors state "For distances less than 40 km from earthquakes with M greater than 6.6 the prediction equations are not constrained by data, and the results should be treated with caution." (I. Ex. 28 at 17) (SF 165) In Mr. Wight's study discussed above, the data base was restricted to recordings 50 km or less from the fault rupture; Dr. Boore included data recorded as far away as 200 km. This resulted in inclusion of accelerations as low as 0.2g, which were excluded as irrelevant to San Onofre by Mr. Wight.

33. Applicants argue in a similar vein that the statistical analyses presented in this publication are irrelevant to San Onofre because the USGS study is controlled by recordings at large distances from the rupture rather than by near-field data; because the model assumptions do not allow for magnitude saturation, i.e., it is assumed that the attenuation curves for all earthquakes have the same shape; and because the weighting procedures used result in minimizing the influence of the relatively few recordings at near distances so that the analyses are controlled by low accelerations at large distances. (S. Smith, written testimony, Contention 1, at 4-6) (AF 241)

34. Testing the model of this paper with raw data shows that the model fails to predict the data at close distances for magnitudes near 6.5 (S. Smith, Tr. 3271) These inconsistencies include an 84th percentile that essentially envelopes all the data for magnitudes near 6.5. For magnitude 5, the median of the computed attenuation relationship falls below all the data. Therefore extrapolations to larger magnitudes probably overestimate PGA, making the predicted PGA values in the near field not useful for San Onofre. (Idriss, Tr. 1738; McNeill, Tr. 4023) (AF 243)

35. Using Equation 1 of the Boore and Joyner paper, the mean and 84th percentile PGA values for a magnitude 7 earthquake at a distance of

8 km are 0.46 and 0.83g, respectively, (Boore, Tr. 6559) Dr. Boore suggests reducing these values by a factor of 1.13 for comparison with Campbell's results,⁶⁵ (Boore, Tr. 6560) by which they become 0.41 and 0.73g, respectively. For a magnitude 7.5 earthquake at 8 km, Dr. Boore predicts a mean and 84th percentile of 0.54 and 0.98g, respectively, also reduced by 1.13 for comparability. (Boore, Tr. 6613) When Boore and Joyner exclude from their analysis data beyond 50 km (as recommended by S. Smith, Tr. 3263), the mean and 84th percentile values for PGA become 0.31 and 0.57, for M 7 at 8 km. (Boore, Tr. 6609) (AF 245)

36. For statistical analyses, the model should be selected that reflects the known physics of the process and whose results are chiefly controlled by the data rather than by assumptions in the model. The model of OFR 81-365 is not the most appropriate one for near-field accelerations of a large earthquake, as the authors themselves appear to concede. In any event, in view of the results in the preceding paragraph, application of the Boore and Joyner model to San Onofre does not produce results significantly at variance with the design spectrum developed for use there. (AF 242)

5. Theoretical Modeling.

37. Computer modeling of the physical processes of earthquakes is a relatively recent development and was used in this case as an independent (of empirical methods) approach to judging the adequacy of the seismic design spectrum. This method attempts to correlate observed earthquake phenomena with their possible physical causes through mathematical descriptions and computer simulations. (Frazier, Tr. 6395) Dr. Gerald A. Frazier discussed the development and refinements of his models and presented the results of their application to the San Onofre site. The Board combines and adopts the Proposed Findings of Staff (#131-153) and of Applicants (#251-261) in the following findings, as indicated.

(a). Method.

38. The great potential of theoretical models for predicting strong ground motions is that extrapolations to geometric circumstances or site

⁶⁵ Dr. Kenneth W. Campbell appeared as a rebuttal witness for Applicants. He had performed regression analyses comparable to those of Dr. Boore, also not for the purposes of this proceeding, and testified with a critique of the applicability of Dr. Boore's results to San Onofre. (Tr. beginning at 6749)

conditions for which little data exist can be made. (Frazier, Tr. 3327-28, 3538; Brune, written testimony, pp. 38, 43) The earthquake model should be viewed as a highly sophisticated method for extrapolating site-specific ground motions from recorded past earthquakes. Because of the degree of sophistication that includes rupture physics and wave mechanics, fewer data are needed to make reliable extrapolations than from conventional methods. (Frazier, Tr. 3327-28; A. Ex. 22, pp. 1-1, 1-2) The modeling studies performed for San Onofre complement empirical studies performed by Mr. Wight and Dr. Idriss. (Frazier, Tr. 6395-96) (AF 251) The basic objective of the modeling studies has been to predict ground motions at the San Onofre site that would result from a large earthquake hypothesized to occur along the OZD by modeling the physical process of previous earthquakes. (Frazier, written testimony, p. 4; Tr. 6395) (AF 252, SF 131)

39. In the initial stage of model development, computer methods were developed for simulating earthquake rupture and wave propagation in order to synthetically produce ground shaking over the frequency range 0-20 Hz. Next, strong motion recordings of past earthquakes were used in conjunction with earthquake physics to calibrate rupture parameters in the computer model. The calibrated model was then tested for simulating ground motions for additional earthquakes, and the resulting model was then used to predict motions at the San Onofre site due to several hypothesized earthquake ruptures along the OZD. (Frazier, written testimony, p. 4) (AF 253)

40. The parameters used in the modeling procedure allow characterization of a specific fault slippage along a specific rupture surface in a specific earth structure. This involves characterization of rupture kinematics, rupture extent and orientation relative to the site and geologic structure (Frazier, written testimony, pp. 6-7). All but one of the key parameters are set according to site-specific conditions or robust generic formulae common to all earthquakes (Frazier, Tr. 3316). That one parameter, the initial slip velocity V_0 , has been calibrated from near-field recordings of earthquakes. The considerable effort that went into the assignment of values for this parameter has been described in detail. (Frazier, written testimony at 8; A. Ex. 22; Tr. 3328, 3350-52) A value for V_0 of 800 cm/sec ($\pm 20\%$) was determined independently for all earthquakes modeled to date, including the 1940 Imperial Valley, 1966 Parkfield, 1933 Long Beach, 1971 San Fernando, and 1979 Imperial Valley earthquakes. (Frazier, written testimony at 8, 9; Tr. 3357, 6419) (AF 254)

41. In the model, the initial slip velocity characterizes the violence or intensity of the fracture process as the rock initially fails (Frazier, Tr. 3354) and therefore controls the high frequency components of strong

ground motion such as peak acceleration. (Frazier, Tr. 3355) Dr. Frazier concludes (written testimony at 9) that, because an essentially constant value of V_0 was required to match the high frequency recordings from the above large earthquake, the production of high frequency seismic waves per square kilometer of rupture surface is independent of earthquake magnitude and static stress drop. This earthquake property he considers physically reasonable because the initial slip velocity directly relates to dynamic stress drop (the rapid change in stress at the crack tip as gouge materials undergo initial brittle fracture). (Frazier, loc. cit.) It is his opinion that the initial slip velocity is probably a constant for all earthquakes, down to magnitude zero and up to magnitude 8. (Frazier, Tr. 3357, 6419) (AF 255)

(b) Criticisms of the San Onofre Models, and Responses.

42. The modeling studies have undergone considerable review. (Frazier, Tr. 3361, 3421) Dr. Brune offered a critique in his written testimony. First, he states that the values for standard deviations in the TERA/DELTA model do not represent the kind of standard deviations expected from real data. (Brune, written testimony at 40) Focusing is one of a number of physical processes that lead to dispersion or scatter in recorded accelerations. (S. Smith, Tr. 3258) Because such phenomena are being simulated in the computer model, it is not appropriate to add such scatter to modeling results. If such effects are not treated properly in the model, they should be referred to as inaccuracy, not as statistical scatter. (Frazier, Tr. 6405, 6406) Dr. Frazier notes further that a more appropriate way to compare the scatter in modeling results with that in recorded data is by comparing the range obtained for San Onofre from modeling various offshore rupture configurations; this scatter varies over about a factor of two, which is less than we see in real earthquakes. (Frazier, Tr. 6407) (AF 256)

43. Second, Dr. Brune states that the attenuation parameter Q has not been adequately investigated. (Brune, op. cit. at 41) Dr. Frazier responded that uncertainties in Q do not significantly influence San Onofre predictions and therefore do not relate to the reliability of the model predictions. He does not know what the value of Q should be for this site, but considers it an interesting research problem. He expects that, were he to double the value of Q in the present model and recalibrate against data, the predicted motions at San Onofre would decrease a little from their present values. (Frazier, Tr. 6400, 6408, 3379-80) Dr. Luco, who had also suggested doubling Q , did not disagree with Dr. Frazier's expectation of the possible result. (Luco, Tr. 5049) Dr. Frazier noted that both Drs. Luco and Brune referred to the modeling studies for their appraisal of this

parameter. (Frazier, Tr. 6400; Luco, Tr. 5046) Dr. Brune notes that he has not completed any independent studies of the parameter Q. (Brune, Tr. 4422) (AF 257)

44. Third, Dr. Brune states that it is difficult to infer what the effective value for dynamic stress drop is. (Brune, written testimony at 41) In his rebuttal testimony, Dr. Frazier presented a detailed discussion of earthquake stresses, stress drops and the relations among them and initial slip velocity. (Frazier, Tr. 6408-20) Dr. Frazier contends that effective stress drop is a difficult problem, of theoretical interest only, and inappropriate in attempting to deal with real data because of its non-physical implications. (Frazier, Tr. 6410) He considers dynamic stress drop to have a one-to-one relationship with initial slip velocity, V_0 , which is a parameter in his model. He has attempted to estimate dynamic stress drop from the initial slip velocity and gets about 500 bars, to which he attaches only order of magnitude accuracy. (Frazier, Tr. 6419) Values of the initial slip velocity are established empirically from strong motion recordings in southern California. (Frazier, Tr. 3356-57, 6419) Considerable evidence indicates that PGAs are not directly related to conventional (static) stress drop. (Frazier, Tr. 6418, 3420, 3552-53) (AF 258)

45. Fourth, Dr. Brune, referencing Dr. Luco, states that the TERA/DELTA model does not adequately predict the accelerations observed in the IV-79 earthquake at stations a few kilometers from the fault, being too low by approximately a factor of two. (Brune, op. cit. at 42) Dr. Brune stated that he did not independently make this assessment. (Brune, Tr. 4425) He then stated that the results presented in Dr. Frazier's testimony are not low by a factor of two. (Brune, Tr. 4426) Dr. Frazier's testimony with respect to actual comparisons between computed and recorded accelerations for IV-79 indicate good agreement for distances near 8 km, which are of primary interest for San Onofre. (Frazier, written testimony, Contention 1, at 23; Tr. 3377, 3607, 3370) (AF 259-260)

46. Regarding uncertainties in the physics of earthquakes, Dr. Frazier notes that the relevant question is "Has the modeling been done in a consistent manner?" Each time the model has been updated or improved and new results calculated for San Onofre, the resulting values are all comparable. The reason the values are similar is not because all of the physics in the model is 100% correct; rather, the results are similar because the modeling matches real data at distances appropriate for San Onofre. (Frazier, Tr. 3478, 3451) Dr. Frazier concedes that there are gaps in the knowledge of earthquake phenomena and that some comments have led to improvements in the model while others, although interesting, are primarily of scientific interest. He considers the model adequate for the practical purposes intended. (Frazier, Tr. 6399, 6403, 6407, 3378, 3450, 3467, 3476-78) (AF 261)

47. The Board also heard testimony from Dr. J. Enrique Luco, who appeared as a Board witness, concerning his review of the Applicants' modeling studies. Dr. Luco has served as a consultant to the Staff in its review of the TERA/DELTA modeling. (Luco, Tr. 4977) Intervenors' Exhibits 19, 20, and 21 relate to his testimony. (SF 149)

48. While Dr. Luco expressed his views concerning the appropriateness of certain of the parameters in the study, he was emphatic in his position that he was "not recommending a particular value of g for design." (Luco, Tr. 5010) It is also worthy of note that Dr. Luco's recommendation of a value of 0.8 g (Luco, Tr. 5007-08, 5010) is for purposes of defining a free field or instrumental spectrum. (Luco, Tr. 5014) (SF 150)

49. Dr. Luco acknowledged that it is possible to reduce the design spectrum from the free-field spectrum, but he objected to doing it at the beginning of an analysis. (Luco, Tr. 5021-22) (SF 152)

50. Dr. Luco was involved in the origin and validation of the TERA/DELTA computer program (Luco, Tr. 5038) and continues his work in this area through development of his method of study of earthquake phenomena via computer analysis (Luco, Tr. 5038 et seq.). He maintained that his view of the TERA/DELTA modeling has changed little over the time of his letters of comment on it (I. Exs. 19, 20, and 21; Luco, Tr. 5028, 5043) and expressed preference for his approach. (Luco, Tr. 5046) Nevertheless, Dr. Luco believes that the "general approach" is "of high value in estimating the strong motion characteristics at a site." (I. Ex. 19 at 1; Luco, Tr. 5094) Thus, for comparative purposes, the modeling approach serves a useful adjunct to empirical studies. (See SER §2.5.2.4.5) (SF 153)

(c) San Onofre Predictions.

51. A suite of postulated earthquakes was examined in the modeling approach to isolate particular rupture configurations that produce the strongest ground shaking at San Onofre. The various conditions that were compared included different fault locations, rupture directions, fault length, hypocentral depth, depth to the fault bottom, and depth to the fault top. (Frazier, written testimony at 16-17; A. Ex. 22) (AF 262)

52. The worst case fracture represented an M_S7 with rupture orientation so as to maximize ground motion at the site. The results indicate that the design spectrum is conservative in that it exceeds the predicted instrumental spectrum at all periods of interest using 2% damping. (Frazier, written testimony at 14-16, Figs. GAF-A through GAF-D) (AF 264)

(d) Board Findings.

53. Because earthquake modeling of the kind done for San Onofre is a relatively new and controversial technique, this board is not prepared to endorse it unequivocally. Until there is greater experience and refinement of these techniques, we think it would not be prudent (although perhaps possible under a "preponderance of the evidence" approach) for a licensing board to make definitive determinations about some of the very technical questions that have been raised by the critics — unless such determinations are necessary to decide the case, a situation that does not obtain here.

54. In light of these considerations, we make no specific findings, for example, about the proper value of "Q" or the implications of dynamic stress drop for modeling studies. Only further research will produce the "truth" about these matters. But we can reach these general conclusions. First, it is particularly significant that the results of the modeling studies were validated against near-field recordings of five important California earthquakes in the distance range relevant for San Onofre. (Frazier, written testimony, p. 17). In addition, we were impressed with the level and intensity of intellectual effort devoted to these studies by Dr. Frazier and his colleagues. Moreover, although critics raised some interesting questions, these appear to relate in the main to refinements in methods, not fundamental flaws. As the Staff points out, the results of the Applicants' modeling studies support the conservatism both of the SSE and the empirically derived design spectrum. (SER §2.5.2.4.2) We therefore believe we can take these studies into account as bolstering our determinations about the adequacy of the San Onofre design spectrum.

55. The Board reiterates its concurrence with the Staff that the most appropriate way to arrive at an estimate on strong ground motion is through a conservative comparison of the results of different methods of determination. The table below summarizes the PGA results reached for San Onofre by the different methods discussed above. We observe that all estimates lie appreciably below the 0.67g anchor point to which San Onofre was designed, except for the Boore estimates. When the Boore estimates are adjusted appropriately for distance, they are also compatible with the anchor point.

**Estimated PGA at San Onofre
for an M_s 7 Event on the OZD**

Investigator	PGA for Instrumental Spectrum (g)	
	Mean	84th Percentile
Wight	0.33	0.52
Idriss	^a	0.63
Boore	0.46 ^b	0.83 ^b
Frazier	0.31 ^c	^a

^a We do not find this value in the record.

^b These values result from inclusion of recordings at distances greater than 50 km. When recordings beyond 50 km are excluded, the resulting values are 0.31 and 0.57.

^c See A. Ex. 21, p. 5-11.

6. Development of the Design Spectrum.

56. Applicants' witness Dr. Robert McNeill was directly responsible for and actively involved during 1971 and 1972 in calculation of the design spectrum for San Onofre Units 2 and 3. Much of Dr. McNeill's testimony was directed to bridging the gap between the seismologist who deals with an instrumental free field response spectrum and the designer, who needs a design spectrum. (McNeill, written testimony at 18; Tr. 2748)⁶⁶ Dr. McNeill's testimony (at p. 6) includes a lucid discussion of the technical terms in this area.

57. "The shape of the [design] spectrum was derived by mathematically propagating virtually all of the strong motion recordings then available through the profile of the San Mateo Formation. [T]he resulting instrumental spectra at the site ground surface [were then calculated and enveloped]. For this purpose, the dynamic properties of the San Mateo Formation were determined by both field and laboratory tests." (McNeill, written testimony, p. 18.)

⁶⁶ The Intervenors objected to the admission of the testimony of Dr. McNeill and Mr. Lawrence Wight, and also to portions of the testimony of Dr. Idriss on the grounds that it is not within Contention 4. They argued that that contention is concerned only with the geology and seismology of the site, and that it does not extend beyond determination of free field accelerations to the next step in the process — construction of design spectra for the facility. The Board ruled that Contention 4 does extend to the testimony in question insofar as it concerns design spectra considerations. The contention expressly refers to the "seismic design basis" of the facility, which plainly includes design spectra. Apart from that, some of the testimony in question, particularly that of L. Wight, is concerned primarily with free field accelerations, not design spectra. See Tr. 1589-1612, 1696-98.

58. "The instrumental spectrum shape was anchored to a zero period acceleration [ZPA] of 0.5g At that time (1972), the maximum magnitude on the OZD had not been determined, but it was recognized that design for a very large, nearby earthquake would be conservatively appropriate. For that reason, and in consideration of the state of the art of predicting ground motions and structural response at that time, the following modifications were made to the 0.5g site instrumental spectrum to add extra conservatism: (i) the ZPA was increased to 0.67g, and the entire instrumental spectrum was scaled up to that value; (ii) the acceleration amplification ratio was increased by about ten percent; (iii) the short-period turning point was decreased from 0.05 second to 0.033 second." *Id.*, pp. 18, 19.

59. Dr. McNeill described the factors entering into the consideration of soil-structure interaction and the manner in which structures of various size and situation respond to vibrations. (McNeill, written testimony, pp. 13-15; Figs. RLM-H and RLM-I) For example, he pointed out that the dimensions of large structures are larger than the wave lengths of the short-period waves and, therefore, do not respond fully to them. An embedded structure responds less than a surface instrument because the motions at depth may be less than those at the surface. All these considerations serve to lower the short-period end of the design spectrum. (McNeill, loc. cit.)

60. Probably the greatest conservatism lies in the use of this instrumental spectrum directly for design. No allowances were made for wave-passage, incoherence, mass, depth-of-embedment or other effects which cause the motions governing structural response to be less than those recorded by free-field instruments. Furthermore, no allowance was made for the extra strengths which are provided for in the structural design. (McNeill, written testimony, pp. 18-19) The design form of the design spectrum is shown in Fig. RLM-L of Dr. McNeill's written testimony.⁶⁷

61. There is no significance for design in a single observation that exceeds the 84th percentile. There is intrinsic scatter in the data that must be taken into account by looking at the dispersion. (Idriss, Tr. 1747) Some values of PGA will exceed the instrumental response spectrum (Brune, Tr. 4230).

62. The Board concurs with Applicants and Staff that significant conservatisms were introduced at each stage of the development of the design spectrum. The Board is impressed with the evidence of the attention

⁶⁷ It was necessary to derive an equivalent instrumental spectrum for the plants since Dr. McNeill had used the conventional instrumental free-field spectrum as the design spectrum. This derived instrumental spectrum is shown in Fig. RLM-P of Dr. McNeill's written testimony.

to detail and the conservatism manifest in the establishment of the design basis for San Onofre Units 2 and 3. We note the testimony of Staff witness Dr. Reiter to the effect that he considers the facility, one of at least 30 that he has reviewed (Reiter, Tr. 5585), to be probably the most conservatively designed. (Reiter, Tr. 5597-98)

7. Relationship Between Vertical and Horizontal Accelerations.

63. Since acceleration is a vector, it can be resolved into three mutually perpendicular components. In the context of this hearing, most of the emphasis was placed on the horizontal components, in almost all cases the larger one. However, the vertical component was not ignored.

64. A view based on observations and held by many seismologists apparently for some time is that the vertical component of strong motion would be $\frac{2}{3}$ the horizontal component. (Reiter, Tr. 5860) It is not clear from the record whether this ratio is intended to apply to the larger horizontal component or to some sort of an average of the two; however, in light of our findings below, this is of little relevance for our purpose.

65. Analysis of the data from large earthquakes since 1973 has shown several instances of nonconformance with this assumption, notably in the 1979 Imperial Valley and in the 1980 Mammoth earthquakes in which some stations showed the vertical component equal to or larger than the horizontal components. (See, for example, Anderson at Tr. 4648; Frazier, testimony, Contention 1 at 15 ff.) Because the design spectrum for San Onofre is anchored at 0.44g vertical acceleration ($\frac{2}{3}$ of the PGA of 0.67g), Dr. Brune feels that "we cannot be sure of the degree of conservatism involved in the vertical acceleration of 0.44g" (Brune, testimony at 63); he views these recordings of the vertical component greater than $\frac{2}{3}$ the horizontal as further evidence of our lack of understanding of earthquake phenomena. (Brune, op. cit., at 62) Although Dr. Brune expressed concern about exceeding the $\frac{2}{3}$ ratio, he did not attach any specific significance to such an exceedance from the standpoint of the design of the plants. (Brune, Tr. 4224-25, 4228-29, 4238) These areas, he acknowledged, are beyond his expertise. (Brune, Tr. 4224, 4231)

66. Several explanations have been offered of these high vertical recordings (Brune, *ibid.*; Frazier,⁶⁸ testimony Contention 1, at 15 to 21; Anderson, Tr. 4649) but the matter remains speculative at this time. Of greater present importance is the question of their possible impact on the adequacy of the design basis of San Onofre. Dr. McNeill, who had derived

⁶⁸ Dr. Frazier considers the "large vertical acceleration recorded at Station 6 (1.74g later corrected to 1.52g) during the 1979 Imperial Valley earthquake . . . an enigma" and offers extensive comment on it. (Testimony, Contention 1 at 19 ff.)

the spectra used for design, testified that the $\frac{2}{3}$ ratio has no significance for him but that the values of acceleration do. (McNeill, Tr. 4024) He discussed the impact of events since 1973 on the design spectrum for San Onofre by comparing their spectra. Referring to his written testimony for Contention 4, Figs. RLM-Q and RLM-R, it is apparent that the design spectra, horizontal and vertical, lie above the IV-79 spectra at all periods for relevant distances. (McNeill, Tr. 4009)

67. Further, the design of San Onofre Units 2 and 3 assumes conservatively that the significant ground motion from all components occurs at the same time; the assumed duration of this motion, including repetition of high peaks of acceleration, is much longer than that recorded at IV-79 (80 sec vs. less than 15 sec). (SER, §2.5.2.4.6) The duration of strong motion is important because of the damage it can do to structures.⁶⁹ Dr. Reiter observed that the high vertical accelerations recorded during IV-79 did not correlate with damage and that the high-frequency vertical spikes, which did not occur at the same time as the maximum horizontal motions, seem to be of little importance. (Reiter, Tr. 5881)

68. In summary, the Board feels no concern over the fact that the traditionally expected $\frac{2}{3}$ ratio between vertical and horizontal accelerations has been exceeded in some recent recordings; the adequacy of the design criteria for the plants has not been affected.

8. Saturation of Peak Ground Acceleration.

69. The concept of "saturation" of peak ground accelerations in the area near the fault rupture surface, the so-called "near-field," is controversial among seismologists. In the case of moderate earthquakes of magnitude ranging from, say, M_s 5 to 6, there will be a roughly proportional increase in peak ground acceleration ("PGA") accompanying increasing magnitude. However, if the Applicants' thesis is correct, that proportional increase in PGA will diminish — i.e., the curve plotting PGAs will begin to "flatten out" — above magnitude 6. And above M_s 6.5, further increases in magnitude will not be accompanied by any significant increases in PGA — i.e., PGA becomes "independent" of magnitude in the near field area close to the fault. As described by Dr. Frazier, one of the Applicants' witnesses on this point, when saturation occurs at the larger earthquake

⁶⁹ Dr. McNeill described the possible importance of duration at Tr. 4012-16. In response to a Board question, Dr. McNeill stated that at the time he derived the spectra for these plants there was no specification of M_s 7 at 8 km, and the intent was to design conservatively. Events since the design was established indicate, in his opinion, that the spectra, the time history, and the duration of the time history are extreme; he further stated that, if he were to do the design again, with the many more records for guidance, the design constraints would be much less severe than they are. (McNeill, Tr. 4017)

level, "the sensitivity of peak ground acceleration (PGA) on earthquake magnitude diminishes with increasing magnitude and with decreasing distance." (Frazier, written testimony, pp.18-21).

70. The saturation concept, if established for the anticipated PGA in this case, would buttress the adequacy of the San Onofre design basis. It would mean, in effect, that a PGA significantly higher than that to be expected from an $M_S6.5$ earthquake would not result, even from earthquakes of M_S7 or $M_S7.5$. On the other hand, it would not mean that earthquakes of such higher magnitudes might not cause greater damage. For example, the higher magnitude earthquakes can cause ground motion of much longer duration, even though PGA measurements may be about the same. Nevertheless, proof of the saturation concept here would add a significant element of conservatism to the Applicants' case. S. Smith, Tr. 3285-87.

71. There is general agreement that measurements of some waves caused by earthquakes saturate at certain magnitude levels. Thus, the surface wave magnitude method of measurement is based on relatively long-period 20 second surface waves. According to Dr. Frazier, these waves saturate at about $M_S8.3$. M_L and body wave measurements are based on shorter waves with a period of about one second. Both of these measurements saturate at values equivalent to about M_S7 , so that earthquakes larger than M_S7 nevertheless do not register above 7 on these scales. Frazier, written testimony, p. 18. The Intervenors generally accept these saturation phenomena and the magnitude levels at which they tend to occur. Brune, Tr. 4995-4500.

72. The Intervenors' chief witness of this point, Dr. Brune, expressed his general agreement with the proposition that PGA would saturate, but only "at some high [and unspecified] magnitude" on the M_S scale. Tr. 4482. Furthermore, the Intervenors' findings of fact refer to the possibility of PGA increasing up to $M_S7.5$. IF 126. Thus, the crux of the disagreement between the Applicants and Intervenors is whether saturation will occur at some point between $M_S6.5$ and 7.5.⁷⁰

73. Having established these parameters of disagreement, we look to the proof adduced by the Applicants and the Intervenors. The Staff offered no proof and proposed no findings on the saturation phenomenon.

74. In their proposed findings of fact, the Applicants rely primarily on certain testimony of Drs. Smith and Frazier. Dr. Smith testified that "the data clearly shows that above magnitude six and a half, the peak ground acceleration is essentially independent of magnitude." Tr. 3240. In support

⁷⁰ Consideration of larger earthquakes from the "saturation" perspective is not warranted because there is no substantial evidence in the record indicating the possibility of such an earthquake on the OZD.

of his position, he referred to data from five specific earthquakes, to a recently published paper, and to the Applicants' Exhibit 11. *Id.* He asserted that the most recent paper published by Hanks and McGuire on strong ground motion supported his position that PGA saturates at $M_s6.5$. Tr. 3242-43. However, this paper, entitled "The Character of High-Frequency Strong Ground Motion," was not introduced into evidence. Dr. Smith had not carried out any independent research, beyond reviewing data over the years. Tr. 3245.

75. Dr. Frazier also endorsed the saturation phenomenon, but from a theoretical, rather than an empirical, perspective. His reasoning proceeded from the demonstrated saturation of 20 second and one second waves at $M_s8.3$ and 7, respectively, to the hypothesis that waves around 5 H_z (0.2 second) "would be expected to" or "should" saturate at about $M_s6.5$. Frazier, written testimony, pp. 18-19. Seemingly implying some disagreement with Dr. Smith, Dr. Frazier indicated that the saturation of high-frequency waves is not well documented because of the difficulty of measuring such waves at long distances.

76. The Intervenor's rely upon Drs. Brune and Boore for the proposition that PGA does not saturate with magnitude, or at least that it has not been shown to saturate in the range of $M_s6.5$ to 7.5. Dr. Brune reviews aspects of some current literature on saturation and concludes that "the question of magnitude saturation cannot be solved by debate over the present data set, but must await accumulation of more data." Brune, written testimony, p. 60. Dr. Brune's arguments rest largely upon the recent Hanks and McGuire article, the same article in which Dr. Smith found support for his quite different views on saturation. Dr. Brune also relied on a recent unpublished paper by C.H. Scholz. Neither of these articles is in evidence. Since the data and assumptions underlying the conclusions of these articles are unavailable to us, we cannot attribute evidentiary weight to the views Dr. Brune bases solely upon them, other than to acknowledge that they may raise interesting questions on this subject. It is Dr. Brune's independent view that we do not have enough data to establish whether near field PGA saturation occurs with large earthquakes.

77. Dr. Boore of the U.S. Geological Survey testified concerning saturation largely on the basis of the most recent revision of an article he wrote with Dr. Joyner which was recently submitted for publication to the Bulletin of the Seismological Society of America. This article is in evidence as Intervenor's Ex. 28. Although this study did not focus primarily on the question of near field saturation, the authors did note that their data showed "no tendency for . . . peak acceleration . . . to saturate with magnitude ." They further noted that —

Although it might be argued that peak acceleration should saturate for the same reason that the body-wave magnitude scale saturates, we are not aware of any careful analysis supporting this argument. We consider the question open. I. Ex. 28, p. 17.

Dr. Boore testified that he and Joyner had chosen to use a regression curve having the fewest number of parameters; and since their data did not demonstrate the saturation phenomenon, they had used a magnitude-independent curve. He stated that he was "not really aware" of a saturation level associated with PGA, but indicated his belief that saturation might be found with great earthquakes of magnitudes M_w 8 to 9. Tr. 6588-96.

78. If the foregoing fully described the record on saturation, we might conclude that the evidence is in equipoise. We would have about equal and not very strong cases for and against the phenomenon, coincidentally supported by four exceptionally well-qualified experts, two on each side. In that event, the issue would go to the Intervenors, because of the Applicants' failure to prevail by a preponderance of the evidence. However, we believe that the Applicants' Exhibit 11, not cited to us for the saturation phenomenon, tilts the scales in the Applicants' favor to a limited extent.

79. We have earlier made favorable findings concerning Applicants' Exhibit 11, sponsored by Lawrence Wight. See ¶¶ 12-17, above. That study included conclusions that PGA saturates both with increasing magnitude and decreasing distance from the fault rupture surface. More importantly, the study includes a description of the underlying data and how it was selected and analyzed. The results from a saturation perspective are clearly evident in Figures 4-1 and 4-4. For example, Figure 4-2 shows a marked bending downward of the median curves, reflecting a slower increase in PGA with decreasing distance from the fault. Similarly, Figure 4-4, which normalizes data to 8 km, shows the median curve of PGA flattening with increasing magnitude. The Wight results are also substantiated by the testimony of Dr. Frazier on the 1979 Imperial Valley earthquake, which we note although it was not cited to us for the saturation phenomenon. Frazier, written testimony on contention 1, p. 13, and Figure GAF-H. See also written testimony of I.M. Idriss, p. 12 and A. Ex. 18.

80. The Wight study is very helpful, but it does not carry the day entirely for the Applicants. First, as has been frequently noted, more near-field data from large earthquakes are needed to test the saturation hypothesis fully. Beyond that, the Wight data does not provide a clear demonstration that saturation is virtually complete at M_s 6.5, that increases in magnitude beyond that will not be accompanied by significant PGA increases. The Wight tables indicate that saturation *begins* between M_s 6

and 6.5, and that it increases through M_S7 . However, the tables also suggest that smaller but significant PGA increases could occur above M_S7 , particularly considering the lack of data at such magnitudes.

81. We conclude that PGA probably does begin to saturate to some extent within 10 km of the fault between M_S6 and 6.5, and that saturation probably continues thereafter with increasing magnitude and decreasing distance from the fault rupture surface. The record contains no sufficient basis for concluding when or whether saturation becomes complete. This qualified finding lends some slight support to the adequacy of the San Onofre design. However, given the meager and rather confused record on saturation, we do not ascribe substantial significance to the phenomenon.⁷¹

9. Effects of Focusing on Peak Ground Acceleration.

82. As stated by Dr. Brune:

Focusing of energy in the direction of source propagation is a phenomenon that has been known and observed in nature for many years. In seismology, the effect has been termed directivity and has been observed for many earthquakes, . . . most recently in the Livermore earthquake . . . the Santa Barbara earthquake . . . and the Coyote Lake earthquake. Written testimony, p. 32.

Earthquake focusing results from time compression of signals, similar to the familiar Doppler effect one hears as a train or helicopter passes. Dr. Frazier provides the following illustrative example:

Focusing for earthquakes can be understood by considering a unidirectional fracture that ruptures due north and emits seismic waves for a duration of 10 seconds. Because of the approaching rupture, an observer in the near field and north of the source experiences strong shaking for a duration less than 10 seconds, say 6 seconds. The fact that 10-seconds-worth of seismic energy arrives within 6 seconds tends to increase the amplitudes of ground motion in the direction of rupture focusing. Conversely, an observer in the near field, south of the source, experiences strong ground shaking for a duration longer than 10 seconds which tends to decrease the amplitudes of motion in the direction of rupture defocusing.

⁷¹ Apparently the record in the *Diablo Canyon* case contained more persuasive proof of near field PGA saturation. The Appeal Board there strongly endorsed the concept. See *Pacific Gas and Electric Co. (Diablo Canyon Plant)*, ALAB-644, 13 NRC 903, 929-934 (1981). If saturation had turned out to be a pivotal issue in this case, we might have sought further evidence on the question. Since the result is not affected by this factor, there was no occasion to pursue it further.

83. The phenomena of focusing and saturation are opposites from a safety standpoint. That is, saturation would diminish the PGA one would otherwise expect and the consequent hazard to a facility; by contrast, focusing would result in a higher PGA toward a facility and would increase the hazard.

84. There was no dispute among the witnesses that focusing is a real, observed phenomenon. The dispute centered on how much higher PGAs might be expected to result from focusing.

85. The Applicants' witnesses, Drs. Smith and Frazier, took the position that, other things being equal, the maximum spread between the low (or "defocused") PGA and the focused PGA would be approximately a factor of 2, and that the spread between the median PGA and focused PGA would be approximately a factor of 1.5. For example, if the median PGA were .3, the focused PGA might be about .45, and the defocused PGA would be about .22. These figures are borne out by data derived from the best instrumented earthquakes for testing the focusing phenomenon — Parkfield, Livermore, Santa Barbara and Coyote Lake. Dr. Brune, the chief witness for the Intervenor, agreed with the results derived by the Applicants from these earthquakes. Tr. 3255-58; Frazier, written testimony, pp. 12-13; Tr. 4367.

86. In addition to these data, Dr. Frazier testified that his modeling study incorporated focusing effects. He noted that the model tended to overemphasize focusing effects of PGA due to localized irregularities associated with actual earthquakes. As noted previously, the PGAs predicted by his study for San Onofre are well within present design parameters. Written testimony, p. 10.

87. Dr. Brune testified that focusing can lead to PGAs in the direction of rupture "several times higher" than in the opposite direction. He was reluctant to quantify that estimate further, but suggested that about 5 times higher was a possibility. Tr. 4365. He did not suggest any theoretical reason why this would prove to be the case. Dr. Brune pointed out, however, that there is no case of a well-instrumented large earthquake (M_s near 7) that might clearly illustrate the maximum potential effect of focusing. *Id.*

88. The Intervenor's cite a recent article (Intervenor's Ex. 17) by their witness, Dr. Boore, which included some data analysis from two 1980 earthquakes in the Livermore Valley. In the article, Dr. Boore states that the results of their analysis "are most easily interpreted as the result of directivity" (focusing), but he does not state how much directivity is indicated. I. Ex. 17 at p. 2295.

89. In their proposed finding 111, the Intervenor's quote Dr. Boore in his direct examination, where he refers to certain comparative data in the article and to a "factor of ten" change in that data. The Intervenor's go on

to state that "Dr. Boore's best interpretation of the data from the Livermore earthquake is that directivity affects the peak accelerations by a factor of 10." This is a serious misstatement of the record. Dr. Boore did not say anything of the sort. On a page of the transcript not cited by the Interveners, their Counsel specifically asked Dr. Boore —

Does the directivity observed in the Livermore earthquake indicate a factor of up to ten increased ground accelerations in the direction of rupture?

Dr. Boore answered —

Not necessarily . . . The data are available, and I don't recall — I don't think they showed that much change. This kind of a factor of ten increase is — if you had two events and they were propagating in different directions, then the actual variation of acceleration in the event can be on the order of the square root of ten. Tr. 4749-51.

In concluding on this subject, Dr. Boore would only say that the data from the Livermore earthquakes showed directivity in that particular earthquake, resisting promptings from counsel to make a broader statement. Tr. 4765-66. Other testimony from Drs. Smith and Frazier places this Livermore data in a clearer perspective and indicates that it is not seriously inconsistent with other available focusing data. Tr. 3255-58; 3556-58. Dr. Brune also appeared to question whether the Boore article demonstrated a high degree of focusing at Livermore. Tr. 4367.

90. Intervenor witness Dr. Anderson testified concerning certain PGA readings he had obtained from the 1980 Mammoth Lake M_s 6.2 earthquake. At three stations located at different points on a 10 km radius of the estimated epicenter, the readings were .72 and .55g, .27 and .35g, and .20 and .10g. He suggested that focusing was a possible explanation of the different readings, but that he had only preliminary data insufficient to make any exact determination of the cause. Tr. 4626-27.

91. The 1979 Imperial Valley M_s 6.9 earthquake generated more strong motion recordings than any other strike-slip earthquake to date. Dr. Frazier testified that these data were consistent with those previously derived for the Parkfield and Coyote Lake earthquakes, providing further evidence "on the limited effects that rupture focusing has on increasing peak accelerations." Frazier, written testimony, Contention 4, p. 13, Contention 1, p. 13. Dr. Brune conceded that the Imperial Valley earthquake had not produced a focusing phenomenon multiplying PGAs by 5. Tr. 4368. He suggested, however, that this may not have occurred "possibly because the source was not an approximate uniform rupture." Brune, written testimony, p. 33. That suggestion was not further explored.

92. An additional consideration, not explicitly developed in the record, leads us to largely discount focusing as a significant hazard in this particular case. Increased PGAs resulting from focusing are highest directly in the path of the spreading rupture. Thus, our focusing concerns would be greater if the San Onofre facility stood directly in the path of a major fault. But the OZD, the controlling structure, is oriented orthogonally to the facility, about 8 km offshore. Dr. Smith was apparently referring to a similar situation in the Santa Barbara earthquake, where Santa Barbara was "off to the side" from the fault, and higher PGAs occurred elsewhere. Tr. 3258.

93. In summary, we conclude that the focusing phenomenon is not a serious safety concern, at least in this case. All of the available evidence indicates that where focusing does occur, the resulting differences in high and low PGAs will be about a factor of 2, and that lesser differences will obtain between median and high PGAs. Moreover, there are no major active faults in the site vicinity "focused" — i.e., aimed at — the site. Furthermore, the Intervenor's concerns about focusing are based in the record on little more than its possibility and an alleged lack of sufficient data. They have failed to advance a plausible theory supporting these concerns.

94. We find, in conclusion and considering all of the factors discussed in this Section III C, that a 0.67g PGA predicated upon the occurrence of an $M_{5.7}$ earthquake on the OZD about 8 km from the site represents a conservative anchor point for the design spectrum of the San Onofre facilities.

D. Newly-discovered Geologic Features.

1. Introduction.

Contention 3 states that:

Whether the seismic design basis for SONGS 2 & 3 is inadequate to protect the public health and safety as a result of discovery subsequent to issuance of the construction permit of the following geologic features: (1) ABCD features at the site; (2) features located at Trail 6, Target Canyon, Dead Dog Canyon, Horno Canyon, and "onshore faults E & F"; (3) such other features as the parties may agree are relevant to the seismology of the SONGS site or with respect to which intervenor Friends of the Earth makes a threshold showing of relevance.

Both the Applicants and the Staff presented testimony and exhibits concerning the various features named in this contention. (J. Smith, written testimony, pp. 1-19; P. Ehlig, written testimony, pp. 1-4; A. Exs. 25-27; SER Sections 2.5.1.3, 2.5.1.6 and 2.5.1.8). One Intervenor witness (M.

Legg, written testimony, pp. 8-10) briefly addressed the ABCD features, but the Intervenor propose no findings based on that testimony and apparently do not rely on it.⁷²

2. Although the contention contemplated that the parties might agree upon, or one party might prove, the relevance of additional geological discoveries, that did not occur.⁷³

3. The proposed findings of the Applicants and the Staff on Contention 3 are basically consistent, although each party tends to rely more on its own evidence. Thus, this contention is essentially uncontested, except for a few findings proposed by the Intervenor.

2. ABCD Features.

(a) Discovery and Investigations.

4. In 1974, following issuance of the construction permits, anomalous geologic features in the San Mateo formation were discovered at the site during excavation of Units 2 and 3. These features were designated the "A and B" features by the Applicants. They are referred to variously as "joints," "shear zones" and "minor faults." The Staff requested the Ap-

⁷² Our independent review of this testimony indicates that it is not entitled to significant probative value. Its thrust — that the ABCD features are "favorably oriented" for slip in the present stress regime — was blunted by the witness' inability to say what kind of fault orientations would not be "favorably oriented." M. Legg, written testimony, pp. 8-10; Tr. 5242-5245. Furthermore, the witness conceded that he had not personally done any field study of the ABCD features. Tr. 5252.

⁷³ Early in the hearing, the Board Chairman was contacted informally by Mr. David W. Phifer, a local resident who indicated that he had significant geological information about the San Onofre area. The Board granted Mr. Phifer a specially scheduled limited appearance in which he presented his interpretations of certain geologic features as previously unknown active faults. Tr. 1418-1432. Thereafter, the Applicants conducted field investigations and lodged a report with the Board on Mr. Phifer's information, concluding that his active fault interpretations were incorrect and that his information was not significant to the seismic design of San Onofre. The Staff, on the basis of their own field investigations and review of the Applicants' report, concurred in those conclusions. Tr. 6024. The Intervenor acknowledged that they had no evidence that would justify further pursuit of Mr. Phifer's views in this case and that they did not intend to call him as a witness. Tr. 6090-6092. In these circumstances, the Board saw no reason to pursue the matter any further.

After the record was closed, Mr. Phifer submitted additional information about the San Onofre area and his geological interpretations of it, to the Commission, the President and other officials, and the media. The Applicants prepared a second report dated November 25, 1981 on features it had not previously discussed; the Staff concurred with the Applicants on December 5, 1981. Once again, we saw no basis for this Board to take any action on Mr. Phifer's information.

The Staff introduced evidence and proposed findings (SF 223-224) concerning two cracks discovered near the Cristianitos fault since construction permit issuance. Since no threshold showing was made as a predicate for considering these features, we have made no findings considering them.

plicants to perform a detailed study of these features in order to assess the possibility of ground rupture under the reactors. (SER 2.5.1.3; S. Ex. 9, p. 1; A. Ex. 25, p. 1; J. Smith, written testimony, pp. 2-3).

5. Shortly thereafter, two additional features labelled the "C and D" features were discovered and reported to the NRC Staff. The Applicants undertook an investigation of these features as well. (SER. 2.5.1.3; A. Ex. 26, pp. 1-2).

6. We adopt the Applicants' overall description of its investigations at the site, AF 350:

"The investigations of the A, B, C, and D features at the site were extensive and detailed. They included review of pertinent geologic literature, review of aerial photographs, geologic mapping at Units 1, 2 and 3 of SONGS, excavation of 19 backhoe trenches, drilling of seven borings to a depth of 25 feet, detailed logging of all backhoe trenches and pertinent excavations, microscopic and petrographic studies, theoretical analysis regarding the mechanics of their origin, detailed mapping at two areas outside the SONGS site and inspection of two other localities. The investigations involved approximately 215⁷⁴ man-days, and were reviewed on several occasions by representatives of the NRC, USGS, and ACRS. (A. Ex. 27, pp. 3-4; S. Ex. 9, pp. 2-3).

7. A and B features were found at various elevations around the site, indicating that they extend to depths of perhaps a few hundred feet into the sandstone San Mateo formation on which the site is located. Because of their good exposure in both horizontal and vertical views in and around the site, it was not necessary to investigate them to greater depths. (J. Smith, Tr. 2693-2694).

8. The Applicants also conducted extensive investigations off site, but in the nearby vicinity, for further evidence of ABCD features. The A and B features were found in several off-site areas in the San Mateo formation, demonstrating that these features are not unique to the site. The features in two of these areas were studied in detail, including the use of drilling and trenching techniques. (J. Smith, Tr. 2672-74, 2772; A. Ex. 25, pp. 4, 23; S. Ex. 9, pp. 9, 29).

9. Searches were conducted off site for additional examples of C or D features, but no additional examples were found. (A. Ex. 26, pp. 8, 13).

10. The Applicants did not perform any seismic reflection profile investigations of these on-shore ABCD features because such minor features cannot be adequately detected by that technique. Trenching, which was done extensively, is the preferred method for determining offset and age dating. (T. Cardone, Tr. 6676-78; J. Smith, Tr. 2718-20).

⁷⁴ The Applicants' exhibit states that 295 man-days were involved for investigations and report preparation. We assume that the 215 days refers only to investigations.

11. The Intervenors attempted through cross-examination to impeach the adequacy of the Applicants' investigations of the ABCD features. These efforts tended to disregard what had been done and to call for further investigations without any showing that something significant might be accomplished. The Board was impressed with the thoroughness of the Applicants' investigations, particularly as reflected in Applicants' Exhibits 25, 26, and 27, and finds that any further investigation of these features would not have been useful. (See, e.g., cross-examination by G. Barlow of J. Smith, Tr. 2714-17, 2720-23; and T. Cardone; Tr. 6677, 6713-14, 6724-26).

(b) Description of ABCD Features.

12. The San Mateo Formation of Pliocene or Mio-Pliocene age is well exposed along the sea coast and underlies the San Onofre site. The formation consists predominantly of massive, light-brown to light-gray sandstone with scattered interbeds of gravel. The sandstone forms steep canyon walls and nearly vertical cliffs along the sea coast. (S. Ex. 9, pp. 4-5). We adopt the Applicants' proposed findings 380-382, 385-392 in the following eleven paragraphs.

13. "The A and B features at the SONGS site are light gray or white, slightly resistant ridges in the tan San Mateo formation. The ridges are a fraction of an inch wide and collectively comprise a zone 1-6 inches wide, averaging about 2-4 inches." (A. Ex. 25, pp. 15-17).

14. "The A and B features are discontinuous joint-like shears that intersect in a conjugate relationship. They are nearly vertical, and linear or broadly curvilinear in plan. Type B features decrease in width and eventually disappear in the eastern half of the site, and the Type A features decrease in width or disappear in the southern part of the site." (A. Ex. 25, p. 3).

15. "The individual elements of the A and B features present a stepping or intertwined appearance that consistently indicates right- or left-lateral displacement. The absence of the intertwining and stepping arrangement of the elements where the features are observed in vertical excavations indicates that slip on the features occurred horizontally rather than vertically." (A. Ex. 25, pp. 15-16).

16. "The A and B features are straight in plan and section and they are resistant to brushing in the more easily eroded sandstone because of the slight amount of crushing and compression that occurred along them during their formation." (J. Smith, written testimony, p. 5).

17. "Under the microscope, the A and B features can best be described as a crush-breccia with a very closed framework. The cementing agent is not clay or calcite, but a weak binding of fine sand or silt-size grains." (A. Ex. 25, p. A-2).

18. "Feature C consists of a sinuous zone of thin $\frac{1}{8}$ to $\frac{1}{4}$ inch) white resistant ribs that are very similar to the A and B features." (A. Ex. 26, p. 7).

19. "The D feature consists of a sinuous pattern of hairline planar fractures containing little or no evidence of crushed grains and no evidence of compaction. It is quite different from the ABC features because of its lack of linearity and its lack of resistance to erosion by brushing. The orientation of the D feature is very similar to that of bedding in the San Mateo formation. Displacement on the D feature is in a reverse sense, with the northern part being up. Displacement ranges from as low as $\frac{1}{8}$ inch to a maximum of 2-3/4 inches. The direction of slip is south, parallel with or along the line of the A features." (J. Smith, written testimony, p. 7-8; A. Ex. 26, pp. 8-9).

20. "In contrast to the A, B, and C features, the D feature is usually apparent after light brushing of the sandstone because the planar surface erodes slightly more than the surrounding formation, leaving a thin line in the sandstone. While feature D has a distinct surface, that surface contains no evidence of gouge, cementation, crushing, or extensional separation." (A. Ex. 26, p. 8).

21. "Features A, B, and D are plainly shears, but A and B are more highly anastomosed and have a greater total displacement across them than the D features. In addition, grain crushing is more evident on A and B so that in brushing, these features appear in relief, whereas feature D exhibits lesser resistance to abrasion than the adjacent material. The resistance to brush erosion of features A and B is related to the greater cohesion of the fine grain sheared debris that exists there than along feature D." (A. Ex. 26, p. 14).

22. "Petrographic examination of samples of the D feature disclosed an abundance of voids and empty fractures which suggest that deformation did not take place repeatedly or was not intense enough to cause filling of the void spaces." (A. Ex. 26, p. A-3).

23. "AB features, viewed in a vertical exposure rather than in plan, are very innocuous looking. They represent essentially a single white line within a tan sandstone, and very little note was taken of them during the early mapping." (J. Smith, Tr. 2687).

(c) Location and Evaluation of ABCD Features.

24. We adopt as proposed the Staff's proposed findings 198 (in part), 199-203, part of 204, and 205-207,⁷⁵ in the following ten findings, except

⁷⁵ Applicants' proposed findings 393-439 cover the same ground in greater detail. We did not note any significant inconsistencies between these two sets of findings. We preferred the Staff's less detailed approach because these matters are substantially uncontested.

for the insertion of findings 31 and 32.

25. "The Type A shears strike between north and N 10° E, and the Type B shears strike approximately N 50° W." (S. Ex. 9, pp. 8, 28).

26. "The Type A shear zones, which occur in four principal strands, converge northerly in the site area. Their northerly and southerly extent has not been determined. No Type A features were located that were more than thirty to forty feet in length and were not interrupted by Type B features. Therefore, no Type A features were found that traversed the San Onofre site as a single, through-going feature." (J. Smith, Tr. 2769-71).

27. "The absolute end of the Type A features could not be found because of the thickness of saturated beach sand which precluded further trenching, but the decreasing progression of the width of the Type A features indicates that they were dying out as they approached the sea cliff. The Type A features are from four to six inches wide in the central part of the site and thin-out to approximately $\frac{1}{4}$ to $\frac{1}{8}$ of an inch at the sea cliff." (J. Smith, Tr. 2702-04).

28. "Six strands of the Type B shears are exposed in the site. These continue beyond the site to the northwest, but all visible strands of this set terminate in the southeasterly direction within the site excavation." (S. Ex. 9, pp. 8-9, 28; J. Smith, Tr. 2703).

29. "No effort was made to find the vertical depth of the A and B Type features. A good exposure of the features was obtained in both horizontal and vertical aspects at the site. In addition, these are minor features so there was no particular reason to search for their full depth. However, the features were found some 200 to 300 feet above sea level in area 3 so it is anticipated that they extend to that depth within the San Mateo formation." (J. Smith, Tr. 2693-2700).

30. "Where the two sets of shear zones intersect, each offsets the other. The maximum total displacement at their intersections and across clay inclusions has been observed not to exceed 4 inches. The sense of displacement is consistently left lateral for the Type A shears and right lateral for the Type B shears, indicating the development of a conjugate set of shears zones." (S. Ex. 9 at 9, 29).

31. Pleistocene marine and non-marine deposits have been recognized in the site vicinity. The primary Pleistocene terrace deposit is a series of crudely stratified mixtures of brown to gray-brown sand, silt, and clay with scattered lenses and layers of gravel, cobbles and boulders. This unit represents both marine and non-marine terrace materials deposited over wave cut benches. At the site, the terrace materials have been deposited on a broad, gently sloping coastal plain that is extensively developed along the

San Onofre coast. The thickness of these materials ranges from 30 to 50 feet. (S. Ex. 9, p. 5).

32. Age dating of California coastal terraces can be done by various methods, including dating of shell materials through thorium-protactinium disequilibrium determinations and inferences based on regional terrace elevations. Through a combination of these methods, the Staff developed an estimate, which we accept, that the terrace deposit in the vicinity of the San Onofre site is about 100,000 years old. (S. Ex. 9, pp. 6-7).

33. "Wherever the shear zones are observed in an exposure with overlying terrace deposits, they are truncated by the terrace deposits. This relationship indicates that the shear zones [were] formed within the San Mateo Formation prior to the deposition of the overlying terrace deposits. Thus they can be assigned a minimum age of 70,000 to 120,000 years⁷⁶ based on the age of terrace deposits which overlie the eroded surface of the San Mateo Formation." (S. Ex. 9, pp. 9, 29; A. Ex. 25, p. 28).

34. "The shear zones form a conjugate set consistent with the application of regional compressive forces in a northwest-southeast direction and in the opinion of the NRC Staff, the shear zones resulted from these wide spread northwest-southeast compressional stresses." (S. Ex. 9, pp. 9-10, 29; A. Ex. 25, p. B-3, 4).

35. "The shear zones were not created by movement on the Cristianitos Fault which strikes North-South, approximately 3000 feet inland of the San Onofre site. The Cristianitos fault is a normal fault and its last movement was from ten to four million years ago under an extensional environment, whereas the A and B Type features are the result of a compressional environment. Therefore, it is not possible for a structural and tectonic relationship to exist between the Cristianitos fault and the Type A and B features." (T. Cardone, Tr. 6638, 6646-47; S. Ex. 9, pp. 10; A. Ex. 25, p. 28; J. Smith, Tr. 2697-98).

36. "The A and B Type features are not surface expressions of a deep seated shear zone. They are only surface expressions of themselves and they exist in the San Mateo formation because of the characteristics of that formation. They are not parallel to the Cristianitos fault—or to any

⁷⁶ This range is consistent with the 100,000 year estimate in finding 32, above. The record contains several other age estimates for these terraces. See S. Ex. 9, pp. 6-7, finding 47, *infra*. The important thing for our purposes is that all of these estimates greatly exceed 35,000 years, a critical test for whether a fault is capable. 10 CFR Part 100, App. A, III(g).

other known fault. In addition, the A and B Type features have a sense of motion that is not compatible with motion on the Cristianitos fault." (J. Smith, Tr. 2697-98).

37. The C feature extends approximately 60 feet through one excavation cut-slope northeast of Unit 3. The strike of feature C is N 50°W to N 60°W and it dips between 5° and 19°NE. Feature C has not been observed to intersect the Type A, B or D features, or the terrace deposits. (S. Ex. 9, p. 14; A. Ex. 26, p. 8).

38. The C feature consists of thin, white resistant ribs approximately 1/8 to 1/4 of an inch wide. The C feature has the crushing and gouge characteristics of the A and B features, indicating a contemporaneous origin. In addition, the C feature has other properties similar to the A and B features, further strengthening the concept of contemporaneous development. (S. Ex. 9, p. 14; A. Ex. 26, pp. 7, 18).

39. The D feature consists of a sinuous pattern of individual hairline fractures which continue across the excavations for Units 2 and 3, but terminate in the north and west cut-slopes of the Unit 2 excavation. This feature, unlike the A, B and C features, has a distinctly planar surface and contains no gouge, cementation, or crushed material. (S. Ex. 9, pp. 14-15; A. Ex. 26, pp. 8-9; written testimony of J. Smith, pp. 7-8).

40. Displacement on the D feature is in a reverse sense. The displacement ranges from a minimum of 1/8 inch to a maximum of 2-3/4 inches. The direction of slip is south, parallel to the A features. The D feature strikes approximately N 70°W and dips between 15° and 20°NE. (S. Ex. 9, pp. 14-15; A. Ex. 26, pp. 9-10; written testimony of J. Smith, p. 8).

41. The age of feature D can be determined by its relationship to the A and B shear zones. (It does not intersect the C feature.) When the D feature intersects those features, they are offset in a reverse direction with the notable exception of the terrace deposits. This means that the D feature is younger than the A and B shear zones, but older than the terrace deposits. (S. Ex. 9, p. 15; A. Ex. 26, p. 11).

(d) Intervenors' Proposed Findings.

42. Under the heading of "Relationship of the ABCD Features to the CZD and OZD," the Intervenors propose seven findings, IF 202-208. Several of these proposed findings have record support, viz.: the strike of Feature A is parallel to the trend of the CZD (Tr. 2658); the CZD is north-south trending (Tr. 2437); and the Cristianitos Fault is north to slightly northwest trending (Tr. 2656). But standing as they do, alone and unexplained, these proposed findings have no apparent relationship to the issues in this case and we decline to adopt them. The burden is on the proponent of a finding to link it with other findings and with the issues in the case, unless such relationships are obvious or readily inferable from the

context. We are aware in this connection of the Intervenor's proposed conclusion of law that the CZD "could be related" to the A and B features. Like many geological speculations, this one is conceivable. However, the proof in this case is that the CZD does not project onshore and that the A and B features do not project offshore, at least not very far. See FF Nos. 27, and 28. The Intervenor also suggest in their conclusions that the Applicants should have performed further studies of the A and B features after the "discovery" of the fault "known as the CZD" to determine structural and tectonic relationships between them. As described herein, the investigations of all these features were exhaustive. See FF 6-11.

43. The Intervenor's proposed finding 205 — that the strike of Feature B is parallel to the general trend of the OZD — is not fully supported by the record. The witness stated that there were "significant deviations" from that parallel relationship. Tr. 2659. In any event, this proposed finding also stands unexplained and out of a meaningful context.

44. The implication of Intervenor's proposed finding 206 is that the A features extend out to sea toward the CZD and may intersect it. As noted in finding 27, above, the decreasing width of the A features toward the ocean indicates that they die out in that direction. Thus the only direct evidence in the record is contrary to the idea that the A features intersect the CZD at sea. (J. Smith, Tr. 2702-04).

45. The matters proposed in the first sentence of IF 207 have been found in our finding 8. The A and B features were discovered during excavation at the site and some of them are located under Unit 2. (SER, pp. 2-35; Ex. JLS-N following the testimony of Jay Smith).

46. The Intervenor's proposed finding 208 about 50 shears in a nearby quarry is supported by the record. (Tr. 2681). Again, however, we do not adopt it because it stands unexplained and out of context.

(e) Significance of ABCD Features.

47. The evidence shows that the ABCD features are minor features and that there has not been any significant displacement on them for a very long time. The Staff supports a minimum age of 70 to 120,000 years, which we believe to be a conservative estimate. Beyond that, the Applicants cite evidence suggesting that the A and B features might have been created some 800,000 or even millions of years ago. (A. Ex. 25, p. 27, B-3; S. Ex. 9, pp. 10-11).

48. As noted above, these features are variously referred to as "joints," "shears" and "faults" and combinations of these terms, such as "joints displaying small amounts of mutual shear displacement." AF 421. Whether these features were of a tectonic or non-tectonic origin is debatable. In any event, in view of their relatively slight displacements and the long periods

of time since any displacement, we believe that it makes no practical difference what label is affixed to them, or what their exact origins were. (J. Smith, written testimony, pp. 9-11; Tr. 2897-98).

49. The ABCD features are not "capable faults" within the meaning of 10 CFR Part 100, Appendix A, III(g). They have no significance for the safety of San Onofre.

3. Features at Trail 6.

50. The features at Trail 6, first noted in 1977, are small vertical offsets of the contact between the bedrock and the marine terrace deposits exposed in the seacliff approximately 3 miles south of San Onofre. (J. Smith, written testimony, pp. 12-13).

51. Geologic units in the vicinity of Trail 6 are sandstone of the Monterey formation, overlying marine and nonmarine terrace deposits, landslide deposits, and colluvium. (J. Smith, written testimony, p. 13).

52. Large landslides are common along the San Onofre coast where the Monterey formation is exposed to wave erosion. The offsets at Trail 6 exist within the boundary of a large (6 acres) landslide displaying many of the features common to massive movement in response to gravity. (J. Smith, written testimony, p. 14).

53. At the request of the NRC Staff, the Applicants performed a detailed geologic investigation, including trenching, to study the offsets and to determine their relationship to the landslide. They were requested to trench along the trend of the offsets to where they intersect the failure plane along which the landslide slumped. (SER §2.5.1.6, paragraph 2).

54. These investigations, which included detailed mapping, sea cliff exposures, trenching and observation, support the conclusion that the Trail 6 offset features are the result of a landslide. They were not caused by faulting and are not part of a fault. (J. Smith, Tr. 2856). In particular, displacement of the bedrock/marine terrace deposit contact by the offsets terminates at the landslide rupture surface; the displacement does not extend beyond the limits of landsliding. Therefore, we conclude that the Trail 6 offset features are the result of landsliding and have no significance to the seismic design of San Onofre. (SER §2.5.1.6, paragraph 4; testimony of J. Smith at 14-15; T. Cardone, Tr. 6727).

4. Features at Horno and Dead Dog Canyons.

55. Horno and Dead Dog Canyons are located approximately five miles southeast of the San Onofre site. Offsets in the bedrock/marine terrace contact were discovered near the mouth of these canyons. Investigation of these offsets by the Applicants included geological mapping, examination of aerial photographs, and examination of sea cliffs and canyon walls. No evidence of faulting was found. These investigations

established that the offsets were caused by seacliff failure and seaward landsliding. (Testimony of J. Smith, p. 16; Tr. 2760-61). The Staff agrees with the Applicants' conclusions. (T. Cardone, Tr. 6728-29).

56. Based upon the Applicants' investigations and the NRC Staff's review, we find that the offsets at Horno and Dead Dog Canyons were the result of seaward landsliding, and are of no safety significance to the San Onofre site.

5. Features at Target Canyon.

57. We adopt the Applicants' proposed findings 451 - 456 on these features, in the following findings:

58. "The stage 5e marine platform and overlying deposits are offset a small amount by narrow shears in Target Canyon, approximately 6-1/2 miles southeast of SONGS." (J. Smith, written testimony, pp. 16-17).

59. "Offsets of the stage 5e platform were observed at seven localities within an area measuring 2,000 feet by 1,000 feet in Target Canyon. Bedrock shears coincident with the offsets strike between north-south and north 15° east, and dip in the range 26° to 90°. Displacements of the marine platform are no more than 14 inches vertically, and are generally less than 12 inches. The displacements are chiefly normal dip-slip, with minor apparent horizontal and reverse slip on some shears." (J. Smith, written testimony, p. 17).

60. "Displacements in Target Canyon die out about 17 feet below the adjacent ground surface, ending in nonmarine deposits several tens of thousands of years old that overlie marine terrace deposits 125,000 years old." (J. Smith, written testimony, pp. 17-18).

61. "The offsets in Target Canyon have no association or alignment with any faults landward or seaward, and their zonal distribution is poorly developed. Assuming they represent a shear zone, projection toward the north along their strike would take them toward distinct and continuous strata in the San Onofre Breccia formation that are not faulted." (J. Smith, written testimony, p. 18).

62. "The association of the offsets and their shears with conjugate sets of fractures adjacent to a buried ridge of San Onofre Breccia suggests an origin related to differential compaction of the overlying softer sediments. The gradual dying-out upward of the displacements tends to support this possibility, rather than that of a fault origin. Offsets of fault origin would be more likely to have displacements indicating abrupt episodic movements." (J. Smith, written testimony, p. 18.)

63. "The weight of the evidence from investigations of offsets in Target Canyon favors a nontectonic origin for them. In any case, the offsets are small, tens of thousands of years old, and have a different orientation from most faults in the region. Furthermore, they are more

than five miles from SONGS, and even their projection beyond known locations would be tangent to a five-mile radius drawn around SONGS. Accordingly, they are not significant to the site." (J. Smith, written testimony, pp. 18-19).

6. Faults E and F.

64. We adopt the Applicants' proposed findings 457-460 and 462-465 on these features in the following findings:

65. "Fault E lies from about 500 to 5,000 feet east of the Cristianitos Fault on the south flank of the San Onofre mountains. Fault F lies about 2,000 feet east of fault E." (P. Ehlig, written testimony, p. 1).

66. "Faults E and F strike about north 15 degrees west, nearly parallel to the Cristianitos fault." (P. Ehlig, Tr. 2899-2900).

67. "Faults E and F have subparallel trends striking nearly north-south, but they dip steeply toward each other. Their displacement is small (300-400 feet for Fault E and about 25 feet for Fault F) and chiefly normal dip-slip." (P. Ehlig, written testimony, pp. 2-3).

68. "Although Fault E might appear to join the Cristianitos fault if projected in plainview, it dips in the opposite direction from the Cristianitos, so the two faults diverge at depth. Therefore, Fault E is not a branch of the Cristianitos fault." (P. Ehlig, Tr. 2904-2905).

69. "Faults E and F are secondary features probably associated with early deformation at the start of the Cristianitos fault development. However, they do not join the Cristianitos on the surface or at depth." (P. Ehlig, Tr. 2903-2904).

70. "Throughout the area of Faults E and F there is no topographic expression of faults. Where marine terrace platforms with or without terrace deposits exist there is no evidence that they are offset by faulting. These platforms are very old, probably a few hundred thousand years." (P. Ehlig, written testimony, p. 3; Tr. 2940-2941).

71. "The age of the E and F faults is imprecisely known but displacement is younger than about 14 or 15 million years old, the age of the Monterey Formation adjacent to the fault. Both faults lack physiographic expression and show no evidence of cutting the coastal terrace. Fault E passes beneath the remnant of a wave cut terrace bench at an elevation of about 350 feet without displacing the bench or an overlying soil unit. The bench is probably a few hundred thousand years old, thus suggesting that fault movement ceased by Late Pleistocene time." (P. Ehlig, written testimony, p. 3).

72. "Faults E and F were most likely formed in an east-west extensional tectonic regime 4 to 10 million years ago, and they thus do not fit the present north-south compressional regime. They have had no movement

in the past several hundred thousand years. They are not capable faults and, thus, are not significant to SONGS." (P. Ehlig, written testimony, p. 4).

E. The Cristianitos Zone of Deformation (CZD).

1. Introduction.

Contention 2 states that:

Whether characterization of certain offshore geologic features as a zone of deformation, referred to as the Cristianitos Zone of Deformation (CZD), or whether any additional information about the CZD which became available subsequent to issuance of the construction permit render the seismic design basis for SONGS 2 and 3 inadequate to protect the public health and safety.

The evidence concerning the CZD was based upon two lines of investigation. These concerned studies of onshore and offshore features of possible relationship to the CZD. The evidence includes the research conducted, geologic characterizations, varying interpretations of the nature of the CZD, its relationship to the OZD, and its age based upon stratigraphy and both onshore and offshore platforms and terraces.

2. Eight witnesses testified on various of the foregoing aspects of the CZD. The Applicants witnesses were Dr. David G. Moore and Dr. Roy Shlemon (Moore, written testimony, pp. 37-50; Shlemon, written testimony, pp. 7-10). The witnesses for the Staff were Dr. H. Gary Greene, Mr. James Devine and Mr. Robert Morris, U.S. Geological Survey (USGS), Dr. Michael Kennedy, California Division of Mines and Geology and Mr. A. Thomas Cardone (Greene and Kennedy, SER, Appendix F; Morris, Devine, Greene and Kennedy, SER, Appendix G; Cardone, SER, Section 2.5.1.12). Dr. Kennedy also testified for the Intervenors, as did Mr. Mark Legg (Legg, written testimony, pp. 10-12).

3. The Staff set forth in its Proposed Findings No. 254-255 certain helpful historical information based upon material contained in the SER. We adopt those findings for their historical perspective and repeat them as the following Findings Nos. 4 and 5.

4. "A number of offshore seismic reflection surveys were performed by the Applicants and by others in the vicinity of the site over the 10-year period beginning with the development of the safety analysis for the construction permit. The purpose was to investigate the structural features offshore. (SER 2.5.1.12)."

5. "On May 8, 1980, the Staff requested that a comprehensive review be made by the USGS of all marine geophysical data relevant to the character and recency of faulting along the offshore extension of the Cristianitos fault in the vicinity of the San Onofre 2 and 3. This request

was concerned specifically with a proposed structural relationship between the Cristianitos zone of deformation (CZD) and the OZD. The NRC requested that this review be made jointly by H.G. Greene of the USGS and M.P. Kennedy of the California Division of Mines and Geology, because of the extensive joint research effort then underway by Greene and Kennedy on aspects of the structural geology of the southern California borderland. Their review and a subsequent report were completed on July 18, 1980. Their report, "Review of Offshore Seismic Reflection Profiles in the Vicinity of the Cristianitos Fault, San Onofre, California" appears as Appendix F to the SER. (SER 2.5.1.12; SER, Appendix F)."

6. Greene and Kennedy had coined the name "Cristianitos Zone of Deformation" simply because the Cristianitos fault is nearby. The name was not chosen to imply a relationship with the Cristianitos Fault. (Tr. 2139-40).

7. The Review of Greene and Kennedy identifies the seismic reflection profiles they used, those which were new to them, their methods of interpretation of the data, a discussion and their conclusions (SER, Appendix F).

8. The conclusions reached by Greene and Kennedy are set forth at SER, Appendix F at F7-F8 and we repeat them here.

Interpretation of marine continuous seismic-reflection profiles in the vicinity of SONGS and concentrated along the projected, offshore trace of the Cristianitos fault indicates to us that two structural zones of deformation are present in this area. The first and most well defined zone is a segment of the "OZD," a recognized Quaternary fault zone (Greene and others, 1979; Hileman, 1979; Legg and Kennedy, 1979). The second is less well defined but nevertheless exhibits characteristics similar to those of the "OZD." This second zone, the "CZD," consists principally of highly fractured and faulted asymmetrical anticlinal structures.

The "CZD" and associated folds to the east combine to form a broad structural zone (up to 3 km in width) which projects onshore to the north. The southeast end of the "CZD" could become incorporated with a major syncline of the "OZD". However, the structural relationship of the "CZD" with the "OZD" is unconfirmed because of a "data void" (Plate 1).

The age of most recent faulting along the "CZD" is unknown. All seismic profiles examined show that faults associated with the "CZD" end at or near the surface of an apparent wave-cut platform that is overlain by acoustically transparent sediment. Nowhere within the "CZD" is there evidence of seafloor displacement.

It is our conclusion that a structurally deformed zone consisting of correlatable *en echelon* faults and folds, many extending into shallow subsurface strata (probably Neogene in age), is present along the expected offshore extension of the "CZD." The seismic reflection data reviewed here show that a fairly continuous fault zone extends south to southeastward offshore from SONGS to within 1 km of the "OZD," where a projected connection is possible.

2. Data Voids and the Relationship of the CZD and OZD.

9. The Review of Greene and Kennedy also included a paragraph explaining the term "data void" which appears on Plate 1 of Appendix F of the SER. We quote that paragraph below.

Areas in which good quality data are lacking or the density of seismic profiles are insufficient to map and correlate structures at a scale of 1:24,000 are designated as "Data Voids" (Plate 1). It must be emphasized that the notation "data void" does not mean that no data are available, only that we felt the data are insufficient for correlation with confidence between lines. The data in some areas are of sufficient quality to permit the extension of geologic structures by inference across expanses mapped as data voids; in such cases, these structures are mapped as inferred or questionably inferred. (SER, Appendix F, p. F5; also see Tr. 3134).

10. As a further explanation during the hearings, Dr. Greene stated that, "as we use the term 'data void,' it represents basically two things. One thing is that either there is a lack of data there, no lines have been run in that general vicinity, or that lines have been run in that vicinity, but they were not of good enough quality to be usable for our mapping. In other words, due to perhaps the shallowness of the water, the lithology, the types of rocks that existed on the sea floor, you did not get a good reflection profile, and so you could not use that to develop your structural picture." (Tr. 2136). (Also see Tr. 2283-86, 2288, 2300-01).

11. As indicated above, the significance of and reason for the appearance of the term "data voids" on Plate 1 (SER, Appendix F) was extensively explored in the hearings. Dr. Greene stated that seismic profiling for the San Onofre area was "the greatest density of track lines that I've ever dealt with as far as an area of this size." (Tr. 2282). Dr. Kennedy agreed that it was an "extremely tight series of tracks." (Tr. 2282-83). Further, Witness Kennedy indicated that even with more profiling in the areas marked data voids there was no way to predict that good mapping could be accomplished in those areas. (Tr. 2624-2628).

12. Drs. Greene and Kennedy were not complaining about a general lack of data. Rather, at times, there wasn't a specific line that went through a spot they were particularly interested in. (Tr. 2286).

13. The data void problem affected determination of whether there is a relationship between the CZD with the OZD. Concerning that Dr. Greene stated, "profiles did not cross the intersection, per se." (Tr. 2285).

14. Greene and Kennedy also submitted an Addendum to their July 18, 1980 Review which was transmitted to the NRC by Dr. H. William Menard. The Addendum was prepared as a result of their review of new data collected for the Applicants in June 1980 by Nekton, Inc. That Addendum appears at pages G8-G11 of SER, Appendix G. Included in this Addendum is the statement, "Although no seismic lines collected by Nekton in the June 1980 survey actually cross the proposed CZD-OZD intersection of Greene and Kennedy (1980) the CZD can be extended by way of this data (June 1980 Nekton data) to an area where we interpret it to merge with a synclinal fold and adjoining fault associated with the OZD." (SER, Appendix G).

15. The conclusion reached by Greene and Kennedy in this Addendum is as follows:

The CZD merges with or is truncated by the OZD in the area offshore from SONGS (plate 1). Generally faults within the CZD with few exceptions (plate 1) displace shallow stratified sedimentary rock that lies beneath a prominent unconformity and younger poorly stratified sediments. The June 1980 Nekton data support the conclusions reported previously by Greene and Kennedy (1980). (SER, Appendix G, p. G11)

16. The Intervenor introduced, as their Exhibit No. 4, a letter dated August 11, 1980 from Dr. James Davis, the Chief Geologist of the State of California and Dr. Michael Kennedy to the NRC Staff. That letter indicated that it was their "tentative conclusion that the structure termed 'Cristianitos zone of deformation' (Greene and Kennedy, 1980) does extend offshore from the present-day coastline in the vicinity of SONGS and connect with the OZD." That letter also requested that the NRC instruct the Applicants to evaluate the seismic potential of the Cristianitos fault based upon the structural relationship outlined in the Greene and Kennedy 1980 report. (Intervenor, Exhibit No. 4; see also Intervenor's Proposed Finding of Fact No. 160).

17. The Intervenor in their Proposed Findings of Fact cite Staff Witness Cardone's testimony that the Staff had not requested the Applicants or the USGS to do any further research since the NRC had received the Greene and Kennedy "Review" and the Davis and Kennedy letter. (Intervenor's Proposed Findings of Fact Nos. 161, 162; Tr. 6513-6518).

18. Witness Kennedy was questioned about the Davis and Kennedy letter and what response if any there had been to it. The Witness stated that subsequently the State received the information it had requested and that their request had been responded to. The material received was the work of Applicants' Witness Dr. David Moore, and that material satisfied the request of the State. (Tr. 2469-74; Tr. 2513-14).

19. The Intervenors do not acknowledge Mr. Cardone's statements that no further research was asked for because none was needed or felt necessary by the Staff (Tr. 6513-6519).

20. Subsequent to the Greene and Kennedy, 1980 Review and the Greene and Kennedy "Addendum," the USGS submitted to the NRC a "Review of Geologic and Seismologic Data Relative to the San Onofre Units 2 and 3 Operating License Application." This Review was conducted by Mr. Robert H. Morris and Mr. James F. Devine with assistance from Dr. H. Gary Greene and Dr. Dudley J. Andrews. This Review included consideration of a complete summary of the Applicant's analysis of the geological and seismological data for Units 2 and 3, as well as both the original 1980 Review of Greene and Kennedy and their Addendum (SER, Appendix G).

21. Intervenors in their Proposed Findings of Fact, do not cite a conclusory paragraph in the USGS Review which stated, "The USGS, in general, concurs with the conclusions stated by the applicant and its consultants regarding the history and age of last movement of the Cristianitos Fault, its relation as one of several faults of the CZD of Greene and Kennedy, and its apparent lack of potential for movement in response to movement on the OZD." (SER, Appendix G, p. G4).

22. The existence of the so-called data voids of Greene and Kennedy were acknowledged in the SER and that fact is noted by the Intervenors in their Proposed Findings Nos. 150 and 152. (See SER, p. 2-46; SER, Appendix F).

23. Witness Greene was asked whether additional profiling would allow better mapping of the possible faulting in the areas labeled "data voids." He responded that this could not be answered specifically because of the definition of data void. (Tr. 2407-08; Tr. 2413; also see Tr. 2439-40).

24. The Board believes the Greene and Kennedy "data voids" are of little significance in relation to the seismic safety at San Onofre but it has not relied solely on the foregoing material in reaching this decision. Earthquakes are generated on faults and, where faults have branches, movement on the main fault can be transmitted to the branch. Thus, the possible extension of the Cristianitos fault to the SCOZD could be impor-

tant in the seismic considerations affecting San Onofre. We repeat in the following finding the results of the Nekton survey designed to explore this possibility.

25. "A seismic reflection profile survey was conducted by Nekton, Inc. for the applicant to provide higher resolution in the shallow offshore strata to help determine whether or not the Cristianitos fault projects toward the OZD. The report (Nekton, 1980) concludes:

(a) The Cristianitos fault does not project enough seaward (i.e., south-southeasterly) to be identified in the survey area. Where the fault may be projected to occur, there is no evidence of its existence. Nekton concluded that along its offshore projection, displacement diminishes and the Cristianitos Fault dies out, possibly in a number of lesser faults and small folds. It does not connect to the OZD.

(b) The OZD was mapped parallel to the coastline for 8.8 kilometers in the central and northern oceanside survey area. In the central part, at least two branches of the fault occur and their width is limited. To the north, it broadens to a zone of deformation up to 0.6 kilometers (0.4 miles) wide. The OZD is not present in the Dana Point survey area.

(c) Other faulting offshore—a number of minor faults are interpreted to be present offshore in the survey area. Minor faults in the area are short in length and occur below a Pleistocene erosion surface in Tertiary age beds.

(d) Fault movement—none of the minor faults shows evidence of movement following the period of erosion which developed the Pleistocene erosion surface. Eighteen kilometers south of San Onofre, the OZD shows evidence for at least two periods of probable movements. Movements during one period have displaced the Pleistocene erosion surface and the movements during the other period appear (locally) to displace terrace deposits of probably Holocene age." (SER, p. 2-47).

26. In reviewing the record before us, the Board has been impressed with the amount and high quality of the investigations carried out by the Applicants of both the onshore and offshore areas of the San Onofre site. In their Proposed Findings, neither the Staff nor the Intervenors fully covered the rich record. The Staff chose to rely primarily upon its review as presented in the SER, while the Intervenors (Nos. 147-171) do not arrive at a conclusory finding, nor do they assert how those findings relate to Contention 2. Their findings are individually based on the record, but no context is provided to aid the reader. Collectively their findings are presented largely out of context, presumably with the intent of showing that both the Cristianitos Fault and the CZD may be interpreted as capable fault structures. The record does not support that conclusion, nor was that conclusion reached by the Intervenors in their findings. On the other hand the Applicants presented a detailed account of their studies and

conclusions in their Proposed Findings of Fact. We have reviewed the underlying record and find that the Applicants' Proposed Findings are fully supported by it. We adopt the Applicants' Proposed Findings Nos. 470-479, 481-495, 499-525, and 526 (in part), and repeat them in the following findings.

3. History of Offshore Investigations.

27. "Since the late 1960's, more than 2500 km of seismic reflection transects have been utilized by the Applicants to investigate the offshore geology of SONGS. About 1500 km of deep-penetration common-depth-point (CDP) seismic reflection data were used in regional studies, along with several hundred kilometers of higher resolution Sparker data. Most of the remaining transects have been concentrated on or near the San Onofre Shelf and upper Continental slope. Altogether, the geophysical studies of the geologic structures offshore of SONGS have extended for more than 100 km to the northwest and southeast of the plant site, and seaward across the shelf to the deep basins of the southern California Continental Borderland. The most detailed of the geophysical investigations were conducted close to SONGS, with most transects confined to a 15 km by 30 km area on the continental shelf which parallels the coastline between San Mateo Point and Oceanside, hereinafter referred to as the San Onofre Shelf. (Moore, written testimony, p. 7; Figure DGM-C)."

28. "The submarine topography off southern California comprises an irregular terrain of basins and submarine ridges bordered along the coastline by a narrow continental shelf that varies from less than a kilometer to a few tens of kilometers wide. The San Onofre Shelf is oval in shape and varies in width from 6 km in its northern end, to more than 9 km in the central area, narrowing again to about 6 km in the southern end near Oceanside. The narrow shelf here has a very gentle slope of about 10 meters per kilometer from the shoreline out to the 100 meter contour, near the shelf edge. The steep basin slope beyond the shelf edge has a declivity of over 260 meters per kilometer and extends down to the basin floor at a depth of about 800 meters. The greatest concentration of geophysical data is largely confined to the shelf area because of the adjacent topography and the nature of the strata underlying the shelf. The shelf edge is a natural barrier to the collection of useful geophysical data because of its steepness and the numerous sea gullies that have incised it to form a highly irregular topography. All of the geological structures important for SONGS 2 & 3 lie landward of this steeply sloping terrain and on the San Onofre Shelf. (Moore, written testimony, pp. 4-6; Figures DGM-A, DGM-B)."

29. "Detailed examination and interpretation of a very large amount of relatively close spaced seismic reflection profiling data have provided information to construct a tectonic map of the San Onofre Shelf and have

allowed interpretation of the structures in that area with a high degree of confidence. The greatest number of seismic transects and those having the closest spacing were concentrated in the shelf area south and southeast of SONGS where the data are of good quality, and they reveal a relatively complicated structural situation with well determined stratigraphic units. Collectively, more than 1000 km of seismic profile transects are contained within the San Onofre Shelf area with a line density of about 2.5 km per sq. km and an average line spacing of about 400 meters." (Moore, written testimony, pp. 7, 9 and 49; Figure DGM-C).

30. "Because of the extraordinary line density of the seismic profile transects, Staff witness, Dr. G. Greene, (USGS) stated '[There was] no lack of general [offshore] data' (Greene; Tr. 2286). He went on to conclude that the track line spacing in this investigation is '. . . the greatest density of track lines that I've ever dealt with . . . (Greene; Tr. 2282)."

31. "Several different surveys were run during the last 10-15 years. Exhibit 36, DGM-L shows that the major structural features of the region were detected in a very rough way by the earliest reconnaissance survey done by Marine Advisers in 1970. Dart core and bore hole samples of the sea floor were also taken to provide ages for the seismic stratigraphy seen in the recorded sections. The position of the survey track lines and bottom samples are shown in Figure DGM-C. The most recent surveys, the Woodward-Clyde (1978) and Nekton Survey (1980), data are important to the offshore investigations because of their high quality, resolution, and close spacing of transects which show major structural elements of the San Onofre Shelf in considerable detail. They also provide a high degree of confidence in correlating geological structures from one line to the next. The Nekton survey lines were specifically positioned, and data were collected in 1980 to cover the area south of the Woodward-Clyde survey where an offshore projection of the Cristianitos fault had been postulated to intercept the South Coast Offshore Fault within the South Coast Offshore Zone of Deformation. (Moore, written testimony, pp. 8-9, 35; Tr. 2982)."

4. Offshore Geology—Relationship of the CZD and Cristianitos Fault.

32. "As shown by these surveys, a great thickness of rock strata underlies the near surface erosional and depositional features of the San Onofre Shelf. All of these strata were originally deposited horizontally or gently sloping, and they have subsequently been variously warped in places into folds or broken by faults as the region has been subjected to compressional, tensional, or shear forces. When mapped and age dated, these rocks and their structural features indicate the tectonic history of the region. The

most conspicuous and consistent features of the offshore shelf are those associated with the South Coast Offshore Zone of Deformation (SCOZD), on the western and southwestern edge of the Shelf. The SCOZD has been assumed to be one of the zone of folds and faults referred to as the Offshore Zone of Deformation (OZD) that includes the Newport-Inglewood Zone of Deformation (NIZD) to the north and the Rose Canyon Fault Zone (RCFZ) to the south. (Moore, written testimony, pp. 10-13; Figure DGM-E)."

33. "The most important element of the SCOZD is the South Coast Offshore Fault (SCOF) which occurs as a single trace in the southernmost part of the area and as a double trace in the central part, extending to the northwestern part of the shelf as a less well-defined single trace. Over most of this length, the SCOF is associated with the crest or near the crest of a large anticline or anticlinorium designated the San Onofre Shelf Anticline (SOSA). Only in the southernmost part of the shelf where the SOSA dies out, does the SCOF continue as a single trace unassociated with folding. The SOSA and its eastward flanking syncline are much larger features than the very gentle folds to the east.⁷⁷ (Moore, written testimony, pp. 13, 39)."

34. "Flanking the SOSA on the northeast is the San Onofre Shelf Syncline (SOSS), a very broad and conspicuous asymmetrical fold on all seismic profiles that cross it. SOSA and SOSS show remarkable continuity along the central part of the outer San Onofre Shelf, where they are continuous for more than 9 km, or over 30,000 feet. Other folds pairs occur to the northwest and are similarly oriented to the SCOF, but they do not have the continuity of those to the south. (Moore, written testimony, pp. 13-14)."

35. "The principal structural features of strata beneath the San Onofre Shelf are shown on Figure DGM-E. This structural map (DGM-E) is designed to display the amplitude or magnitude of folding as well as continuity of the major features and to contrast the age of faulting in the different parts of the area. (Moore, written testimony, pp. 11-12)."

36. "In summary, the principal structural features on the San Onofre Shelf are the SCOF and the intimately associated SOSA and the SOSS. The folds in this zone are very long and continuous, whereas the principal features to the east are much smaller, shorter and discontinuous. The longest fold east of the SCOZD is only about 1/5 the size of the SOSA of the SCOZD. (Moore, written testimony, pp. 14-15)."

⁷⁷ The Board notes that the "gentle folds" indicated here are part of Greene and Kennedy's CZD.

37. "The use of the term Cristianitos Zone of Deformation (CZD) implies that offshore structures within that zone are somehow related to the Cristianitos fault, an implication not supported by the seismic data. The Cristianitos fault is a discrete, single, normal fault resulting from east-west extension and, thus, is by nature a tensional feature. On the other hand, the faults and folds of the CZD are typical compressional features. Also, the faults of the CZD are shallow and generally do not extend downward to any great depth in the section as would be expected of an extensional feature such as the Cristianitos fault. (Moore, written testimony, p. 45, Tr. 2997; J. Smith, Tr. 867-868)."

38. "Much detailed profiling has been done along a projected seaward extension of the Cristianitos fault to test its postulated connection with the SCOF. Careful examination of seismic lines closest to the Cristianitos fault and across its offshore projection do not reveal any feature which could be interpreted as an extension of the Cristianitos fault beyond about 6,000 feet (2,000 meters) from the shoreline. Faults occurring farther seaward along a projection of the Cristianitos fault have displacements that are opposite to that of the Cristianitos fault, and which are much too deep and old to be associated with the fault. The faults nearest such a projected offshore trend have been inactive for a period greatly predating the opening of the Capistrano Embayment and activity on the Cristianitos fault. (Moore, written testimony, pp. 44-45, 48; J. Smith, written testimony, Contention 4, pp. 21-32, 37; Tr. 840-846, 870-873)."

39. "Additionally, the northerly trending zone of gentle folds and associated faults east of the SCOZD and west of the Cristianitos fault, i.e., the CZD, does not form a connection between the SCOZD and the onshore trace of the Cristianitos fault. (Moore, written testimony, p. 37). Instead, faulting along the SCOZD contrasts strongly in terms of amount and continuity as well as age of faulting with that along the so-called CZD (Moore, written testimony, p. 37). The CZD is largely associated with the Miocene Monterey formation. Southeast of this zone and inshore are a number of relatively minor folds and associated faults, which are associated with deeply buried older formations. (Moore, written testimony, p. 14)."

5. Stratigraphy of the Offshore Area.

40. "The stratigraphy of the offshore area in the vicinity of SONGS, which is a very important aspect of Applicants' studies, has been interpreted in the context of the evolution of the Capistrano Embayment and the Cristianitos fault, and has been based on extensive detailed geologic mapping done for the Applicants and extending inland several miles.

Offshore stratigraphic units have been identified by correlating data from borings and dart cores with seismic reflection profile data. (Moore, written testimony, p. 15; Tr. 2965-2967)."

41. "The oldest unit recorded offshore, and the unit that serves as effective acoustic basement, is believed to be the San Onofre Breccia which, because of its poor bedding, and lack of coherent internal reflectors produces a fuzzy appearance in the profiling records. It also underlies the sea floor off Dana Point at the northern boundary of the region. Consequently, data quality in this area is reduced significantly. South from Dana Point and approaching San Onofre, the relatively simple and nearly-horizontal bedding nature of the San Mateo and Capistrano formations make close spacing of seismic reflection profile lines unnecessary because, in areas of very simple structure, close-spaced traverses do not yield significantly greater information than wide-spaced lines. Early reconnaissance lines supplied ample data for identifying major structures in that area. (Moore, written testimony, pp. 6, 15, 18; Figure DGM-F; Tr. 3008-3012)."

42. "Farther southeast of the northerly-trending structures east of the SCOZD there are deeply buried faults in the San Onofre Breccia overlain by undisturbed Monterey formation. (Moore, written testimony, p. 43)."

43. "Overlying the San Onofre Breccia is the Monterey formation which has a very characteristic seismic signature of many strong, continuous, repetitive reflectors with very little scattering or diffraction. Seismic profiles of the Monterey formation almost anywhere along the California coast show the characteristically well-developed bedding and its typical response to tectonic compression by formation of well-developed anticlines and synclines. Offshore San Onofre, older and younger units of the Monterey formation rocks have been mapped with an angular unconformity being clearly expressed between the two. The most pronounced folding has taken place at depth beneath the youngest Monterey unit. (Moore, written testimony, pp. 18-19; Figures DGM-C, DGM-G, DGM-H, DGM-I)."

44. "The Capistrano formation overlies the younger Monterey unit and is less well bedded than the Monterey formation. Several borings in the vicinity of the plant were also used to identify the Capistrano formation. The age of the Capistrano formation was determined to be about four to ten million years old showing a Delmontian Late Miocene age. (Moore, written testimony, p. 20). The pinching-out in places of the Capistrano formation against the Monterey formation indicates that some degree of folding took place in the SCOZD during the time the Capistrano formation was being deposited. In the northern part of the San Onofre Shelf, the Capistrano formation is relatively undeformed by faulting and folding except in the immediate vicinity of the SCOZD. The Capistrano formation

and the younger unnamed Plio-Pleistocene unit overlying it disappear southward on the San Onofre Shelf. Onshore the Capistrano formation is sharply terminated on the east by the Cristianitos fault. On the San Onofre Shelf, however, the seismic stratigraphic unit identified with the Capistrano formation is less-sharply limited on the east and south. This is supportive of the lack of evidence for the Cristianitos fault on the San Onofre Shelf, and, hence, a less sharply defined easterly termination of the Capistrano formation. In summary, it is apparent that the SOSA and SOSS are by far the most prominent features on the shelf and that the area of gentle broad folding to the east is, with a few exceptions, of a much lesser amplitude and a different character. (Moore, written testimony, pp. 20, 39-40; Figures DGM-F, DGM-G, DGM-H, DGM-I)."

45. "Offshore, a relatively-thick stratigraphic unit of Plio-Pleistocene age underlies younger Pleistocene terrace deposits. The unit is acoustically transparent and generally without good internal reflectors, suggesting it is soft and poorly stratified. This younger stratigraphic unit can be clearly differentiated from the older bedrock formations by correlation and by the presence of an intervening well-defined unconformity that appears on the seismic profile records. The intensification of the folding as indicated by the configuration of this and lower unconformities between the formations increases with depth and is most striking beneath the youngest Monterey formation unit. Folding in the Capistrano and younger units is relatively mild and, in fact, disappears in the northern part of the offshore area, north of Woodward Clyde line 841. (Moore, written testimony, pp. 20, 37-39; Figure DGM-H)."

6. Relationship of the SCOZD to the CZD.

46. "The features now characterized as the CZD have been known to people associated with the site for some period of time, were discussed back in the construction permit days, and were identified quite some time ago, before the Greene and Kennedy study (Devine, Tr. 6115). Much of the data on the structure of the offshore area in the vicinity of SONGS were generated several years ago by Marine Advisers and Western Geophysical. In 1970, Marine Advisers mapped several minor folds and faults in the vicinity of the CZD, but gave these features another name. (Moore, Tr. 4065-70; Exhibit No. 36, DGM-L). In addition, in 1978, Woodward Clyde Consultants mapped a zone of minor folds and faults in the same general vicinity as the features mapped by Greene and Kennedy who, in 1980, assigned the name 'Cristianitos Zone of Deformation.' These features, mapped several years ago by the Applicants in the area of the CZD,

have been shown to be several discontinuous faults of unknown strike on the shorter sections. (J. Smith, Tr. 829, 830, 864; Moore, Tr. 2982, 4069, 4084)."

47. "The youngest and most continuous faulting on the San Onofre Shelf is confined to the SCOF of the SCOZD. There is a striking difference in continuity and intensity of faulting between that of the SCOF and the relatively small and discontinuous faults associated with the folding to the east. The SCOF at some locations extends to the sea floor and through the Plio-Pleistocene sedimentary unit, thereby confirming the relatively recent activity on this fault. Throughout much of its length the SCOF is a dual-trace fault or a broad fault zone. In the northwestern part of the shelf, the SCOF appears to be dying out or becoming less distinct, and the SOSA and SOSS are becoming discontinuous. Toward the southeastern end of the shelf the SCOZD clearly changes its expression from that of a very large, complexly-faulted anticline to a single fault across which well-bedded Monterey Formation reflectors are juxtaposed against a zone of incoherent or fuzzy reflectors suggestive of San Onofre Breccia. (Moore, written testimony, pp. 40-42)."

48. "The SCOF is best developed along the outer edge of the central part of the San Onofre Shelf where there is a change in trend of the fault from northerly to northwesterly. Along this change in trend, the fault is closely associated with the SOSA, and it is probable that the folding is a direct result of strike-slip faulting resulting from compression accompanying the change in direction. The faulting in the anticline is well developed and extends from the sea floor or near the sea floor to depths as great as surveying equipment is able to penetrate. In contrast, the north-trending folds of the CZD east of the SCOF are associated with largely intraformational faulting within the flexures. This is explained by recognizing that a thick sedimentary section of Monterey-type lithology can develop very high pore pressures and consequently low shear strength if bent even slightly. When gently or broadly folded this type of sediment typically develops many small folds or flexures along the crests of larger anticlines. The flexures are of a scale difficult to detect with seismic profiling equipment and, thus, often produce a record resembling a zone of disturbance or deformations, but which is not clearly related to faulting. Intraformational faulting has limited upward and downward extent, and commonly develops in association with this minor folding superimposed on larger broad folds as illustrated in Woodward Clyde profiles 836, 839 and 841 of Figure DGM-H. (Moore, written testimony, pp. 42-32)."

49. "Greene and Kennedy's postulated connection of the CZD and the SCOF relies on the existence of a narrow band of fault-bounded deformation trending southeast at an angle to the main body of folding in the CZD. Dr. Moore interprets this deformation instead to be a deeply buried

small anticline, and a nearby adjacent "fault" to be a misinterpretation of seismic-signal crossovers on a relatively steep-sided flank of the asymmetric SOSS. (Moore, Tr. 3074). Even if this fault and a connection with the SCOF existed, the area of the postulated connection is overlain by clearly unfaulted strata of probable Late Miocene age, requiring the conclusion that there has been no movement on the faults for at least 5-6 million years. Therefore, these questionable faults and their purported connection with the OZD have no real significance. (Moore, written testimony, pp. 46-47; Tr. 3075)."

50. "Regarding a postulated connection between the SCOF and the CZD, it is also important to distinguish between connections of faults rather than of so-called zones of deformation. The orientation and continuity of faults is the key issue, inasmuch as only movement on faults can cause earthquakes. Folds are of great geologic interest in determining tectonic history, but are not associated with earthquake generation. Faulting in the CZD is the result of compressional forces related to folding. Faults of the CZD do not displace the Pleistocene erosional surface and, therefore have not moved for thousands of years according to data based on the ages of the terraces. (Shlemon, written testimony, pp. 9-10). Therefore, Greene and Kennedy's postulated near connection of the CZD and the SCOF relies on questionable and difficult interpretation of deep faults in the records. However, unfaulted probable late Miocene strata overlying this area make it clear that movement on these questionable features has not occurred since Miocene time. (Moore, written testimony, pp. 45-46, 48-49; Tr. 3074-3075, 3079)."

51. "The closest approach of faults of the CZD to the SCOF is approximately 10,000 feet (or 3.6 km) when measured along a projection of the onshore Cristianitos fault. This interpretation cannot support a postulated connection between the SCOF and the faults of the central shelf area. (Moore, written testimony, p. 46)."

7. Quaternary Studies.

52. "Once the regional and local stratigraphy and structure have been determined, it is necessary to evaluate and assign the ages to the various features. From the regional studies it is clear that broad tectonic uplift has been occurring for hundreds of thousands of years in the western United States, including the California coastline and the SONGS region, as indicated by elevated wave-cut platforms. While this uplift may indicate the existence of tectonic stress, it does so on a broad continental scale rather than a local scale, and would include the 25 to 40 mile region surrounding San Onofre. (Shlemon, Tr. 3177-3180; SER, Section 2.5.1.8)."

53. "Applicants have investigated the broad chronological framework of the entire San Onofre region, on land and offshore, in order to extrapolate and determine the age of features offshore. The results of these investigations are contained in Exhibits #28, RJS-1, #29, RJS-2, and #30, RJS-3. These investigations showed the Quaternary stratigraphy in the San Onofre area to be rather remarkable and perhaps the best exposed on the entire west coast of the United States. (Shlemon, Tr. 3168)."

54. "Dr. Shlemon's investigations for the Applicants involved collecting and interpreting all relevant literature dealing with the Quaternary geology of the area. He also mapped marine and fluvial terraces and collected samples as appropriate to determine the age, continuity and deformation of marine platforms and their overlying sediments. Investigative procedures included measuring and describing soil profiles; collecting and interpreting water-well logs; obtaining and interpreting uranium-series, amino-acid, and radiocarbon dates; and associating terrace ages with the Quaternary marine isotope stage chronology. (Shlemon, written testimony, p. 6). In support of both Dr. Shlemon and Dr. Moore, dart core and bore hole samples of the sea floor were also taken to provide ages for the seismic stratigraphy seen in the recorded sections. (Moore, written testimony, p. 8)."

55. "The gently sloping surface of the San Onofre Shelf is interrupted by several erosional wave cut platforms that mark former sea levels which fluctuated in response to glaciations during the Pleistocene epoch. These wave cut platforms truncate underlying strata of Miocene age and are covered by younger sediments laid down as the sea fluctuated to new levels. (Shlemon, Tr. 3189-3194; Exhibit #28, RJS-1, p. 32; Figures 6, 7). These platforms and the younger covering sediments are not displaced and their ages therefore provide a minimum date for any faulting that may have occurred in the vicinity of the San Onofre Shelf. (Moore, written testimony, pp. 9-10; SER, Section 2.5.1.12)."

56. "An analysis of the worldwide marine isotope chronology shows that there have been some 17 to 20 major fluctuations of sea level within about the last 700,000 years, caused mainly by glacial (low stand) and interglacial (high stand) alternations (Shlemon, Tr. 3190-3194; Exhibit #28, RJS-1, p. 32). A well documented high stand of sea level, referred to as substage 5e, took place about 125,000 years ago and is recorded onshore by the almost continuous, unbroken platform exposed in the seacliffs. Previous high stands of sea level are also recorded by other elevated marine platforms found throughout the Camp Pendleton area. Younger fluctuations of sea level are recorded by submerged platforms offshore San Onofre. (Shlemon, written testimony, p. 10; Tr. 3135; SER, Section 2.5.1.12)."

57. "Several submerged platforms exist on the San Onofre Shelf. The ages of these platforms range from about 5,000 years to at least 40,000 years and possibly as much as 80,000 years old. (Shlemon, written testimony, pp. 9-10, Figures RJS-A, RJS-B; SER, Section 2.5.1.12). Seismic profiles in this area show that no faults displace these platforms and that there is no deformation or faulting within the overlying covering sediments with the possible exception of an area at the northern part of the SCOF of the SCOZD. Confidence in the absence of faulting of the offshore platforms and overlying deposits is provided by the strong contrast of seismic reflectors between the younger sedimentary cover and the underlying Miocene-age rock. Nowhere east of the SCOF does displacement on the San Onofre Shelf extend upward into the Pleistocene erosional unconformity. (Moore, written testimony, pp. 21-22; SER, Section 2.5.1.12)."

58. "The terrace platforms offshore San Onofre are dated by radiocarbon of organic matter from younger covering sediments and by association with the worldwide marine isotope stage chronology. One of the platforms was probably cut during isotope stage 3 about 35,000 - 40,000 years ago, and another during a preceding high stand, possibly isotope stage 5a, about 80,000 years ago or during a minor intermediate age level. (Shlemon, written testimony, pp. 9-10, Figures RJS-A, RJS-B; Exhibit #28, RJS-1, Figures 6, 7). The older sediments covering the platforms are in the order of 20,000 to 40,000 years old. The younger sediments probably range in age from about 20,000 to 2,000 or 3,000 years old. The contact between these covering sediments is well defined on the seismic profiles. (Shlemon, Tr. 3170-3177). There is high confidence in the radiocarbon dates of 8,500 to 13,000 years for the youngest sediments covering the offshore terraces, because the dates are stratigraphically consistent and are not likely to be contaminated by younger organic matter. Although there are always some uncertainties in isotopic dating techniques, in most cases errors in the San Onofre samples favor a younger age, so that the dates obtained are minimal. (Shlemon, Tr. 3195-3197)."

59. "Radiocarbon dates and world wide sea level fluctuations (Flandrian transgression) indicate that the youngest offshore cover was deposited since the last 17,000 or 20,000 years. The underlying older cover was deposited prior to about 20,000 years ago. Conservative extrapolation suggests that the entire sequence of sediments covering the marine platforms offshore San Onofre are at least 35,000 to 40,000 years old. (Shlemon, Tr. 3182-3187)."

60. "The folds and faults of the so-called CZD have not had movement since Miocene time (Moore, written testimony, pp. 48-49). In addition, it is known that without exception the wave-cut platforms are not

displaced. (Kennedy, Tr. 2455; SER, Section 2.5.2.12). Therefore, faults of the CZD have had no movement for at least about the last 80,000 years and possibly not for several million years."

61. "Nine marine terraces were identified onshore in the San Onofre area. The Terrace 1 platform, investigated for at least 10 kilometers south to the Target Canyon area and 17 kilometers north to Dana Point, is the lowermost platform in the San Onofre onshore region and is traced almost continuously in the sea cliffs from about 10 km south of San Onofre to Target Canyon. It can be discontinuously traced northerly some 17 km to Dana Point. (Shlemon, written testimony, p. 7; Exhibit #29, RJS-2). Although there are places where streams have eroded the platform or have covered it, the platform is almost continuously exposed over this distance, and the SONGS sea cliff area is one of the best exposures on the west coast (Shlemon, Tr. 3134-3137. Excellent exposures of the sea cliff and the Stage 5c platform and 125,000 year old terrace deposits are observed unbroken from the northern end of the San Mateo flood plain north of SONGS, to south of SONGS (Shlemon, Tr. 3181)."

62. "Assurance of no displacement of the fluvial and marine terrace deposits is obtained either through direct observation or by projection of surfaces across unexposed areas. In the case of San Onofre and San Mateo Creeks, the exposures are sufficiently continuous such that resolution of vertical displacement by these methods is in the order of three to four feet. (Shlemon, Tr. 3203-3204). However, Terrace 1 is not exposed for approximately 7,200 feet north of the SONGS site where it is covered by younger fluvial materials or has been removed by erosion (Shlemon, Tr. 3137-3142). There are, however, other dateable geomorphic markers and stratigraphic units, including the San Mateo formation, to cover these minor gaps. (Shlemon, Tr. 3146; Exhibit #25, JLS-1, Drawing 2)."

63. "River terrace deposits laid down by ancestral San Mateo and San Onofre Creeks, dated at about 60,000 to 70,000 years old, have been observed in valley walls and found to be undisplaced where exposed from the coast upstream some 2 or 3 miles (Shlemon, Tr. 3143-3152). In addition, interpretation of water well logs from the lower San Mateo Creek area discloses a general continuity of buried gravels, indicating no displacement in the vicinity of the projected CZD (Shlemon, Tr. 3249). These logs show buried gravels of part of an ancient (glacial) channel of San Mateo Creek (QC-2), about 17,000 to 20,000 years old, preserved some 100 feet below sea level at the present coast line (Shlemon, Tr. 3149). The modern floodplain deposits of San Mateo and San Onofre Creeks are flanked by fluvial terrace deposits (Q 4) and related soils in the 40,000 - 60,000 year-old range, and are undisplaced (Shlemon, Tr. 3200-3202, 3204,

3162). Additionally, these deposits are well exposed in other localities adjacent to SONGS including sea cliffs, and road and railroad cuts (Shlemon, Tr. 3156-3158)."

64. "In addition to dates based on terrace development and the worldwide isotope chronology, absolute dates on sediments in the San Onofre area were derived from radiocarbon analysis, uranium-series methods, and amino-acid techniques. The age ranges for these techniques overlap sufficiently to provide confirmation of the various dates obtained. In essence, Quaternary sediments at San Onofre, both onshore and offshore, have been dated by multiple methods including geomorphic and isotopic techniques. All methods yielded generally consistent results (Shlemon, written testimony, pp. 8-10; Exhibits #28, RJS-1; #29, RJS-2; Tr. 3199-3200)."

65. "At San Onofre, Terrace 1 is overlain by about 60 feet of nonmarine deposits containing several buried paleosols, excellent stratigraphic markers to determine the age of the deposits and the last movement of any fault in the area. (Shlemon, Exhibit #28, RJS-1) Several age dating techniques demonstrated that Terrace 1 is about 125,000 years old. Terrace 1 clearly passes unbroken over the Cristianitos fault as exposed in the seacliffs (Ehlig, Tr. 1103; Shlemon, written testimony, p. 8; Shlemon, Tr. 3190-3194, 3212; Exhibit #28, RJS-1, pp. 57-109; SER, Sections 2.5.1.8, 2.5.1.12) The absolute ages of the older and higher marine terraces at San Onofre are unknown; but, based on the marine isotope stage chronology, range from about 250,000 to almost a million years old, and these terraces are also not displaced. (Shlemon, Tr. 3190-3194, 3212)."

66. "No evidence for the postulated CZD has been found onshore at San Onofre. Examination of the sea cliffs between San Mateo and San Onofre creeks and between San Onofre Creek on the north and the Cristianitos fault on the south show no faults in either the Tertiary San Mateo formation nor in overlying 125,000 year old marine terrace and approximately 60,000 year old fluvial deposits (Shlemon, written testimony, pp. 10; Exhibit #30, RJS-3, Figures 5, 5a, 6)."⁷⁸

67. "The sea cliffs and river valleys bordering San Mateo and San Onofre Creeks have also been inspected to determine if there may have been displacement of various geomorphic features and formations along any conceivable projection of the CZD. There is no deformation or displacement of the 4-10 million years old San Mateo formation nor of the younger marine and fluvial terrace deposits (Shlemon, Tr. 3204-3205). Therefore, from geomorphic expression and continuity, there is no evidence for faults or folds of the CZD extending onshore at San Onofre (Shlemon, Tr. 3208-3209)."

⁷⁸The Board adds Shlemon, Tr. 3160, 3204-3209 to this Finding.

8. Summary and Conclusions.

68. "All seismic profiles examined show that faults associated with the CZD end at or below the surface of an apparent wave-cut platform that is overlain by acoustically transparent sediment. Nowhere within the CZD is there evidence of a seafloor displacement. The CZD dies out to the north and has essentially disappeared within the area of the close-spaced Woodward-Clyde lines. Marine Advisers line S-26 farther north also shows no evidence of CZD folds, but homoclinally seaward-dipping beds. No faults of consequence extend onshore from the CZD offshore, [according] to analysis of the offshore data. (SER, p. F-8; Moore, Tr. 2969-70, 3082-83.)"

69. "The only capable fault within five miles of the SONGS site is the SCOF which is an element of the SCOZD. (Moore, written testimony, p. 49)."

70. "The onshore Cristianitos fault does not extend seaward for more than about 2,000 meters, and it does not have a connection or other structural relationship with the SCOZD. (Moore, written testimony, p. 49)."

71. "Faults on the San Onofre Shelf that nearly coincide with the onshore trend of the Cristianitos fault are confined to horizons deep within the section and do not extend into the younger Monterey formation. They cannot be related to the much younger movement on the Cristianitos fault. (Moore, written testimony, p. 49; Tr. 3079-80)."

72. "Other faults east of the SCOZD in the CZD are associated with gentle folding and are largely intraformational. Most of them do not extend deep into the section or upward to the sea floor, and they do not have the intensity or continuity of deformation comparable to the SCOF. (Moore, written testimony, p. 50)."

73. "Last displacement on faults of the CZD offshore SONGS occurred in Miocene time, about 5-6 million years ago (Moore, written testimony, pp. 45-49)."

74. "Wave-cut platforms offshore San Onofre range in age from about 5,000 to possibly 80,000 years old, based on association with the marine isotope stage chronology and on stratigraphic relationship to overlying marine sediments dated by radiocarbon. Neither the offshore platforms nor overlying sediments are displaced by the CZD (Moore, written testimony, pp. 46-47; Shlemon, written testimony, pp. 8-10; SER, Section 2.5.1.12)."

75. "The first marine terrace onshore, Terrace 1, is dated by uranium-series, amino-acid, faunal association and soil-stratigraphic techniques as about 125,000 years old (substage 5e). This terrace (platform) is an almost

continuous stratigraphic marker in the San Onofre area crossing unbroken over the Cristianitos fault as exposed in sea cliffs (Shlemon, written testimony, p. 8; Tr. 3182; SER, Sections 2.5.1.8, 2.5.1.12)."

76. "Nine older terraces onshore at San Onofre are dated by association with the marine isotope chronology, and range in age from about 250,000 to almost a million years. None of these are known to be offset. (Shlemon, Figures RJS-A, RJS-B; Exhibit #28, RJS-1, Figures 5, 6)."

77. "Fluvial terraces bordering San Onofre and San Mateo Creeks, in the order of 60,000 years old, are traceable from the coastline some 2 or 3 miles upstream. Within the resolution of field measurements these terraces are not displaced by any onshore projections of the CZD (Shlemon, Tr. 3160; Exhibit #30, RJS-3, Figures 5, 5A, 6)."

78. "No evidence has been observed for displacement of the 125,000 year old marine platform, the 60,000 year old fluvial terraces, or the underlying Tertiary bedrock (San Mateo formation), in areas adjacent to SONGS where the CZD might be projected onshore (Shlemon, written testimony, p. 10; Exhibit #30, RJS-3, Figures 5, 5A, 6)."

79. "Certain offshore features characterized as a zone of deformation and referred to as the CZD are not structurally related to either the Cristianitos fault onshore or to the SCOF offshore. (Moore, written testimony, p. 50). Therefore, neither characterization of the offshore features as a zone of deformation or any additional information about this zone of deformation which became available subsequent to the issuance of the construction permit renders the seismic design basis for SONGS 2 & 3 inadequate to protect the public health and safety."

80. We earlier raised the matter of the data voids reported by Greene and Kennedy. In consideration of the full record, we find those data voids of little significance in determining the seismic safety at San Onofre. A truly massive investigative effort was mounted by the Applicants, which has been critically reviewed by the Staff and the USGS, to explore the CZD and its relationship to the OZD and the Cristianitos fault. These studies, involving both the onshore and offshore features, have determined in a most professional fashion the geologic stratigraphy, tectonic history, and age of the critical features of interest. The record strongly supports the conclusion that the faults associated with the CZD are inactive. The Board concludes that the questions posed in Contention No. 2 have been laid to rest.

F. Small Earthquakes After the Construction Permit.

1. Trabuco Canyon Earthquakes.

The two largest earthquakes near the site since issuance of the construction permits occurred within a few minutes of each other in January 1975

several kilometers west of the Cristianitos Fault. The magnitudes of these earthquakes were M_L 3.8 and 3.3. In June and July of 1977, five small earthquakes, the largest of which was M_L 2.8, occurred in Trabuco Canyon about 2.5 km north of the 1975 events. The Applicants presented expert testimony and exhibits⁷⁹ to demonstrate that these earthquakes were not associated with the Cristianitos Fault and have no safety significance for San Onofre. (Biehler, written testimony)

2. The Applicants and the NRC Staff agreed that these small earthquakes were of no safety significance. The Intervenors presented no direct case and proposed no findings on these events. Accordingly, the findings proposed by the Applicants and Staff are uncontested.

3. Using refined velocity models, the Applicants placed the hypocenters of the two 1975 events too far west to be on the Cristianitos Fault. Moreover, these events did not have a style of faulting similar to the Cristianitos Fault. The Applicants concluded that the events appeared to be associated with a fault which parallels Trabuco Canyon. Depth estimates for both events ranged from 2 to 4 km. A field survey in the area did not locate any ground surface rupture. (SER § 2.5.1.7, 2.5.2.2; Biehler, written testimony, pp. 4-8).

4. Because of the small magnitudes of the 1977 earthquakes, there were insufficient data to determine the focal mechanisms of these events. However, there is no evidence to indicate that these small earthquakes are associated with the Cristianitos Fault or other known faults in the area. (SER § 2.5.2.2; Biehler, written testimony, pp. 8-9).

5. The Board finds on the basis of the uncontradicted evidence that these small earthquakes are unrelated to the Cristianitos Fault and have no safety significance for the San Onofre site.

2. Offshore Earthquake Swarm.

6. Between November 6 and 9, 1981, after the record in this case was closed, a swarm of small earthquakes occurred offshore about 12 km SSE of the San Onofre site. The largest earthquake detected was M_L 3.0; the swarm totaled twenty small earthquakes, including eleven in the magnitude range M_L 1.2 to 1.8. The Applicants notified the NRC Staff of

⁷⁹ Dr. Shawn Biehler, the Applicants' witness, had prepared an extensive report on the 1975 events which had been submitted to the NRC Staff. This report was admitted into evidence, without objection, as Applicants' Exhibit 31. This Exhibit includes in Figure 1 and Appendix B some earthquake data antedating issuance of the construction permits in 1973. The Intervenors pointed to this data in support of their later efforts to introduce similar data to prove the seismicity of the Cristianitos Fault. (Tr. 4602-03). The Applicants argued that their pre-1973 data was offered only to show the thoroughness of their investigations. (Tr. 4609). The Board might well have excluded the pre-1973 data if a timely objection had been made to it. In any event, we did not consider it for any purpose.

these events and thereafter filed two technical reports establishing the swarm location as accurately as possible and answering various questions about its significance. The NRC Staff notified the Board and parties of these developments and served copies of the reports. (Reports of Sierra Geophysics, Inc., about Earthquake Swarm transmitted to NRC Staff on November 18 and 30, 1981).

7. The Board thereafter issued an Order calling for comments on the swarm to determine what impact, if any, it might have on the pending decision. The parties were specifically asked to comment, among other things, on whether the Applicants' reports should be included in the record and whether the swarm constituted good cause to reopen the record for further hearings. (Board Order of December 10, 1981).

8. Comments were received from all parties. We are incorporating those comments and related papers, as described in the footnote,⁸⁰ in the record. It is unnecessary, therefore, to restate the parties' positions in any detail.

9. The basic question is whether the case should be reopened for further hearings on the possible significance of the swarm to the seismic safety of San Onofre. The only reason to consider reopening is the swarm location near the point where Greene and Kennedy have postulated a merger of the OZD and CZD. If the swarm seemed to prove, or might lead to proof, that the CZD contains significant capable faults (contrary to the findings we make in this decision) then presumably we should reopen to explore it further. But the swarm, while relevant to those questions, does not prove capability of the CZD, and there is little reason to believe that further investigation and hearings because of the swarm might lead to any better knowledge of the CZD.

10. The available evidence, although less than conclusive, indicates that the swarm was less likely to have been associated with the CZD than the OZD, an active fault where swarm activity is not unexpected. This is suggested both by the fault plane resolutions for the largest events and the strike/slip sense of motion. (Applicants' Comments, pp. 9-10 and Fig. 13.1). Moreover, these small earthquakes occurred probably five-to-eight km below the ocean floor. (Applicants' Report of November 30, 1981, p. 2). It seems unlikely that they would have caused surface ruptures of any kind, let alone ruptures large enough to be studied by additional seismic

⁸⁰ The following documents are ordered included in the record: Applicants' Reports transmitted November 18 and 30, 1981; NRC Staff Review of Applicants' Reports dated December 8, 1981; Board Order dated December 10, 1981; Comments by Intervenor (December 15), Applicants (December 21) and the Staff (December 22); Letter from Dr. Brune to the Board Chairman dated December 18, 1981. The parties divided on whether these papers should be included in the record. We include them because that will not prejudice any party and could facilitate possible appellate review of the matter.

reflection profiling. Thus it appears that no more useful information about the swarm is even potentially available. And given the fairly straightforward nature of the evidence that is available, cross-examination is unlikely to shed more light on this matter. In sum, we conclude that nothing useful would be gained and that the outcome of the proceeding would not be affected by reopening.⁸¹

IV. CONCLUSIONS OF LAW ON GEOLOGY/SEISMOLOGY ISSUES

Upon consideration of the record of the proceeding and in light of the foregoing findings and discussion, the Board concludes that, with respect to the requirements of the Atomic Energy Act of 1954, as amended, and the rules of the Commission relating to seismic and geologic siting of nuclear power plants:

(1) The geologic, seismic, and engineering characteristics of the San Onofre site and its environs have been investigated in sufficient scope and detail to provide reasonable assurance that they are sufficiently well understood to permit an adequate evaluation of the proposed site, and to provide sufficient information to support the required health and safety determinations and to permit adequate engineering solutions to actual or potential geologic and seismic effects at the plant site;

(2) Applicants have taken into account the potential effects of vibrating ground motion that could be caused by earthquakes. The design basis for the maximum vibratory ground motion and the expected vibrating ground motion have been determined through evaluation of the seismologic and geologic characteristics of the site and the surrounding region. Applicants have identified the most severe earthquakes associated with tectonic structures in the region surrounding the site. Applicants have determined the most severe earthquake that could be associated with the controlling feature at the San Onofre site — the Offshore Zone of Deformation — by considering its geologic history and other relevant factors. Applicants then have determined the vibratory ground motion at the site and have designated the earthquake which could cause the maximum vibratory ground motion as the Safe Shutdown Earthquake;

(3) Applicants have met their burden of proof with respect to each of the four geologic/seismic issues admitted into controversy in this proceeding; and

⁸¹ A Board has discretion to decline to reopen in such circumstances. *Public Service Co. of Oklahoma* (Black Fox Station), ALAB-573, 10 NRC 775, 804 (1979).

(4) From the standpoint of seismicity of the site and surrounding area, there is a reasonable assurance that San Onofre Units 2 and 3 can be operated without endangering the health and safety of the public.

V. THE LOW-POWER MOTION

A. Contentions In Issue.

When it became apparent that Unit 2 would be completed before the Board could render a decision on a full-power operating license, the Applicants filed a motion pursuant to 10 CFR 50.57(c) for an operating license authorizing fuel loading and initial low-power testing at levels not to exceed 5 percent of rated power.⁸² The motion was predicated upon a ruling in the Applicants' favor on the seismic issues (which had already been heard) and a showing to be presented concerning the relatively lower accident risks associated with low-power, compared to full-power, operations. The issue for hearing presented by the low-power motion, as formulated by the Applicants, slightly modified by the Staff, accepted by the Intervenor, and approved by the Board, was as follows:

Whether there is reasonable assurance of adequate protection to the health and safety of the public during fuel loading and low power testing, considering the risk to the public presented by those activities and the level of emergency preparedness in place during those activities.⁸³

In addition to the "comparative risk" contention quoted above, the parties were given an opportunity to propose additional contentions, subject to their making appropriate showings on the requirements for late contentions, if applicable. The Intervenor proposed two contentions, both of which were opposed by the Applicants and the Staff,⁸⁴ and one of which

⁸² Alternative Motion of Applicants' Southern California Edison Company, *et al.* for an Operating License for Fuel Loading and Low-power Testing, filed August 31, 1981.

⁸³ See Tr. 8658, 9226, 9232-33. This issue, although worded somewhat differently, is essentially similar to the issue in the Diablo Canyon low-power proceeding. See *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Plant) Partial Initial Decision of July 17, 1981, ¶ 60. See Tr. 8462. This contention, theoretically, at least, incorporated the Intervenor's emergency planning contentions (as required by 10 CFR 50.57(c)) "to the extent [they] are relevant to the activity to be authorized" — i.e., low-power testing. However, the Intervenor's contentions were focused almost exclusively on the off-site emergency plans. (These contentions are set forth at pp. 1-3 of the NRC Staff's Proposed Findings of Fact of October 29, 1981.) As demonstrated at the hearing, the adequacy of off-site plans is at most a secondary concern in low-power testing.

⁸⁴ Intervenor's letter to the Board Chairman, dated September 9, 1981; Memorandum of Points and Authorities, dated September 14, 1981; Applicants' Memorandum in Opposition to Intervenor's Issues, dated September 18, 1981; NRC Staff's Response to Intervenor's Issues, dated September 18, 1981.

they subsequently withdrew.⁸⁵ The other proposed issue was:

Whether Applicants have sufficiently demonstrated that a radiological emergency at SONGS 2 and 3 could not cause a radiological emergency at SONGS 1.

This contention was opposed on various grounds, including untimeliness and a lack of sufficient specificity. As to the latter, the Intervenor's memorandum in support of this vague contention was premised exclusively on alleged "connections" between Units 2 or 3 and operating Unit 1, such that an accident in one might cause a "simultaneous emergency" in another.⁸⁶ The record as later developed indicated that the units were not interconnected in such a fashion,⁸⁷ and the Intervenor apparently now concedes at least the lack of any physical interconnection.⁸⁸

Apart from physical interconnection, the Applicants suggested without contradiction that under the previously admitted comparative risk issue, questions about the adequacy of personnel at the site for low-power testing, and whether they might have conflicting duties at the other units, would be proper.⁸⁹ Beyond these areas, however, neither the sponsoring Intervenor nor anyone else was able to clarify this vague contention.⁹⁰

On the question of timeliness, the Intervenor argued that their contention was not "new," and therefore that it was not subject to the tests applicable to late-filed contentions. In their view, their contentions related to the "risk probability calculus of low-power" and therefore should be considered a "sub-part" of the admitted issue.⁹¹ It is undeniable, however, that the concept of the operations at Units 1 and 3 somehow affecting emergency preparedness at Unit 2 was raised for the first time by this proposed contention.

We thereafter ruled orally on the record, rejecting the Intervenor's proposed contention, primarily for lack of the specificity required by 10 CFR 2.714(b).⁹² The Board noted that "the low-power motion context is not a free opportunity to bring in new contentions. Rather, parties have to satisfy the requirements of contentions generally . . . and certain other

⁸⁵ See Tr. 9972-73.

⁸⁶ Intervenor's Memorandum of Points and Authorities, dated September 14, 1981, p. 4.

⁸⁷ Affidavit of Harry Rood, the NRC Staff Project Manager, attached to NRC Staff's Response, dated September 18, 1981; Tr. 9953-54.

⁸⁸ See Memorandum cited in note 84, *supra*.

⁸⁹ Tr. 9953.

⁹⁰ Tr. 9955-56, 9960-61.

⁹¹ Tr. 9956-59.

⁹² Tr. 10,099-100. The reference in the record was inadvertently to the particularity requirement in 10 CFR 2.714(a), which speaks primarily to standing. Subsection (b) speaks to contentions, and requires that their bases be set forth with "reasonable specificity." The concepts of particularity and specificity are, of course, similar. In any event, the rationale of our ruling is clearly expressed in the record.

requirements that apply to late-filed contentions.”⁹³ The Board further held that the requirements of specificity become more stringent where, as here, a new contention is proffered at the eleventh hour.⁹⁴ Applying that standard here, we found that:

We really don't know what the [interconnection] contention does envision, and we think that it is therefore unfair to the Applicant to admit it, because there isn't any very clear indication of what it is they are supposed to respond to.

In their “Brief on Proposed Findings of Fact . . . [on] Low Power Testing” the Intervenor seek, in effect, to reargue the exclusion of this contention, urging that “any study of the risk of operation of Unit 2 at low power must address whether . . . risks would be increased by (1) the continued construction of Unit 3 and (2) the ongoing operation of Unit 1.” Brief at p. 6. We are now told that there are “certain interrelationships between [Units 1 and 2] which could multiply the risk of operation of Unit 2 at low power.” *Id.*, p. 7. By way of specifics, Intervenor note, for example, that both units use the “same fire water system and switching system.” These facts were before the Board when it heard argument on the Intervenor's contention; yet they apparently saw no safety significance in them at that time.⁹⁵ In addition, the Intervenor point out that the emergency plans for Units 1 and 2 are similar, and that some of the emergency personnel would have responsibilities for both units. *Id.* The record supports these facts. Indeed, it would be anomalous if there were not similarities in plans for different units on the same site and if some management level personnel did not have duties at all three units. The record also shows that the Intervenor were allowed to and did cross-

⁹³ Tr. 10,099.

⁹⁴ The Board reasoned that:

We think it important to note in this connection that some of these requirements, in our view, become more stringent as the case progresses. Otherwise, admission of contentions under looser standards would, we think, delay cases and unduly prejudice the Applicants. Specifically, 10 CFR 2.714(a) requires that a proposed contention be set forth with particularity. We think this is a requirement that becomes more stringent with the passage of time and the progress of the case. Because you at this late stage don't have the discovery process in which to develop information and refine a contention, nor do you have the pre-trial negotiation phase to refine contentions, so that when you come in at the eleventh hour, and this is at least the eleventh hour in this hearing, we think you need a very clear and very specific contention in order to satisfy particularity requirements. Tr. 10,099-100.

⁹⁵ Tr. 9953. This information was contained in the affidavit of Project Manager Rood; see note 87, *supra*.

examine in these areas, and that cross-examination did not reveal any significant safety concerns.⁹⁶

The Intervenor claim, for the first time, that "Unit 3 is interconnected with Unit 2." (Emphasis in the original.) It is alleged, without specification, that there are "numerous interconnected systems including control room between Unit 2 and Unit 3." *Id.* It is the Board's understanding, based upon a site visit and direct observation, that the control rooms for Units 2 and 3 are adjacent to, but essentially independent of, one another. Except for the Intervenor's unsupported assertion about the control rooms, we are left to speculate about the nature of these alleged "interconnections" and their significance to low-power operations.

The Intervenor also claim that ongoing construction at Unit 3 "could increase the risk of an accident at Unit 2." That proposition is hardly self-demonstrating, and the Intervenor offer no demonstration.

The time for advancing specifics about alleged safety relationships among the three units was when we called for proposed contentions on the low-power motion. We are not obliged at this juncture even to consider these *post hoc* and largely unsupported justifications for the vague contention we earlier rejected. Nevertheless we have given these belated arguments some consideration and find nothing in them to cause us to reconsider our decision.

B. Comparative Risks — Low Power Versus Full Power.

The NRC Staff called two expert witnesses, Mr. G. Norman Lauben and Dr. Patrick D. O'Reilly, on the technical aspects of the comparative risks issue. They focused on the significant postulated accidents that could occur at San Onofre Unit 2 and which could affect public health or safety. They testified that

there are three major factors which contribute to a substantial reduction in risk for low-power testing as compared to continuous full-power operation. First, there is additional time available for the operators to correct the loss of important safety systems needed to mitigate relatively high risk events, or to take alternate courses of action. Secondly, the fission product inventory during this time would be very much less than during full-power operation. Third, there is a reduction in required capacity for mitigating systems at low power.⁹⁷

⁹⁶ Tr. 11,252-58. The Intervenor also state that the "operating personnel for the two units are the same." *Id.*, p. 7. The page of the record cited in support of this statement does not support it; it seems unlikely that the statement is accurate.

⁹⁷ Lauben/O'Reilly Testimony, p. 2.

The NRC witnesses identified the postulated accidents which are the dominant risk contributors at San Onofre. With reference to those kinds of accidents, the NRC Staff performed a plant-specific relative risk analysis which determined the reduction in risk of public exposure for low-power operation, taking into account the additional time available for reactor operators to take corrective actions and the reduced fission product inventory for operation at 5% power for up to six months. For this analysis the overall reduction in risk to the public was found to be 500 to 10,000 as compared to continuous full-power operation.⁹⁸

Mr. Lauben and Dr. O'Reilly testified in some detail about the significance of the increased time that would be available to operators at low power to diagnose and take corrective actions for several possible accidents at San Onofre. For example, their analyses showed that, at low power, for a very unlikely large break loss-of-coolant accident, coupled with emergency core cooling system failure, there would be a minimum of fifteen hours to take effective remedial action.⁹⁹ More credible accidents could be expected to involve substantially longer remedial action times.

The Applicants presented a technical witness on the comparative risk question, Mr. David Buttemer.¹⁰⁰ His testimony was along much the same lines as the Staff witnesses — that the much lower core fission product inventories present at low power and the resulting slower heat-up rates would provide more than ample time for corrective action. The NRC Staff witnesses were critical of Mr. Buttemer's analyses in several respects, notably in his selections of accident scenarios and in certain of the assumptions he adopted.¹⁰¹ The Staff testified, however, that despite their differences in approach, Mr. Buttemer's results would be "comparable" to theirs, and that the conclusions under both approaches were "similar."¹⁰²

The Intervenor did not present any direct case on the low-power motion. Their cross-examination did not significantly undercut the Staff and Applicants' presentations on comparative risk.

In their post-hearing submission, the Intervenor complain that the comparative risk assessments in the hearing were "generic" and that a "site-specific" analysis of "actual risk" is required for low-power operations. This argument rests in part on alleged risks posed by Units 1 and 3; we have already explained why such matters were not properly considered. Beyond that, however, the Staff's analysis was not based on wholly generic factors. Rather, they focused on operations of a Combustion

⁹⁸ *Id.*, p. 3; Tr. 11,326-27, 11,336-37.

⁹⁹ Lauben/O'Reilly Testimony, pp. 5-6; Tr. 11,317, 11,330-31).

¹⁰⁰ Tr. 11,198, et seq. Mr. Buttemer's calculations were contained in an exhibit, A. Ex. 161.

¹⁰¹ Tr. 11,323-24.

¹⁰² Tr. 11,335-36.

Engineering pressurized water reactor, including certain engineering features specific to San Onofre, Unit 2.¹⁰³ In addition, our conclusions on risk are based in part on the nature and duration of the activities that will actually take place under the low-power license. To be sure, the hearing did not address site-specific *consequences* of accidents, normally a component of risk analysis. But there was no need to look at consequences in the circumstances of this case. As will be shown, the emergency plan for the site will meet all requirements for full-power operations. Those requirements already incorporate consideration of the worst credible accidents that could endanger workers on-site at San Onofre. As to protection of the public off-site, the evidence shows that potential off-site consequences from low-power operations do not require *any* advance emergency planning.¹⁰⁴

We see no need to describe in any greater detail the technical presentations on comparative risk. The Commission itself recently endorsed the general proposition that fuel loading and low-power testing —

involve minimal risk to the public health and safety, in view of the limited power level and correspondingly limited amounts of fission products and decay heat, and greater time available to take any necessary corrective action in the event of an accident.¹⁰⁵

The Staff's technical presentation in this case reflected substantial research and amply demonstrated the applicability of the Commission's statements to San Onofre Unit 2. Specifically, we find that even in the case of the most serious (and extremely unlikely) postulated accident, there would be some fifteen hours available for diagnostic and mitigative actions before core melt would occur.¹⁰⁶ More time would be available for more credible events. In addition, the fission product inventories produced by low-power operations of limited duration are a fraction of those produced at full power. Furthermore, the capacity required for heat removal is reduced at low power. On the basis of these factors, we conclude that low-power operations of Unit 2 at San Onofre, as proposed by the Applicants, will involve substantially less risk to the public health and safety than full power operations.

¹⁰³ Tr. at 11,336-37.

¹⁰⁴ Some consequence analyses might conceivably be necessary if some lesser, but still significant, risks were posed to the public off-site and off-site plans were incomplete. Such analysis might produce some less stringent set of standards for low-power operations.

¹⁰⁵ Supplementary information accompanying adoption of final rule concerning Commission effectiveness review prior to fuel loading. 46 Fed. Reg. 47764, 47765.

¹⁰⁶ This section of our decision does not contain separately numbered findings of fact. The findings are incorporated in the decision.

C. Applicants' Plans for Low-Power Operations and Emergency Preparedness in Place.

The Applicants presented a single witness, Mr. David Pilmer, on this subject. He testified that the on-site emergency plans for Units 2 and 3 would be fully implemented before fuel loading.¹⁰⁷ He noted that a recent inspection of the emergency plan for Unit 1 had found no items of noncompliance. While the operating personnel for Unit 2 are different, this recent inspection is relevant to the state of readiness for Unit 2, because the key on-site management, supervisory and senior technical personnel that represent much of the on-site emergency response capability are responsible for both units.¹⁰⁸

Mr. Pilmer testified that the planning required for emergencies with offsite consequences during fuel loading and low-power operations depended upon the activities to be conducted. It is estimated that initial criticality will occur about the eleventh week of the sixteen week fuel-loading and testing program. Prior to criticality, the risk of significant releases of radiation is essentially zero. During the first three weeks of criticality, fission product generation is low. This means that a significant fraction of the fission product would have to be released to the atmosphere — i.e., a core melt — to result in significant off-site doses. A core melt is not possible during these activities because of the limited decay heat generation associated with operation at less than 1 percent of rated power.¹⁰⁹ Mr. Pilmer concluded from these considerations that "There can not exist a set of conditions that could constitute a General Emergency . . ." i.e., one threatening the public offsite, during the first fourteen weeks of fuel loading and testing.

The final two weeks of proposed testing require reactor power levels between 3-5 per cent. Mr. Pilmer testified that —

For the first time the reactor will accumulate sufficient quantities of fission products such that a Class-9 accident sequence, although highly improbable, would be possible . . . The necessity for taking protective actions offsite could arise . . . With a time period on the order of a day or so for a Class-9 accident sequence to develop to the point of generating the radionuclide release, minimal offsite planning should be sufficient.

¹⁰⁷ Pilmer Testimony, p. 1, following Tr. 11,243. Mr. Pilmer is Supervisor of the Health Physics and Emergency Planning Group of the Southern California Edison Co.'s Nuclear Engineering and Safety Section. The Board was impressed with his knowledgeable presentation.

¹⁰⁸ *Id.* pp. 2-3.

¹⁰⁹ Pilmer Testimony, p. 4.

Mr. Pilmer was asked "what would be the minimum state of preparedness to adequately protect public safety in the event of an accident during the low power testing program?."

He testified that —

The onsite organization should have received the training and otherwise be properly qualified to carry out all of its responsibilities set forth in the Emergency Plan for SONGS Units 2 & 3. As a minimum, the means to communicate with offsite authorities is required in the event the accident may produce offsite consequences. However, because of the length of time available, offsite authorities for SONGS are well able to carry out any recommended protective actions even without further detailed procedures or special training.

Mr. Pilmer's view concerning the need for "means to communicate with off-site authorities" in the event of a serious accident was shared by Mr. Brian Grimes, Director of the NRC's Division of Emergency Preparedness.¹¹⁰ The Board agrees that this capability is necessary. We turn in this connection to the record developed by the Applicants in their affirmative case on emergency planning. One of the contentions is whether there will be adequate "procedures for notification by Applicants of State and local response organizations."¹¹¹ The Applicants' witness on this point was Mr. Harold Ray, Station Manager at San Onofre. Mr. Ray testified in detail concerning both the procedures for emergency communications (e.g., different messages for different alert levels, who calls whom, etc.) and available means of communication.¹¹² As to the latter, he testified that —

The SONGS 2 and 3 communications system includes multiple systems and redundancies which ensure the performance of vital functions in transmitting and receiving information between SONGS and involved Federal, State and local response organizations throughout the course of an emergency. These systems include the following:

- a regular public telephone system;
- a dedicated public telephone system (The Interagency Telephone System);
- a VHF radio system to Camp Pendleton Marine Corps Base;
- a UHF radio system to the Pendleton Coast Office of the State Department Parks and Recreation; and

¹¹⁰ Tr. 11,355.

¹¹¹ Contention 2A.

¹¹² Ray Testimony, pp. 16-31.

— a microwave multiplex system to the SCE Energy Control Center and the San Diego Gas & Electric Company Energy Control Center (PAX System).

This testimony was not impeached on cross-examination, nor was any contrary testimony introduced by any other party on this subject. The record clearly establishes, therefore, that the Applicants have sufficient means for notifying off-site response organizations in the event of a serious accident during low-power operations.¹¹³

D. Criteria for Emergency Plans at Low Power.

Mr. Pilmer's testimony indicated simple criteria for low-power operations: an on-site plan that meets¹¹⁴ current emergency planning requirements, plus the ability to communicate off-site. No off-site planning would be required. Unfortunately, due to the rather convoluted development of emergency planning requirements since the Three Mile Island accident, the question of the proper criteria for emergency planning at low power was a murky one, at least at the time this motion was heard.

To begin with, the present rule itself does not provide separate and less stringent standards for low-power operations. It does include, however, an "escape clause" under which applicants are given an opportunity to demonstrate that a failure to meet otherwise applicable standards is "not significant for the plant in question . . . or that there are other compelling reasons to permit plant operations." 10 CFR 50.47(c)(1). We believe that this broad language encompasses the low-power situation, authorizing exemptions from at least some of the full-power planning requirements upon an appropriate showing. But the rule does not tell us what an appropriate showing is.

¹¹³Decisions on the adequacy of emergency planning for full-power operations will be made at a later date, in the light of the parties' proposed findings of fact and conclusions of law. The existence of a nearly complete record on those issues is, however, a helpful backdrop against which to decide this low-power motion. Without intimating any decision on those full-power issues, it is relevant to the low-power question, that, as evidenced by that record taken as a whole, the emergency plans for the off-site areas are far developed. On this narrow question of the adequacy of communications equipment, we think it is appropriate to resort to the record. We made it clear to the parties that we considered the entire emergency planning record to be before us, as necessary, in deciding the low-power motion. Tr. 11,276.

¹¹⁴Arguably, one might exempt an Applicant from on-site requirements that are irrelevant to low-power. We need not reach that question here, because the Applicants meet all current onsite requirements. See p. 195, *infra*.

In early 1980, prior to the adoption of the new emergency planning requirements, the NRC Staff and the Federal Emergency Management Agency ("FEMA") saw the need for a separate approach to low-power operations when it became evident that some facilities (like San Onofre) would be ready for low-power operations before full-power emergency plans could be developed and put through the hearing process. They considered it unnecessary to develop specific low-power testing criteria, "in view of the minimal nature of the potential hazard."¹¹⁵ They accordingly agreed that, as to off-site preparedness to be evaluated by FEMA, it would be sufficient if the facility "is located in a State which had received a concurrence under the previously voluntary concurrence program administered by the NRC and based on evaluation by a multi-agency Federal Regional Advisory Committee."¹¹⁶ The Staff, in evaluating onsite preparedness, would apply then existing Appendix E to 10 CFR Part 50, and Regulatory Guide 1.101.

Following the effectiveness of the upgraded emergency planning requirements in late 1980, the NRC Staff began to apply the new rule, and the NRC/FEMA implementations of the rule in NUREG-0654, to determine the adequacy of onsite plans for low-power operations. The Staff's current approach is to determine whether a plan meets the criteria of NUREG-0654 and, if there are any deficiencies, whether those deficiencies are significant for low-power operations.¹¹⁷

The Commission has not taken a final position on which of these criteria should be applied. However, following the closing of the record in this case, the Commission proposed an amendment to the emergency planning rule under which no NRC or FEMA review concerning the adequacy of off-site emergency plans would be a prerequisite to issuance of a low-power license. The amendment contemplates that the NRC review of the on-site plan will include an assessment of off-site elements, such as communications, necessary to evaluate the Applicants' response mechanism. Any deficiencies found in the on-site plans would then be evaluated to determine their significance to low-power operation.¹¹⁸ The approach the Commission has now proposed is fully consistent with the approach we

¹¹⁵ FEMA/NRC Steering Committee Memorandum, dated March 6, 1980, Exhibit A attached to Testimony of John Sears. The decision might also have been influenced by the presumably temporary nature of the problem. When the licensing system is functioning on schedule, one would normally expect full-power emergency plans to be developed and approved well before a facility is ready for low-power operations.

¹¹⁶ "FEMA/NRC Interim Agreement on Criteria for Low Power Testing at New Commercial Nuclear Facilities," Exhibit B attached to Testimony of John Sears, following Tr. 11,340.

¹¹⁷ Sears testimony, pp. 2-4; Tr. 11,342, 11353.

¹¹⁸ See Notice of Proposed Rulemaking Concerning Emergency Planning, dated December 10, 1981, 46 Fed. Reg. 61132.

would have adopted on this record in any case. But as we shall now see, the state of emergency planning in this case satisfies not only the proposed Commission standard, but also any other reasonable standard that might be suggested.

E. Federal Agency Reviews of Emergency Plans.

1. NRC Reviews.

The NRC's initial review of the Applicants' on-site plan was conducted against the newly upgraded requirements in 10 CFR 50.47(a) and the implementing standards in NUREG-0654, on the assumption of full-power operations. The review is described in the Staff's Safety Evaluation Report and Supplements thereto.¹¹⁹ The Staff concluded that "the San Onofre onsite emergency plan provides . . . an acceptable state of emergency preparedness."¹²⁰

The Staff called two witnesses at the hearing on low power, Brian Grimes and John Sears, to sponsor the SER in relevant respects and to confirm the ineluctable conclusion that a plan adequate for full-power operations would also be adequate for low-power operations. Mr. Sears reconfirmed the conclusion that the on-site plan for San Onofre fully meets the requirements of 10 CFR 50.47(a) and the standards in NUREG-0654.¹²¹ He further testified that the plan meets the criteria of former Appendix E, pursuant to the 1980 agreement with FEMA on evaluation of plans for low-power operations.¹²² Taking note of the FEMA conclusion concerning the status of the State plan (discussed below), Mr. Sears testified that "the overall state of emergency preparedness for SONGS 2 and 3 is adequate" for low-power operations.¹²³

Mr. Grimes also testified that the present level of both on-site and off-site emergency preparedness at San Onofre is adequate for low-power operations. With respect to necessary planning levels in off-site areas, he expressed the view that —

because of the extended time periods available for ad hoc actions in the off-site areas . . . no particular pre-planning is required

¹¹⁹ SER §13.3; Supp. I, pp. 22-126-135; Supp. 3 §13.3.

¹²⁰ Supp. 3 at p. 13-4.

¹²¹ Sears Testimony, p. 4 following Tr. at 11,340.

¹²² Sears Testimony, p. 6.

¹²³ Sears testimony, p. 7. Mr. Sears also expressed the opinion that certain off-site planning deficiencies previously identified by FEMA did not affect his conclusion about the adequacy of preparedness for low-power testing. Testimony, p. 7. We do not reach these questions because we credit the testimony that no advance planning for off-site areas is necessary. See Lauben and O'Reilly, written testimony, p. 9, following Tr. 11,319; Grimes, Tr. 11,343.

off-site except for the ability to communicate with off-site authorities.

Mr. Grimes went on to add, however, that there would almost necessarily be substantial off-site preparedness in place when an applicant sought low-power operating authority only a short time before planned full-power operations. In that connection, he observed that —

Indeed, that is the case for the San Onofre facility and we believe there are substantial preparedness capabilities exhibited by the off-site authorities.¹²⁴

2. FEMA Review.

The FEMA position supporting low-power testing at San Onofre was first set forth in a July 1981 memorandum to NRC.¹²⁵ FEMA noted first that, as of that time, off-site planning for San Onofre was not, in their opinion, adequate for full power operations. However, pursuant to the 1980 agreement with NRC, FEMA took the position that low-power operations should be allowed because the California State plan had received concurrence under the prior review program. The Staff called a witness from FEMA, Mr. Kenneth Nauman, who testified that the July 1981 memorandum accurately reflected the FEMA position.¹²⁶

F. Summary and Conclusions.

The risks associated with fuel loading and low-power testing as proposed for Unit 2 at San Onofre are a small fraction of the risks associated with full power operations. The more credible low-power risks could affect workers at the site, but not the general public off-site. Primarily because of the long lead times between initiation of an accident and possible releases of radiation off-site, there is no need for advance off-site planning.

The most appropriate criteria for testing the adequacy of emergency planning for low-power operations are whether the on-site plan meets relevant full-power requirements (forgiving any deficiencies that are insignificant to low power), plus the ability to communicate with off-site authorities. Unit 2 not only meets but exceeds these tests.¹²⁷ We conclude that

¹²⁴ Tr. p. 11,341-343.

¹²⁵ Memorandum from Robert Jaske to Brian Grimes dated July 17, 1981, S. Ex. 13.

¹²⁶ Tr. p. 11,305.

¹²⁷ The on-site plan meets all full-power requirements. In addition, we take into account in this context the record demonstrating that off-site planning is substantial, encompassing matters well beyond the minimum required ability to communicate.

there is a reasonable assurance of adequate protection of the public during the fuel loading and low-power testing proposed by the Applicants. This protection is at least equal to that which will obtain at full power operations upon full compliance with the regulations. We hold, therefore, that the Applicants have demonstrated that any present "deficiencies in the off-site plans are not significant for the plant in question . . . 10 CFR 50.47(c)(1).

In light of this Partial Initial Decision and the underlying record, the Board further concludes that, to the extent relevant to the matters in controversy, Unit 2 will operate in conformity with the application, the provisions of the Act, and the rules of the Commission; that there is reasonable assurance (i) that the activities authorized by the low-power license can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the rules of the Commission, and (iii) that issuance of the license will not be inimical to the health and safety of the public.

VI. ORDER

IT IS HEREBY ORDERED, pursuant to the Atomic Energy Act of 1954 and the Commission's rules, and based upon the findings and conclusions set forth herein, that the Director of Nuclear Reactor Regulation is authorized, upon making the findings on all other matters specified in 10 CFR § 50.57(a), to issue to Applicants Southern California Edison Company, San Diego Gas & Electric Company, City of Anaheim, California, and City of Riverside, California, a license to authorize the loading of fuel and low-power testing (up to 5 percent of rated power) for Unit 2 of the San Onofre Nuclear Generating Station.

This Order is subject to the following conditions: that the Emergency Plan for Units 2 and 3 (A. Ex. 51) will be in effect prior to the first fuel loading activities, including complete implementing procedures and accomplishment of all required training. Satisfaction of this condition shall be evidenced by an NRC inspection and report to the Board. If any deficiencies are found, the report shall include an assessment of their significance to the activities authorized by this Order.

This Order is effective immediately.¹²⁸

**ATOMIC SAFETY AND
LICENSING BOARD**

**James L. Kelley, Chairman
ADMINISTRATIVE JUDGE**

**Dr. Cadet H. Hand, Jr.
ADMINISTRATIVE JUDGE**

**Mrs. Elizabeth B. Johnson
ADMINISTRATIVE JUDGE**

Dated at Bethesda, Maryland,
this 11th day of January, 1982.

¹²⁸Appendix C to the Staff's SER addresses the status of unresolved safety issues, as required by the Appeal Board's decision in *Virginia Electric and Power Co. (North Anna Station)*, 8 NRC 245 (1978). The Staff discusses in some detail a number of such issues that are applicable to San Onofre Units 2 and 3, and explains why the licensing of those units to operate should be allowed before a generic solution to the problem is found. We have reviewed these Staff explanations and find them to be adequate.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Robert M. Lazo, Chairman
Dr. Peter A. Morris
Dr. Cadet H. Hand, Jr.

In the Matter of

Docket No. 50-309-OLA

**MAINE YANKEE ATOMIC POWER
COMPANY**

(Maine Yankee Atomic Power
Station)

January 22, 1982

The Licensing Board denies a petition for leave to intervene filed almost two years after the date of the original notice of opportunity for intervention and over five months after the filing date set forth in the supplemental notice of opportunity for intervention. Petitioner's request to make a limited appearance is granted.

**RULES OF PRACTICE: INTERVENTION PETITIONS
(TIMELINESS)**

In order to gain admission into a proceeding a late intervention petitioner must address five pertinent factors in 10 CFR §2.714(a)(1), and affirmatively demonstrate that on balance, they favor such admission.

**RULES OF PRACTICE: INTERVENTION PETITIONS (PLEADING
REQUIREMENTS)**

The Commission's Rules of Practice (10 CFR §2.714) require that a petition for leave to intervene "shall set forth with particularity the interest of the petitioner in the proceeding, and how that interest may be affected by the results of the proceeding."

RULES OF PRACTICE: INTERVENTION PETITIONS (PLEADING REQUIREMENTS)

Under 10 CFR §2.714(b), an intervention petition must include the bases for each contention set forth with reasonable specificity. Contentions must be sufficiently detailed and specific to demonstrate that the issues raised are admissible and that further inquiry is warranted, and to put the other parties on notice as to what they will have to defend against or oppose.

MEMORANDUM AND ORDER (Regarding Petition for Leave to Intervene Filed by David Colton-Manheim)

During the prehearing conference on August 11, 1981, almost two years after the date of the original notice of opportunity for intervention in the above-identified proceeding¹, and over five months after the filing date set forth in the supplemental notice of opportunity for intervention², David Colton-Manheim (Petitioner) submitted to the Board a hand-delivered document entitled, "Written Petition For Leave To Intervene by The Down East Alliance, in the person of David Colton-Manheim," dated August 11, 1981 (Petition).

Attached to this Petition are an undated letter from Mr. Colton-Manheim to Judge Hand and a copy of an NRC News Release dated July 27, 1981, regarding the scheduling of the August 11, 1981 prehearing conference.

Since that time, Petitioner has supplemented his Petition with (1) a one-page, untitled pleading dated August 29, 1981 which sets forth "A Specific Contention"; (2) a nine-page letter dated September 10, 1981, addressed to the Board Chairman,³ (3) a one-page pleading entitled, "Objection & Appeal" dated September 21, 1981; and (4) a three-page untitled, undated, document mailed on November 23, 1981 from Gouldsboro, Maine which, among other things, requests the Board to schedule another prehearing conference. Licensee and NRC Staff have filed responses urging the Board not to grant the Petition. We agree that the Petition must be denied.

¹ 44 F.R. 61273 (October 24, 1979).

² 46 F.R. 9315 (January 28, 1981).

³ At the direction of the Board Chairman, Mr. Colton-Manheim's letter was served on the other Board members and all parties to the proceeding.

I.

A. In order to gain admission into a proceeding, a late intervention petitioner must address the five pertinent factors in 10 CFR §2.714(a)(1), and affirmatively demonstrate that on balance, they favor such admission. *Duke Power Co.* (Perkins Nuclear Station Units 1, 2 and 3), ALAB-615, 12 NRC 350, 352 (1980). That section provides that nontimely filings will not be entertained absent a determination that the petition should be granted based upon a balancing of the following factors in addition to those set out in paragraph (d) of §2.714:

- (i) Good cause, if any, for failure to file on time.
- (ii) The availability of other means whereby the petitioner's interest will be protected.
- (iii) The extent to which the petitioner's participation may reasonably be expected to assist in developing a sound record.
- (iv) The extent to which the petitioner's interest will be represented by existing parties.
- (v) The extent to which the petitioner's participation will broaden the issues or delay the proceeding.

Whether there is good cause for the filing delay is most important in every consideration of whether to grant a late intervention petition. Where no good excuse is tendered for the tardiness, a petitioner's demonstration on the other factors must be particularly strong. *Duke Power Company* (Perkins Nuclear Station, Units 1, 2 and 3), ALAB-431, 6 NRC 460, 462 (1977).

Several reasons are alleged by Petitioner as good cause for failure to file on time. These include: 1) that Petitioner was not informed of the proceeding (Petition, at 1); 2) that the Petitioner's hand-written note to Judge Hand and reference to the NRC News Release (attached to the Petition) in itself is good cause (*Id.* at 1); and 3) that Petitioner requested information from Karl Abraham of the NRC Office of Public Affairs, Region I at some time "before TMI" (*Id.* at 2).

As indicated, *infra*, opportunity for intervention was twice noticed in the *Federal Register*. Failure to read the *Federal Register* does not justify the nontimely filing of a petition for leave to intervene. *Long Island Lighting Company* (Jamesport Nuclear Power Station, Units 1 and 2), ALAB-292, 2 NRC 631, 646-47 (1975); and *New England Power and Light Company* (NEP, Units 1 and 2), 7 NRC 932, 933-34 (1978).

The fact that the Petitioner requested information from the NRC regional office, submitted a letter to Judge Hand and referenced the NRC News Release, does not establish that the Petitioner exercised due diligence to appraise himself of the proposed amendment and file a petition in accordance with the requirements of 10 CFR §2.714. These requirements were summarized in the above cited *Federal Register* Notices. None of the

reasons cited by the Petitioner indicate that he was diligent in discovering or exercising his rights.

In his pleading dated August 29, 1981, the Petitioner asserts "poverty" as an additional reason for good cause for the late filing of the Petition. No explanation how poverty caused the late filing is provided. However, in the document mailed on November 23, 1981, Petitioner notes that he cannot afford The Congressional Record, 10 CFR or the Federal Register, cannot afford postage, and has had "to forego access to the depository in Wiscasset." Such explanation, in view of the numerous pleadings filed since, does not amount to a substantial reason for not having filed the Petition at an earlier date. Accordingly, the assertion of poverty as an additional reason for good cause for the late filing of the Petition must fail.

Regarding the second factor to be considered, the Petition fails to show that the Petitioner has no other means to protect his interest or the interests of the organization he purportedly represents.⁴ Petitioner's interest could be protected by permitting him to make a limited appearance statement pursuant to 10 CFR §2.715(a). See, *Tennessee Valley Authority* (Browns Ferry Units 1 and 2), ALAB-341, 4 NRC 95, 96 (1976). Petitioner is also free to furnish financial, technical or legal assistance to another Intervenor. *Virginia Electric Power Company* (North Anna, Units 1 and 2), ALAB-289, 2 NRC 395, 399 (1975). Accordingly, the Board will grant Petitioner's request (pleading dated August 29, 1981) to make a limited appearance statement pursuant to the provisions of 10 CFR §2.715.

The third factor, the extent to which Petitioner can assist in developing a sound record, also weighs against permitting late intervention. Petitioner has not indicated any special expertise which would aid in the development of a sound record. See *Cincinnati Gas and Electric Co.* (William H. Zimmer Nuclear Station), LBP-80-14, 11 NRC 570, 576 (1980). An examination of the petition shows it unlikely that any special expertise to help in reaching an informed decision could be supplied by the Petitioner.

Consideration of the fourth factor, the extent to which the Petitioner's interest will be represented by existing parties, and the fifth factor, the extent to which Petitioner's participation will broaden the issues or delay the proceeding, do not result in a decision favorable to the Petitioner.

⁴ Petitioner gives no indication of his relationship to Down East Alliance let alone its membership. Further, there is no indication in the Petition that the Petitioner has been authorized to act for Down East Alliance.

Petitioner does note in his letter to Judge Hand three areas of concern without much explanation. They are: 1) "Not accident 'false design'"; 2) 'Moth ball' 'Placement Into Pressure Safe Storage (economic as well as other reasons)'; and 3) "sabotage". It cannot be judged whether this list of concerns would be encompassed in the contentions raised by Sensible Maine Power or the State of Maine.

The single contention identified by the Petitioner in the Amendment of August 29, 1981, states:

Mothball (Placement Into Passive Safe Storage) Maine Yankee now (A.S.A.P.) allowing for reopening (operation) later, even after 2008 (end of licensed period), denying thereby both the need for, and the application of, applicant for spent fuel compaction; but not to deny the possibility of recycling, even on site, through migration of the radionuclides which should be studied both as to the danger of inadvertent criticality and its possible useful employment.

This contention is vague and unspecific and completely fails to meet the contention requirements of 10 CFR §2.714. The language of the contention is so unspecific that the parties cannot know what they would have to defend against or oppose. Further, the contention is totally devoid of any basis. Moreover, the contention is so vague that it cannot be determined whether or not the contention falls within the scope of the issues set forth in the Notice of Hearing.

Finally, to the extent that the Petitioner is contending that the plant be "mothballed" until the year 2008 to avoid the need for the requested expansion, he is seeking relitigation of a matter that was resolved when the forty-year operating license was issued. At that time, the impact from the total waste which Maine Yankee would produce during the full term of its license was considered and found acceptable.

In his nine-page letter dated September 10, 1981, Petitioner refers to a "threatening note" found in a security area at the Maine Yankee plant which was reported in the Bangor Daily News on July 31, 1981. Petitioner asserts that "the existing parties do not include it" (page 5), but has not advanced a contention relating to the matter in support of any argument that his interest will not be represented by existing parties.

The Board has carefully studied the various pleadings filed by the petitioner including the document mailed on November 23, 1981 in which Petitioner notes that he has addressed the five-factors (pages 2 and 3).

On balance, it is manifestly evident that consideration of the five factors weigh against acceptance of the present petition.

B. The Commission's Rules of Practice (10 CFR §2.714) require that a petition for leave to intervene "shall set forth with particularity the interest of the petitioner in the proceeding, and how that interest may be affected by the results of the proceeding."

The Petitioner has not satisfied this requirement whether he is petitioning for intervention on behalf of himself or the Down East Alliance.

With regard to interest and standing to intervene as-of-right, the Commission has established that contemporaneous judicial concepts of standing are to be applied in determining whether a petitioner should be admitted as a party to an NRC proceeding. *Portland General Electric Company, et al.* (Pebble Springs Nuclear Plant, Units 1 and 2), CLI-76-27, 4 NRC 610, 613-14 (1976); *Public Service Company of Oklahoma, et al.* (Black Fox Station, Units 1 and 2), ALAB-397, 5 NRC 1143, 1144-45 (1977). Consequently, a petitioner must show that the proposed action which is the subject of the proceeding could result in "injury in fact"⁵ to an interest which is "arguably within the zone of interest" protected by the Atomic Energy Act or the National Environmental Policy Act. Pebble Springs at 4 NRC 613-14. Further, the Petitioner has not demonstrated that he resides "within the geographical zone that might be affected by an accidental release of fission products," *Louisiana Power and Light Company* (Waterford Steam Electric Station, Unit 3), ALAB-125, 6 AEC 371, 372 at n.6 (1973)⁶ or that his normal everyday activities is in the vicinity of the Maine Yankee facility. *Gulf States Utilities Company* (River Bend Station, Units 1 and 2), ALAB-183, 7 AEC 222, 226 (1974).⁷ The Petitioner has made no attempt to assert an injury in fact. He does, however, state a mailing address. The address, given by the Petitioner, Gouldsboro, Maine, is more than 90 miles from the Maine Yankee facility. This is well beyond the distance found by the Appeal Board to be "within the geographical zone of interest."

⁵ "Abstract concerns" or a "mere academic interest" in the matter which are not accompanied by some real impact on a petitioner will not confer standing. *Transnuclear Inc., et al.* (Ten Applications for Low-Enriched Uranium Exports to Euratom Member Nations), CLI-77-24, 6 NRC 525, 531 (1977); *Portland General Electric Company* (Pebble Springs Nuclear Plant, Units 1 and 2), CLI-76-27, 4 NRC 610, 613 (1976). Rather the asserted harm must have some particular effect on a petitioner, *Transnuclear, supra*, and a petitioner must have some direct stake in the outcome of the proceeding. See *Allied-General Nuclear Services, et al.* (Barnwell Fuel Receiving and Storage Station, ALAB-328, 3 NRC 420, 422 (1976).

⁶ The Appeal Board has held that geographical proximity of a member's residence to a facility is sufficient, standing alone, to satisfy the interest requirements of 10 CFR §2.714. *Virginia Electric and Power Company* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-522, 9 NRC 54, 56 (1979).

⁷ A petitioner who resides at an appreciable distance from a nuclear facility but who frequently engages in substantial business and related activities in the vicinity of the facility may establish the requisite interest and standing. See *Portland General Electric Company, et al.* (Trojan Nuclear Plant), Order Concerning Requests for Hearing and Intervention Petitions (unpublished), July 27, 1978 and *Portland General Electric Company, et al.* (Trojan Nuclear Plant) ALAB-496, 8 NRC 308 (1978). See note 9, *supra*.

To the extent the Petitioner seeks to intervene on behalf of Down East Alliance,⁸ he has also failed to demonstrate the necessary "interest." It is well settled that an organization may gain standing to intervene based on injury to itself or to its members. TVA (Watts Bar Nuclear Plant, Units 1 and 2), ALAB-413, 5 NRC 1418 (1977). If the organization seeks standing on its own behalf, it must establish that it will be injured and that the injury is not a generalized grievance shared in substantially equal measure by all or a large class of citizens. *In the Matter of Ten Applications CLI-77-24*, 6 NRC 525, 531 (1977). On the other hand, an organization can establish standing through members of the organization who have interests which may be affected by the outcome of the proceeding. *Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-322, 3 NRC 328, 330 (1976). At the same time, when an organization claims that its standing is based on the interests of its members, the organization must identify specific individual members whose interest might be affected by the proposed action, describe how the interests of each of those members might be affected and show that each of those members has authorized the organization to act on his behalf. *Allied General Nuclear Services, et al.* (Barnwell Fuel Receiving and Storage Station), ALAB-328, 3 NRC 420, 422 (1976); *Public Service Electric & Gas Company* (Salem Nuclear Generating Station, Units 1 and 2), ALAB-136, 6 AEC 487, 488-89 (1973); *Duquesne Light Company, et al.* (Beaver Valley Power Station, Unit 1), ALAB-109, 6 AEC, 244 at n.2 (1973).

The Petitioner has made no attempt to demonstrate standing based on an injury to Down East Alliance itself, or to any of its members. Accordingly, the Petitioner has completely failed to establish interest and standing to intervene as-of-right with respect to himself or Down East Alliance.

C. Although a petitioner may lack standing to intervene as of right under judicial standing concepts, he nevertheless could be admitted as a party in the Licensing Board's discretion. The Licensing Board is to be guided in this exercise of discretion by a consideration of the factors set forth in 10 CFR §2.714(a) and (d):

- (1) the extent to which the petitioner's participation may reasonably be expected to assist in developing a sound record;
- (2) the nature and extent of the petitioner's property, financial or other interest in the proceeding;
- (3) the possible effect on the petitioner's interest of any order which may be entered in the proceeding;

⁸ The Petitioner has not given any indication that he has been authorized to represent Down East Alliance.

- (4) the availability of other means whereby the petitioner's interest will be protected;
- (5) the extent to which the petitioner's interest will be represented by existing parties; and
- (6) the extent to which the petitioner's participation will inappropriately broaden or delay the proceeding.

Portland General Electric Co. (Pebble Springs Nuclear Plant, Units 1 & 2), CLI-76-27, 4 NRC 610, 616 (1976). In this regard, the most important factor to consider is the extent to which the petitioner's "participation would likely produce 'a valuable contribution . . . to [the] decision making process'". *Public Service Co. of Oklahoma* (Black Fox Station, Units 1 and 2), ALAB-397, 5 NRC 1143, 1145 (1977). The burden of convincing the Licensing Board that discretionary intervention is appropriate rests upon the petitioner. *Nuclear Engineering Co.* (Sheffield Low Level Radioactive Waste Disposal Site), ALAB-473, 7 NRC 737, 745 (1978).

It is clear from an examination of the instant Petition that the Petitioner has failed to demonstrate any reason why discretionary intervention should be granted. Accordingly, the Petition must be denied.

D. As noted hereinabove, Petitioner has advanced a single contention which is vague and totally devoid of any basis.

As a general matter, for a contention proposed to be admissible, it must fall within the scope of the issues set forth in the *Federal Register* Notice of Hearing (Notice of Hearing) in this proceeding, and comply with the requirements of 10 CFR §2.714(b). 10 CFR §2.714(b) requires that a list of contentions which petitioners seek to have litigated be filed along with the bases for those contentions set forth with reasonable specificity.

It is incumbent upon the Petitioner to (1) set forth contentions which are sufficiently detailed and specific to demonstrate that the issues are admissible and that further inquiry is warranted, and to put the other parties on notice as to what they will have to defend against or oppose and (2) set forth the reasons (basis) for each of the contentions without having to detail the evidence which would later be offered in support of each contention. *Philadelphia Electric Co.* (Peach Bottom Atomic Power Station, Units 2 and 3) ALAB-216, 8 AEC 13, 20-21 (1974); *Houston Lighting and Power Company* (Allens Creek Nuclear Generating Station, Unit 1), ALAB-590, 11 NRC 542, 546-551 (1980).

The Petitioner, here, has failed to meet these requirements in every respect. The specific contention submitted on August 29, 1981 provides no basis and is so vague that the parties could not possibly be on notice as to what they would have to defend against. Accordingly, the Petitioner has failed to meet the contention requirements of 10 CFR §2.714.

II.

In the undated, untitled, document mailed on November 23, 1981, Petitioner requested that a prehearing conference be scheduled to enable Petitioner to more fully respond to the arguments in opposition to the specific contention advanced in his amended petition of August 29, 1981. However, on the basis of the written filings submitted to date, the Board does not believe that another prehearing conference is necessary or desirable. Petitioner has had ample opportunity to address in writing the objections to his specific contention. Moreover, Petitioner has completely failed to establish interest and standing to intervene in the instant proceeding.

III.

Today, after this Order had been drafted, the Board received another untitled pleading from the Petitioner. This document of five pages bearing the date "Tuesday 12/29/81" was docketed on January 15, 1982 and served on all parties on January 21, 1982.

The Board has considered the December 29, 1981 filing of the Petitioner and determined that nothing in this latest filing cures the deficiencies in the Petition for Leave to Intervene filed by David Colton-Manheim which have been identified above.

IV.

For the foregoing reasons, the Board finds (1) that the Petitioner has failed to demonstrate good cause or a favorable balancing of other factors which must be considered in support of his late filed petition, and (2) that even if the Board determined that it would entertain the Petition, it must be denied because it failed to satisfy the "interest" and "contention" requirements of 10 CFR §2.714.

V. ORDER

For the foregoing reasons and based upon a consideration of the entire record in this matter, it is this 22nd day of January, 1982

ORDERED

(1) That the Petition for Leave to Intervene filed by David Colton-Manheim is *denied*, and

(2) That David Colton-Manheim's request to make a limited appearance in this proceeding is *granted*.

This Order denying a petition for leave to intervene may be appealed by the Petitioner to the Atomic Safety and Licensing Appeal Board within ten (10) days after service of the Order. The appeal shall be asserted by the filing of a notice of appeal and accompanying supporting brief.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

Robert M. Lazo, Chairman
ADMINISTRATIVE JUDGE

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Marshall E. Miller, Chairman
Dr. Richard F. Cole
Dr. A. Dixon Callihan**

In the Matter of

**Docket Nos. STN-50-454-OLA
STN-50-455-OLA**

**COMMONWEALTH EDISON
COMPANY
(Byron Station, Units 1
and 2)**

January 27, 1982

The Licensing Board denies Intervenor's motion for reconsideration of the Board's order dismissing Intervenor as a party for failure to comply with orders requiring discovery.

RULES OF PRACTICE: DISCOVERY

Discovery in Licensing Board proceedings "shall relate only to those matters in controversy" which have been identified by the presiding officer. 10 CFR §2.740(b)(1). Interrogatories propounded to the NRC Staff by Intervenor, the Rockford League of Women Voters (League), were not pending and unanswered as of the date of the Board's dismissal of the League as an intervening party for failure to make discovery, where such interrogatories had been filed more than 9 months prior to the Board's order ruling on the admissibility of the League's revised contentions, and directing the commencement of formal discovery.

RULES OF PRACTICE: MOTION FOR RECONSIDERATION

The mere filing of a motion for reconsideration does not stay in any way the order to which it is directed, nor render it less than final. Consequently, the pendency of Applicant's motion for reconsideration of

the Board's ruling on the admissibility of contentions did not excuse the League's failure to respond to Applicant's interrogatories, particularly since a subsequent Board order directing the League to furnish the requested discovery promptly also denied Applicant's motion for reconsideration.

RULES OF PRACTICE: DISCOVERY; SANCTIONS

The extensive ramifications of Intervenor's involvement in discovery, hearings, motions, correspondence and disputes in a contemporaneous state proceeding could not be used to exculpate its persistent defiance of the Board's orders, particularly where its involvement in the state proceeding was never brought to the attention of the Board as a matter affecting the Board's management or scheduling of the instant proceeding.

RULES OF PRACTICE: DISCOVERY; SANCTIONS

Counsel's allegations of professional and personal problems as excuses for Intervenor's failure to provide discovery did not justify reconsideration of the Board's imposition of sanctions for such failure, where such allegations were expressly dealt with in the Board's order compelling discovery.

RULES OF PRACTICE: DISCOVERY; SANCTIONS

In light of Intervenor's deliberate and willful refusal to provide the evidentiary bases for its admitted contentions, despite the clear mandates of the Board's orders requiring discovery, the League could not challenge the imposition of the sanction of dismissal by arguing that other NRC cases involved lesser penalties.

**MEMORANDUM AND ORDER
(Denying Motion for Reconsideration)**

On October 27, 1981, the Board entered an Order striking all of the admitted contentions previously filed by the Rockford League of Women Voters (League) and dismissing the League as an intervening party. The Order also denied the League's motion for sanctions against the Commonwealth Edison Company (Applicant).

The League filed a petition for reconsideration of this Order on November 6, 1981, supported by 25 exhibits. The Applicant filed its opposition to the petition for reconsideration on November 23, 1981, supported by 24

exhibits. The Staff took no position on the reconsideration matter, but stated in its letter dated November 13, 1981 that this statement of position should not be construed as an endorsement of any claims made in the petition. The Staff also objected to the League's apparent suggestion that the Staff was or is obligated to respond to "discovery" served by the League on March 12, 1980.

Inasmuch as the Applicant's opposition included four affidavits which described certain oral statements allegedly made by the League's counsel at a meeting held September 26, 1979, the parties who attended that meeting were requested to file affidavits giving their best recollection of such discussions (Order entered December 8, 1981). Affidavits (and objections) were filed on December 21, 1981 by Myron M. Cherry, Esq., Betty Johnson and Connie V. Ware on behalf of the League. Affidavits were filed by Richard Goddard and Calvin Moon of the Staff on December 23, 1981, although they are no longer involved on behalf of the Staff in this proceeding. One additional affidavit of Michael I. Miller was filed by the Applicant on December 21, 1981.

The Board has considered all of the documents filed by the parties and it has concluded that the petition for reconsideration should be denied.

The League's petition for reconsideration seriously distorts the facts leading up to the October 27, 1981 Order of dismissal. First, it now asserts for the first time that certain interrogatories filed by it on March 12, 1980, were pending and unanswered throughout this proceeding, and somehow justify the League's flouting of the Board's discovery orders.¹ The Staff describes this issue as a matter "raised for the first time in the present context" by which "the League appears to suggest that the Staff was/is obligated to respond to 'discovery' served by the League on March 12, 1980. This is not the case."² We agree.

The "discovery" request of March 12, 1980, preceded the Board's Memorandum and Order entered on December 19, 1980, which for the first time designated which contentions were to be admitted as matters in controversy in this proceeding, and opened discovery thereon.

Originally, 13 proposed contentions were filed by the League. The Board, acting as an Intervention Board at a special prehearing conference held August 21-22, 1979, found standing and at least one viable contention. All parties were then requested to confer and negotiate regarding proposed contentions, with no limit placed on the number or scope of proffered contentions.³ The parties were directed to provide the Board a

¹ League's petition for reconsideration, pp. 3-8.

² Staff's letter to the Board regarding the League's petition for reconsideration, as to which it generally took no position, dated November 13, 1981.

³ LBP-80-30, 12 NRC 683, 690 (1980); LBP-81-30A, 14 NRC 364, 365 (1981).

report on the final statement of contentions and issues by October 15, 1979.⁴ No report was filed, and consequently the Board on February 21, 1980 granted the Applicant's motion for a ruling on the original 13 contentions and directed the filing of briefs. On February 22, 1980, Mr. Myron M. Cherry entered his appearance as counsel for the League and requested an extension of time to file contentions. Thereafter on March 10, 1980, the League filed 146 numbered contentions set forth in 113 pages of allegations.

The "discovery" request of March 12, 1980, filed two days after the filing of 146 revised contentions, consisted of interrogatories to the Applicant and the Staff, and a motion for a finding that answers from the Staff were necessary. This motion indicated that the requested information was to be used "in arriving at and framing the exact issues to be litigated." Both the Applicant and the Staff objected to these interrogatories on the grounds that the admissibility of the revised contentions had not yet been ruled upon by the Board, and hence discovery at that stage was impermissible.⁵

As noted by the Staff and Applicant, 10 CFR §2.740(b)(1) provides that discovery "shall relate only to those matters in controversy" which have been identified by the presiding officer. In March, 1980, no contentions had been ruled upon or held to be admissible; they were not filed until March 10, 1980. Accordingly, the Board reviewed and analyzed the 146 revised contentions proffered by the League, and on December 19, 1981 a detailed Order was entered ruling on the admissibility of the revised contentions.⁶

Although most of these numerous contentions were vigorously opposed by the Applicant and Staff, 114 contentions were admitted as matters in controversy. It was explicitly stated in the Order that "discovery shall commence forthwith upon all issues included in the admitted contentions."⁷ The Board intended that provision to dispose of all pending disputes concerning discovery, both as to the scope of controverted issues and the formal commencement of discovery. Nothing remained pending or undisposed of, and it was so understood by the parties. No question or suggestion to the contrary was ever made by the League or anyone else from December 19, 1980, until the petition for reconsideration was filed November 6, 1981.

⁴ Transcript of special prehearing conference, August 21-22, 1979 (Tr.), at 114.

⁵ Objections of Applicant filed March 29, 1980, and Answer of the Staff filed March 26, 1980.

⁶ LBP-80-30, 12 NRC 683 (1980).

⁷ *Ibid.*, at 698.

The League has not initiated any discovery in this proceeding since the December, 1980 Order ruling on all contentions, nor has it responded to the discovery requests of others. Even in its response to the Applicant's motion for sanctions, filed by the League October 13, 1981, there was no mention of its interrogatories filed March 12, 1980 nor any claim that they were somehow still pending and unanswered. The *post mortem* attempts of the League and its counsel to resurrect these interrogatories must be viewed as a disingenuous effort to alter the known facts after sanctions were imposed. It will not be permitted.

On July 8, 1981, the Applicant served interrogatories on the League which sought the factual bases of all admitted contentions and their evidentiary support. Answers were not filed by the League on their due date, and on July 30, 1981 the Applicant filed a motion to compel discovery. The League's objections to these interrogatories and its response to the motion to compel were overruled by our Memorandum and Order entered August 18, 1981.⁸ The reasons for our action were described in that Order, as well as our Order granting sanctions entered October 27, 1981 (14 NRC 901, 902-905), and will not be repeated here. We note only that the League attempts to excuse its failure to answer the July 8, 1981 interrogatories because there was pending a motion by the Applicant for reconsideration of the December, 1980 Order ruling on admissibility of contentions. That position is fallacious. The mere filing of a motion for reconsideration does not stay in any way the order to which it is directed, nor render it less than final. The League and its counsel had no reason to believe otherwise. Once again they never raised the question nor filed any time extension requests with the Board. In fact, this excuse totally vanished when our August 18, 1981 Order was entered, which among other things denied reconsideration and clearly directed the League to furnish the ordered discovery *promptly*.

The League next attempts to contrive a "discovery overlap" by seeking to intertwine an Illinois Commerce Commission matter with this NRC operating license proceeding. This Board has never recognized that ICC matter as parallel to or in any way involved in this proceeding. The extensive ramifications of the League's involvement in discovery, hearings, motions, correspondence and disputes in the ICC matter cannot be used to exculpate their persistent defiance of this Board's orders. We have consistently refused to be drawn into that procedural jungle, whether as a matter of tactics or otherwise. The unilateral declaration that ". . . the League determined that insofar as practicable it would be desirable to deal with overall discovery as a unit . . .", cannot be used to justify a pattern of

⁸LBP-81-30-A, 14 NRC 364, 369-70, 373-74 (1981).

conduct which flouts the Board's orders. Nor can disputes between counsel, whether contrived or not, justify such conduct. It is noteworthy that these alleged dealings with the ICC Hearing Examiner in a state administrative proceeding, were never brought to the attention of the Board as affecting its management or scheduling of the instant proceeding. Such a collateral inquiry would not have been permitted to entangle or delay the expeditious handling of this operating license adjudication.

Such specious arguments as the so-called *ex parte* telephone conference of October 2, 1981 have been dealt with in our dismissal Order (14 NRC 906-907) and need not be further dealt with here. The persistent and continuing attempts of the League's counsel to use alleged professional and personal problems as excuses for delays or dilatory conduct were expressly dealt with in the August 18, 1981 Order.⁹ In spite of this clear admonition, the League's counsel continues to try to overrule the Board's directions.¹⁰ The unopposed extension of time to file a brief with the United States Court of Appeals for the Seventh Circuit (Petition for Reconsideration, p. 24), is not analogous. Obviously the appellant is the only party who might be prejudiced by delay. A requested and granted delay of 30 days to file a brief does not constitute a determination of the merits of counsel's excuses.

The League attempts to challenge the imposition of the sanction of dismissal by arguing that other NRC cases involved lesser penalties. Upon the facts in this record, the League cannot successfully contend that it made its decisions to ignore or challenge the Board's Orders in reliance upon its belief that other boards tolerated such behavior longer. A party cannot repeatedly test a board to see how close it can come to defying orders with impunity, without running some risk of encountering sanctions.

Finally, we note that even at this late date the League has successfully refused to provide the evidentiary bases for its admitted contentions, in spite of the clear mandates of Orders entered December 19, 1980¹¹ and August 18, 1981.¹² The petition for reconsideration of the order of dis-

⁹ 14 NRC 364, 373, stating that the "involvement of a party's lawyers in litigation or other professional business does not excuse noncompliance with nor extend deadlines for compliance with our rules of practice."

¹⁰ Response of Rockford League of Women Voters to Motion for Sanctions, filed October 13, 1981, p. 2; League's Petition for Reconsideration, filed November 6, 1981, pp. 8, 20 fn. 18, 23-24.

¹¹ 12 NRC 683, 698.

¹² 14 NRC 364, holding that the Applicant "is entitled to obtain discovery concerning the bases of these contentions, since a good deal of information is already available to the League from the FSAR and other documents. The League must furnish such information promptly, and it cannot delay until the SER or other documents are filed . . . there is presently available a large amount of documentary and other information. The movant is entitled to full and responsive answers based upon the presently known status of these matters, and to additional information when it becomes available." (at 369, 373).

missal does not proffer the evidentiary or factual bases of any of the 114 admitted contentions. No Board can manage discovery and conduct reasonably expeditious operating license hearings if such deliberate and willful behavior is to be tolerated.

In passing upon the League's petition, we have not considered the affidavits filed by the parties concerning alleged statements made at a meeting on September 26, 1979. There are some conflicts of testimony in those affidavits. The credibility of the witnesses could only be determined by an evidentiary hearing involving cross-examination and observations of the appearance and demeanor of the witnesses. Such a collateral inquiry is unnecessary because our order of dismissal was not based upon such alleged statements, and they need not be considered here.

Upon consideration of the League's petition for reconsideration, the Board adheres to its Order entered October 27, 1981, dismissing the League as a party, and denying its motion for sanctions against the Applicant.

It is so ORDERED.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Marshall E. Miller, Chairman
ADMINISTRATIVE JUDGE**

Dated at Bethesda, Maryland
this 27th day of January, 1982.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Peter B. Bloch, Chairman
Jerry R. Kline
Hugh C. Paxton**

In the Matter of

**Docket Nos. 50-266-OLA
50-301-OLA**

**WISCONSIN ELECTRIC POWER
COMPANY**

**(Point Beach Nuclear Plant,
Units 1 and 2)**

January 28, 1982

The Board upheld, after reconsideration, its previous decision concerning the release to the public of a portion of an allegedly proprietary affidavit that had been submitted in support of the confidentiality of other documents.

The Board rules that it is appropriate for it to address issues concerning the confidentiality of a portion of its record, regardless of whether the issue was raised by a party. Such an action is in response to a "proposal" that a document be treated as proprietary and is not a prohibited *sua sponte* action of the Board.

For an affidavit to be exempt from the Board's general authority to rule on proposals concerning the withholding of information from the public, that affidavit must meet the regulatory requirement that it have "appropriate markings". When the plain language of the regulation requires "appropriate markings", an alleged tradition by which Staff has accepted the proprietary nature of affidavits when only a portion of the affidavits is proprietary is not relevant to the correct interpretation of the regulation.

In addition, the Board rules that legal argument may not appropriately be withheld from the public merely because it is inserted in an affidavit, a portion of which may contain some proprietary information.

The Board clarifies its earlier ruling so that it would not be interpreted to suggest that Westinghouse Corporation had been morally culpable in

claiming confidentiality for an entire affidavit, only a portion of which contained proprietary information. It also apologizes for unnecessarily castigating Westinghouse about lack of concern for the public's right to know.

RULES OF PRACTICE: CONFIDENTIAL DOCUMENTS

Affidavits supporting the proprietary nature of other documents can be withheld from the public only if they have "appropriate markings". An entire affidavit may not be withheld because a portion is proprietary. The Board may review an initial Staff determination concerning the proprietary nature of a document to determine whether the review has addressed the regulatory criteria for withholding.

A party may not withhold legal arguments from the public by inserting those arguments into an affidavit that contains some proprietary information.

RULES OF PRACTICE: *SUA SPONTE* ISSUE

A Board decision to review a proposal concerning the withholding of a portion of the record from the public is an appropriate exercise of Board authority and is not subject to the *sua sponte* limitation on Board authority.

RULES OF PRACTICE: INTEGRITY OF OTHER PARTIES

Parties should not impugn one another's integrity without first submitting supporting evidence.

RULES OF PRACTICE: INTERPRETATION OF REGULATIONS

Regulations should be interpreted by examining the meaning of the words contained in the regulations. Unless there is some ambiguity in the words, practices in implementing the regulations are not relevant to their correct interpretation.

MEMORANDUM AND ORDER (Concerning Reconsideration of Confidentiality Issues)

On December 31, 1981, Westinghouse Electric Corporation (Westinghouse) filed a motion to reconsider aspects of our decision of

December 21, 1981. (Hereinafter this motion will be cited as "Westinghouse".) Westinghouse challenges our decision that it did not appropriately certify as confidential a portion of the Wiesemann affidavit that we determined should be released to the public. It also challenges as improper certain language used by the Board in the memorandum accompanying the disputed order.

The staff of the Commission (staff) supports Westinghouse's claim that the disputed portion of the Wiesemann affidavit should not be released. refrains from commenting on the use of pejorative language.

I. BACKGROUND

Westinghouse's first ground for reconsideration is that it was not adequately apprised of the issues to be decided and that it therefore lacked an adequate opportunity to present its case. Westinghouse at 2. The staff joins Westinghouse in this argument.

In order to clarify the issue of whether Westinghouse and the staff had an opportunity to present their case concerning the appropriate treatment of the Wiesemann affidavit, we have constructed Table 1, which sets forth some of the relevant events.

TABLE 1

Summary of Events Relating to Wiesemann Affidavit

Date	Event
October 9, 1981	The Board requests an affidavit giving more support for the confidentiality of Westinghouse documents, particularly with respect to the unique nature of the Westinghouse processes and the competitive harm to Westinghouse from release of the information. Tr. 95.
November 13, 1981	The requested affidavit, by Mr. Wiesemann, is received, marked to indicate that all of it was confidential and accompanied by a certification that "this affidavit contains Westinghouse proprietary information".
November 16, 1981	Judge Bloch telephones Westinghouse, requesting further particularization of why the affidavit is confidential in its entirety.

- November 17, 1981 On-the-record telephone conference. Westinghouse acknowledges that the Board has expressed doubts that the Wiesemann affidavit can be properly withheld and insists that §2.790(b)(1)(ii) "clearly gives the discretion to state baldly that the information is proprietary in its entirety." Tr. 784. Staff questions Board jurisdiction over confidentiality issues. Tr. 792, 793. Judge Bloch questions the claim that the entire affidavit is confidential. Tr. 794. Staff states its practice of accepting claims of trade secret status of affidavits without a "full reduction process". Tr. 794. Applicant argues that the Board should not consider confidentiality *sua sponte*. Tr. 797-798. The Board comments. Tr. 798-799. The Board asks Westinghouse to release all but one sentence of the affidavit. Tr. 807. The Board authorizes the filing of briefs on the Board's jurisdiction. Tr. 823-825.
- After Nov. 17. The Board receives a non-proprietary version of the Wiesemann affidavit, permitting most of the affidavit to be released to the public.
- December 7, 1981 Staff and Westinghouse both file briefs on the Board's jurisdiction.
- December 11, 1981 Applicant's reply brief on the Board's jurisdiction.
- December 17, 1981 Westinghouse's reply brief on the Board's jurisdiction.
- December 21, 1981 The Board's Memorandum and Order (concerning Preliminary Confidentiality Issues)

We note that the Board left nothing to the imagination about its concern that information not be withheld from the public unnecessarily. On November 16, 1981, the Board requested further information about the alleged confidentiality of portions of the Wiesemann affidavit. On-the-record, on November 17, 1981, the Board heard limited arguments about this issue, expressed continuing concern about keeping the entire Wiesemann affidavit from the public, and authorized the filing of briefs and reply briefs on the subject. Westinghouse then voluntarily released a large portion of the affidavit. Briefs were subsequently filed. Only then did the Board decide that a portion of the Wiesemann affidavit be released to the public.

Now, in motions for reconsideration of our December 21 decision, Westinghouse and staff stress that Westinghouse's treatment of its affidavit followed a practice that industry has engaged in, with staff approval. This argument was first raised during the November 17 telephone conference. Tr. 794.

Given the many opportunities to contest the Board's jurisdiction over the Wiesemann affidavit, we do not agree with Westinghouse's argument that it was not accorded due process. The Board's decision interpreted a portion of the regulations that all parties agreed to be relevant. Surely, the interpretation of that section was the central issue to be decided and the fact that the parties chose not to argue the interpretation adopted by the Board did not alter our obligation to reach a correct determination.

II. *SUA SPONTE* ISSUE

Westinghouse asserts that the Board should not have decided whether or not to release the Wiesemann affidavit to the public because the issue was not raised by a party. It cites the limitations on the Board's *sua sponte* authority (the authority for the Board to bring up issues by itself) contained in 10 CFR § 2.760a. Applicant earlier relied on this argument as well. Staff supports Westinghouse on this issue.

However, this issue was raised by Wisconsin Electric Power Company when it proposed to withhold a Westinghouse document from the public. We do not consider the *sua sponte* rule as restricting our obligation to rule on the Westinghouse proposal. Memorandum and Order of December 21, 1981, 14 NRC 1747, 1760-62, 1753-56 (emphasizing that people submitting documents may *propose* the withholding of trade secrets but that the Commission must determine whether to accept the proposal).

No party to this case has presented an argument contradicting our interpretation of this regulatory language, which we consider to be binding on us. It is specific language dealing with decisions concerning proprietary information and it controls the more general language, found in the *sua sponte* restriction on our substantive concerns. (See also Tr. 802, where intervenor expressed an interest in the release of the Wiesemann affidavit.)

III. APPROPRIATE MARKINGS ISSUE

Westinghouse argues that it may protect the confidentiality of an entire affidavit supporting the confidentiality of other documents without segregating portions of the affidavit that are confidential from other portions that are not. Staff supports the Westinghouse position.

Westinghouse relies on "the dialogue leading to the adoption of §2.790" and on subsequent practice under that section. However, it does not cite any official records concerning the "dialogue" so we do not consider that argument relevant. On the other hand, staff joins Westinghouse in its

assertion that it is "the policy and practice of the Staff to require and accept affidavits with a claim of proprietary in their entirety without requiring the application of a procedural requirement to parse the affidavit for specific proprietary portions."

In its argument, Westinghouse does not address the question of the proper interpretation of "appropriate markings" in §2.790(b)(1)(ii), except to the extent that it implies that the language ought to be interpreted in light of established practice. We consider this to be a deficiency in Westinghouse's argument. Practice is relevant to the interpretation of statutes or regulations only when the regulations are themselves ambiguous. If the language is unambiguous, practice may indicate that the regulations have been disregarded without casting light on the meaning of the words.

Staff has attempted to parse the language of §2.790(b)(1)(ii). In particular, staff argues that the regulations state that "the affiant *may* designate with appropriate markings . . ." information in the affidavit claimed to be proprietary. Staff emphasizes that "may" is permissive, not mandatory.

However, staff has not completely analyzed the cited passage. The permissive aspect of the cited passage is that affiants may (or may not) choose to mark any portion of their affidavits as trade secrets. However, other words following the "may" are important for correct interpretation.

The regulation could have said merely, "the affiant may designate information submitted in the affidavit" . . . as trade secrets. It did not. Rather, the complete phrase is "may designate *with appropriate markings* information submitted in the affidavit" . . . as trade secrets. That additional portion of the phrase is a restrictive modifier of "may designate". Hence, if the affiant chooses to designate information, it must be done with markings that are *appropriate*.

We point out that this straightforward linguistic interpretation is consistent with the policy of the Commission set forth in §2.790(b)(2), to balance legitimate protective concerns against the right of the public to be fully informed. That is, the Commission chose to rely on affiants to claim, in good faith (and with *appropriate* markings), that portions of their affidavit contain trade secrets. Given the comparatively unimportant nature of these affidavits, such reliance seems reasonable.

However, we are convinced that the decision to rely on affiants to use appropriate markings was not intended to be a *carte blanche* to keep secret an entire document because somewhere within it there is a single fact that is a trade secret. That would be inconsistent with the overall policy enunciated by the Commission. Yet, that is what both Westinghouse and staff are here arguing.

Furthermore, we have pointed out that legal argumentation never was intended to be included in a confidential affidavit, which should be limited to facts. *Id.* at 1762-63. This ground for decision has not even been addressed by the parties. Yet the one "fact" whose release is disputed is more legal argumentation than fact.

However appropriate staff's actions may have been in the past in relying on good faith assertions of the confidential status of affidavits, we are convinced that it was in error in not more carefully scrutinizing this affidavit. The Commission's regulations are not intended to permit the withholding of an entire affidavit because one portion should be kept confidential. Within broad limits, good faith certifications may be accepted. But there are limits, even to this generally salutary practice. *See* 14 NRC 1762-63 (1981).

For these reasons, it would not be appropriate to reverse our ruling on the release of a portion of the Wiesemann affidavit.

IV. "GOOD FAITH"

Apart from the conclusion we reached concerning the Wiesemann affidavit, Westinghouse and staff have objected to certain language we used that they believe reflects unduly on their motives.

Although motions to reconsider ordinarily should address substantive decisions that have been made, we believe it appropriate to address these objections. A person's reputation is a valuable possession and government ought not to unduly interfere with it. This principle applies to corporations and parts of agencies as well as to individuals.

The portion of our decision that drew objections read:

[O]ur review of the entire document that was claimed to be confidential *in its totality* persuades us that the certification that the entire document was confidential was not affixed with sufficient care to amount to good faith.

[Emphasis in original.] *Id.* at 1762. This section was carefully drafted. It immediately follows our discussion of the meaning of "appropriately marked" and applies an *objective* test of good faith" that does not rest on any moral assessment. The concept expressed is consistent with our belief that there are limits on the discretion granted to affiants. When an affiant claims that a document is confidential and then marks the whole document as confidential, that act affects the public's right to know. We interpret the applicable regulations to require that the affiant must in good faith believe that each section claimed in an affidavit to be confidential is in fact to be given confidential treatment.

To the extent that Westinghouse was relying on established precedent in claiming protection for its entire affidavit, it was not morally culpable. Hence, we wish to clarify this passage by assuring Westinghouse that we

did not accuse it of falsely signing an affidavit or of otherwise committing an act that was not in good faith. Their fault, if any, was in the incorrect interpretation of the regulations.

V. THE PUBLIC'S RIGHT TO KNOW

Westinghouse objects to our finding that it did not show sufficient concern for the public's right to know. On consideration of this objection, we retract our original statement as being unnecessary to our opinion. The objectionable language was an overexuberant way of saying that Westinghouse apparently does not fully appreciate the meaning of the policy expressed by the Commission in 10 CFR §2.790(b)(2). Our interpretation of that section, which continues to be relevant to this case, can best be understood by examining the way we balanced Westinghouse and public interests in our December 21 Memorandum. *Id.* at 1764-66.

VI. TRUSTWORTHINESS

In our December 21 Memorandum and Order, we chastised Westinghouse for impugning intervenor's reputation without submitting proof. In its motion for reconsideration, Westinghouse presents its reasons for not having submitted proof. We understand those reasons. However, in light of those reasons, we also believe that Westinghouse should have refrained from casting aspersions on another person unless it was prepared to submit its proof.

Westinghouse also differs with the Board's interpretation of a telephone call from Judge Bloch to Westinghouse on November 30, 1981. The Board stated that it requested Westinghouse to supply information that Westinghouse had said in its brief that it was "prepared to show". The answer we received was that there was no evidence available and that the date it would be available was not yet known. Under the circumstances, we believe it to have been correct to state at that time, that charges of untrustworthiness were utterly without basis. We meant that the record was devoid of proof, and we were correct. That the proof was available somewhere or that it has since been assembled does not controvert our conclusion at that time.

Now, simultaneous with Westinghouse's Motion for Reconsideration, it has submitted a Request for Admissions, which begins to specify the fault it finds with intervenor. At this time we are first apprised of the specifics of Westinghouse's concern. Before now, the charge was unparticularized and unsubstantiated: that intervenor was not sufficiently trustworthy to receive documents. We knew only generally that it had something to do with previous conduct in a public agency proceeding. See 14 NRC 1760-61

(1981). Consequently, intervenor could only guess at the charges and could not defend itself. Tr. 801 (intervenor tries to guess).

It is our responsibility to see that parties not be subject to unsubstantiated charges in our proceedings.

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is this 28th day of January, 1982,

ORDERED

(1) Westinghouse Electric Corporation's December 31, 1981 motion for reconsideration of our December 21, 1981, MEMORANDUM AND ORDER (Concerning Preliminary Confidentiality Issues) is denied, except to the extent that certain language used in that opinion has been modified or interpreted in the accompanying memorandum.

(2) This is an interlocutory order and is not subject to appeal.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Nunzio J. Palladino, Chairman
Victor Gillinsky
Peter A. Bradford
John F. Ahearne
Thomas M. Roberts

In the Matter of

Docket Nos. 50-275 O.L.
50-323 O.L.

**PACIFIC GAS AND ELECTRIC
COMPANY**

**(Diablo Canyon Nuclear
Power Plant, Units 1 & 2)**

February 10, 1982

The Commission directs the staff to issue a Notice of Violation with regard to certain material false statements made by applicant at a November 3, 1981 meeting with staff concerning applicant's review of a report by its consultant addressing an ongoing seismic reverification program for the plant.

STATEMENT OF THE COMMISSION

The Commission has directed the NRC staff to issue a Notice of Violation with regard to statements made by representatives of Pacific Gas and Electric Co. (PG&E) at a public meeting with the NRC staff on November 3, 1981. These statements concerned PG&E's review of a report prepared by its consultant, R. L. Cloud Associates, Inc., addressing the ongoing seismic reverification program for Diablo Canyon Nuclear Power Plant. On the basis of the Report of the Special Investigation by the NRC staff (NUREG-0862, Issue 2), the Commission has concluded that statements made at that meeting and PG&E's subsequent failure to correct those statements constitute material false statements in violation of Section 186a of the Atomic Energy Act, as amended.

Due to concern about these violations and about the communication of information among PG&E officials and personnel and between PG&E and the NRC, the Commission has directed its senior staff to meet with

officials of PG&E to discuss an apparent lack of attention on the part of PG&E to its responsibilities in this area. The Commission intends PG&E to take steps as a result of this meeting to remedy this situation.

The Commission is taking no action at this time regarding PG&E's nomination of R. L. Cloud Associates, Inc. as primary auditor in its reverification program.

Separate views of Chairman Palladino and dissenting views of Commissioners Ahearne and Roberts are attached.

FOR THE COMMISSION

SAMUEL J. CHILK
Secretary of the Commission

Dated at Washington, D.C.
this 10th day of February, 1982.

ADDITIONAL VIEWS OF CHAIRMAN PALLADINO:

I believe that the information obtained from Pacific Gas and Electric Company (PG&E) during the November 3 meeting constitutes a material false statement. The fact that Mr. Norton's statement was false is confirmed by him during the investigation. The failure of PG&E to correct the statement despite opportunity to do so is also clear from the investigation. The fact that reviewer independence was a matter of concern in the reverification program that was being discussed on November 3, I believe, makes this statement a material false statement. The statement by Mr. Norton had the capability to influence the NRC staff with regard to the matter of independence. See *In the Matter of Virginia Electric Power*, 4 NRC 480, 487 (1976).

I have arrived at the conclusion that there has been a material false statement contrary to the Atomic Energy Act based on my review of the facts as set forth in the Report of the Special Investigation. I have voted to issue the notice of violation solely because I believe it is correct.

Commissioners Bradford and Gilinsky agree with these views.

DISSENTING VIEWS OF COMMISSIONER AHEARNE

I disagree with the Commission's action because it establishes an unacceptably low threshold for a material false statement. I believe we should establish that licensees and applicants have two obligations when commu-

nicating with the NRC: representatives should be sure the basic information they provide is accurate, and they should never lie.

We need information to make sound regulatory decisions. Consequently we must receive accurate information, regardless of whether the licensee's representatives are aware of inaccuracies or not. Holding licensees liable for incorrect information, regardless of knowledge, should encourage responsibility for assuring accurate information. However, it is not realistic to expect people to be perfect nor is it critical to our regulatory activities. We should focus on important information. Nevertheless, *deliberately* misleading the NRC undermines the entire regulatory framework. Thus I would hold a licensee responsible for *any* statement, regardless of significance, which is deliberately false.

Therefore, if there is an incorrect or misleading statement or omission, I would ask two questions in considering whether the NRC should take action: (1) Was the statement made with knowledge that it was false? (2) What significance does it have? If a statement was deliberately false, action must be taken. The statement's significance will affect the penalty.

If the statement was not deliberately false, but was significant, action also must be taken. If the statement was neither deliberately false nor significant, action should not be taken.

In this case, based on I&E's investigation report and interviews, and the transcript of the November 3 meeting, I am unable to conclude that any incorrect statements were deliberate. With respect to significance, I do not believe the nature of the information was such that one would reasonably conclude the information was of significance. Most of the arguments on significance have gone to the fact that the statements were false, not to any inherent importance of the information. The Commission bases its determination of materiality on the supposed relation to the question of independence of the reverification program. However, the NRC had given no guidance on the meaning of independence, the behavior met standard practice concerning drafts by independent consultants, and my interpretation of the context of the November 3 meeting is that this was a peripheral issue. Therefore, I do not agree that the information was sufficiently significant to provide a basis for a violation.

I agree the conduct in this case was not the best. I believe that Mr. Norton, as chief representative of PG&E, was inadequately prepared for the meeting. Mr. Rocca and Mr. Houk apparently believed misleading statements had been made. I believe they should have pursued the issue more aggressively. There have been suggestions that this is symptomatic of

a general failure of PG&E to encourage its employees to fully participate and to provide appropriate information. Dr. Cloud should have clarified the matter at the meeting. However, none of this conduct rises to a level which justifies finding a violation.

My conclusions are reinforced by the findings of Phase Two of the investigation. If the investigation had revealed changes had been made to put PG&E in a significantly better light, I would have reexamined the available information for possible indications that people deliberately misled us (since those findings would have revealed an incentive to do so). However, the almost total lack of significance in the changes supports the conclusion that the statements were not deliberately incorrect.

Not finding a violation will cause a major problem with public perception. The general impression seems to be that there is a serious issue here. People are watching to see what action the NRC will take. Not taking action will reinforce the view that we are not sufficiently tough on the industry. I am sympathetic to this concern. Public perception affects our ability to accomplish our mission. However, I am not willing to take an enforcement action unless I am convinced that it is the correct thing to do. In this case the statements do not rise above my threshold: I conclude they were neither deliberate nor significant. Thus, although I support discussing the general problem mentioned above with the appropriate PG&E officials, I cannot support issuing a notice of violation.

SEPARATE DISSENTING VIEW OF COMMISSIONER ROBERTS

I take strong exception to this action by the Commission.

It would appear that there was a false statement. It is not at all apparent to me, however, that this statement was a material false statement within the sense of the Atomic Energy Act. Section 186 of that Act indicates that a material false statement must be either a statement in an application or a statement of fact required under section 182 (which concerns the contents of an application). The statement at issue does not fall within these requirements. Additionally, to justify this action on the basis of the decision in *Virginia Electric and Power Co.* (North Anna Power Station, Units 1 and 2), CLI-76-22, 4 NRC 480, 487 (1976) is spurious. That case also involved statements and lack of statements in an application. There is a quantum leap from statements made in a meeting (even considering a transcript was made and offered to the participants for review) to statements or lack of statements made in a license application. Under the Atomic Energy Act, a statement cannot be a "material false statement"

merely because it is false, capable of influencing judgment, and relates to a matter of concern. Thus, by the yardsticks of logic, common sense, and the Atomic Energy Act, this circumstance cannot rise to the level of a material false statement.

**ADDITIONAL VIEWS OF COMMISSIONER GILINSKY REGARDING
PACIFIC GAS AND ELECTRIC'S MATERIAL FALSE STATEMENT**

(February 26, 1982)

On February 10, 1982, the Nuclear Regulatory Commission charged Pacific Gas and Electric with making a material false statement in discussions of the Diablo Canyon seismic design with the NRC. The Commission's Order was brief to the point of being telegraphic, and I sense that the public was left wondering about the Commission's finding as well as its significance in view of the Commission's failure to impose a civil penalty. What follows is my own view of the matter:

Last September, PG&E informed the NRC that errors had been discovered in the seismic design of the Diablo Canyon nuclear power plant, which had just received NRC permission for test and low power operation. The NRC suspended the low power license and required a reverification of the plant's seismic design. On November 3, the NRC met with PG&E officials, led by the Company President, Barton W. Shackelford, and with PG&E's consultant, Robert L. Cloud, to discuss the seismic reverification program being conducted by Dr. Cloud's firm.

As a result of questions raised by other parties to the case and in Congress, NRC was becoming increasingly interested in the extent to which Dr. Cloud's review would be conducted independently of PG&E. The Company naturally had a strong interest in emphasizing Dr. Cloud's independence since NRC's early acceptance of him as an independent reviewer might have speeded up the reverification program which stood in the way of the power plant's startup.

At the meeting, Harold Denton, NRC's Director of Nuclear Reactor Regulation, asked whether NRC would receive the same reports which Dr. Cloud gave to PG&E. George Maneatis, a PG&E Senior Vice President, responded "You just got it. And I have to say, Mr. Denton, that some of these things have just been disclosed to me, so you got it almost the same time I did."

Bruce Norton, PG&E's attorney in the Diablo Canyon case, stated "I might add we do not have it [Cloud's report]. It's not a question of us

reviewing it. We don't have it either. It just hasn't been done yet" He then added, with considerable force, "I frankly resent the implication that Dr. Cloud is not an independent reviewer because he is . . . The report itself hasn't been prepared. If you want a copy of it before we get it, fine, or simultaneously. It is an independent consultant, and you know, I don't know how we can show you that more than to give you the reports when they are prepared."

In fact, as NRC pieced together later, at the time these statements were made PG&E had already reviewed and commented on two separate drafts of Dr. Cloud's report and, unbeknownst to NRC, was about to receive the third draft. The NRC's subsequent investigation revealed that six of the PG&E officials at the November 3 meeting, including Donald A. Brand, the Vice President of Engineering, who was responsible for handling the Cloud contract, knew of PG&E's review of the Cloud reports. The Company's officials failed to correct the false statements made in the meeting. Perhaps more importantly, neither the Company nor Dr. Cloud corrected these statements after the meeting although they had ample opportunity to do so.

Mr. Norton, who had insisted at the November 3 meeting that PG&E had no access to Cloud's reports, told NRC investigators that he did not learn about drafts of the Cloud report submitted to PG&E until December 14. He had asked PG&E before the November 3 meeting about the status of Cloud's report and was apparently misinformed by his clients. He told the NRC investigators that, "If I had known the report of October 21st had been received by PG&E, I would not have said what I said because when I used the term report, I was encompassing any report whether it be preliminary, interim, final, whatever . . ."

Mr. Maneatis told the NRC investigators that, at the meeting, he was referring to Dr. Cloud's oral report of November 3 to the NRC. Mr. Maneatis explained that he did not know that PG&E had received written drafts of the Cloud report until he was told of such reports by the NRC on December 10. The other PG&E employees and Dr. Cloud have said that they assumed that the questions raised related to the *final* report, not to the *draft* reports.

This last artificial distinction won't wash. Even PG&E's General Counsel, Malcolm Furbush, agreed that the Company's statements "appear to be incorrect" and said that, "Had I known about those reports, I would have said something at the meeting." In fact, in this context, the draft reports

are inherently more significant; it is the drafting which determines what will be emphasized and what will not.

Where does this leave us? It is troubling that a company which seeks permission to operate nuclear power plants should be so insensitive to its obligation to inform federal regulators and the public. The issue is not the circulation of the reports but the false portrayal of PG&E's relationship with Dr. Cloud's firm. When we grant a utility the authority to operate a nuclear power plant we must be confident that its officials will be forthright with us. That is why the Commission's finding that PG&E had made a material false statement is so important.

I would have gone beyond the terms of the Commission's Order and imposed a civil penalty to underline the seriousness with which the Commission views PG&E's actions. Nevertheless, the Commission did require the top management of PG&E to meet with NRC officials to discuss ways of ensuring that this problem will not recur. A meeting between the Chairman of the Board of PG&E and the NRC Director of Inspection and Enforcement and the NRC Regional Administrator is scheduled to take place in the near future. PG&E should lose no time in acting to restore confidence in its integrity.

As for Dr. Cloud, we cannot, in my view, simply ignore the fact that he also had an obligation to inform the NRC that his draft reports were being reviewed by PG&E. Again, it is not the circulation of the report which is of concern, but the failure to disclose the interactions between Dr. Cloud's firm and PG&E when the question was raised by NRC. The only reasonable course, at this point, is to regard his report as, in effect, a PG&E report and to look to someone else to perform the independent audit of the reverification program.

FURTHER REMARKS OF CHAIRMAN PALLADINO

In response to Commissioner Gilinsky's remarks, I would point out that a notice of violation for a material false statement was issued against the Company regarding its statements at the November 3 meeting. Thus, the Commission did not let this Company's conduct go unnoticed or unsanctioned.

With regard to Dr. Cloud, the Commission did not ignore his conduct; rather it decided that Dr. Cloud should not be eliminated based on the results of the Phase I and Phase II investigations of the November 3 meeting and hence took no action at that time.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS

Nunzio J. Palladino, Chairman
Victor Gilinsky
Peter A. Bradford
John F. Ahearne
Thomas M. Roberts

In the Matter of

Docket No. 40-2061

KERR-McGEE CORPORATION
(West Chicago Rare Earths
Facility)

February 11, 1982

The Commission denies petitions requesting a formal adjudicatory hearing on a materials license amendment (granted September 28, 1981) permitting licensee to demolish certain buildings on its West Chicago site and receive for temporary onsite storage a small quantity of thorium ore mill tailings.

**RULES OF PRACTICE: NOTICE OF PROPOSED ACTION OR
OPPORTUNITY FOR HEARING**

The Commission is required to issue a notice of proposed action, or notice of opportunity for hearing, only with respect to an application for a facility license, an application for a license to receive radioactive waste for commercial disposal, an application to amend such licenses where significant hazards considerations are involved, or an application for "any other license or amendment as to which the Commission determines that an opportunity for public hearing should be afforded." 10 CFR 2.105(a).

RULES OF PRACTICE: NOTICE OF HEARING

The Commission has no duty under its regulations to issue a notice of hearing under 10 CFR 2.104 unless (1) a hearing is mandated in even an uncontested case by either section 189a of the Atomic Energy Act, or 10 CFR Chapter 1; (2) it has issued a notice of proposed action or notice of

opportunity for hearing under 10 CFR 2.105 and a party has responded to the notice; or (3) the Commission determines that the public interest requires a hearing. 10 CFR 2.104.

ATOMIC ENERGY ACT: HEARING REQUIREMENT (MATERIALS LICENSE)

Section 189a of the Atomic Energy Act does not require the formal, trial-type hearing specified by §554 of the Administrative Procedure Act for every single Commission licensing proceeding. In the case of materials licenses, the Commission has the legal latitude to use informal procedures sufficient to fully apprise it of the concerns of a party challenging the licensing action and to provide an adequate record for determining their validity.

ATOMIC ENERGY ACT: RIGHT TO HEARING

Even in licensing cases where section 189a requires a trial-type hearing, a person requesting a hearing must make some threshold showing that a hearing would be necessary to resolve opposing and supported factual assertions.

RULES OF PRACTICE: DUE PROCESS

Constitutional due process is not violated in a materials license amendment proceeding where an opposing party has adequate opportunity to present and support its objections; the factual issues involved are of a technical nature; questions of credibility or veracity are not raised; that party is represented by experienced counsel; and additional procedures are unlikely to aid the fact-finding process or result in a better record for agency review, but rather would create an increased government burden.

NUCLEAR REGULATORY COMMISSION: ENVIRONMENTAL RESPONSIBILITIES (LICENSE AMENDMENTS)

Under NRC regulations, an environmental impact statement (EIS) or a negative declaration that an EIS will not be prepared, with an environmental impact appraisal supporting that determination, need not be prepared if a license amendment is considered by the agency to be

nonsubstantive or insignificant from the standpoint of environmental impact. 10 CFR 51.5(d)(4).

NEPA: PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT (SEGMENTATION)

An agency may authorize an individual, sufficiently distinct portion of an agency plan without awaiting the completion of a comprehensive environmental impact statement on the plan so long as the environmental treatment under NEPA of the individual portion is adequate and approval of the individual portion does not commit the agency to approval of other portions of the plan. *Kleppe v. Sierra Club*, 427 U.S. 390, 407 n.16, 414 n.26 (1976); see *Peshlakai v. Duncan*, 476 F. Supp. 1247, 1260 (D.D.C. 1979); *Conservation Law Foundation v. GSA*, 427 F. Supp. 1369, 1374 (D.R.I. 1977).

NUCLEAR REGULATORY COMMISSION: EFFECT OF CONCURRENT STATE OR LOCAL PROCEEDING

The potential for an action by a state or local regulatory authority that will affect a facility seeking an NRC license normally is not sufficient reason for the Commission to stay its licensing action pending the outcome of any proceeding to impose additional requirements. See *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), ALAB-189, 7 AEC 410, 412 (1972). Rather, it is the prerogative of the other governmental entity asserting jurisdiction to take whatever measures it deems appropriate to enforce its regulatory authority. See *Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant, Units 1 and 2), ALAB-443, 6 NRC 741, 748 (1977).

ORDER

Currently pending before the Commission are four petitions docketed with the Office of the Secretary on October 28, 1981, by the City of West Chicago (City). In these petitions, the City, asserting the status of an interested person under section 189a of the Atomic Energy Act, 42 U.S.C. §2239(a), seeks to invoke 10 CFR §§2.104 and 2.105 to obtain a formal adjudicatory hearing under section 554 of the Administrative Procedure Act, 5 U.S.C. §554. The subject of that hearing is to be the request by Kerr-McGee Corporation (Kerr-McGee) for an amendment to its 10 CFR Part 40 license for its Rare Earths Facility, a now-inactive thorium ore milling facility located in West Chicago, Illinois. That amendment, which

was granted by the NRC staff on September 28, 1981,¹ would allow Kerr-McGee to demolish certain buildings on its West Chicago site and to receive onsite for temporary storage a small quantity of mill tailings now located at various spots in the City of West Chicago. For the reasons more fully stated herein, the Commission holds that in this instance, neither NRC regulations nor section 189a of the Atomic Energy Act nor constitutional due process concerns compel the convening of a formal adjudicatory hearing and that, on the basis of the various filings of the City and Kerr-McGee and the existing documents contained in the public docket concerning the West Chicago facility, the staff's original action in granting the amendment was proper and should remain in effect.

BACKGROUND

The West Chicago Rare Earths facility now in question began operations in 1932 and produced chemical compounds containing thorium, a naturally occurring radioactive element, and rare earth elements. Under the Atomic Energy Act of 1954, 42 U.S.C. §2014(z), the Atomic Energy Commission was authorized to license "source material" use in facilities, including the production of thorium, and in 1956 the West Chicago facility was granted an AEC license. Kerr-McGee acquired the facility in 1967 and continued operations until 1973. At present there is waste material onsite that consists of building rubble, contaminated soil, and tailings from the milling of the thorium ore that, depending on their thorium content, would be considered either "source material" or "byproduct material" subject to NRC licensing authority.² As now effective, the Kerr-McGee license authorizes only the possession and storage of thorium ores.

An initial Kerr-McGee plan for the burial of the onsite wastes was submitted to NRC in October 1975, but subsequently was withdrawn in late 1976 in response to the concerns expressed by representatives of NRC and the State of Illinois. Since 1976, the NRC has been working with

¹ The NRC staff's determination in this regard was made in accordance with 10 CFR §§2.100, 2.103, which delegates to the staff the authority to issue materials license amendments.

² "Source material" is defined in section 11 of the Atomic Energy Act of 1954, 42 U.S.C. §2014(z), as "(1) uranium, thorium, or any other material which is determined by the Commission pursuant to the provisions of section 61 to be source material; or (2) ores containing one or more of the foregoing materials, in such concentration as the Commission may by regulation determine from time to time." In the same section, "byproduct material" is defined as "(1) any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material, and (2) the tailings or wastes produced by the extraction or concentration of radium or thorium from any ore processed primarily for its source material content." *Id.* §2014(e).

Kerr-McGee, Argonne National Laboratory, and State and local representatives to define the safety and environmental impacts of the site and to determine disposition of the wastes. In July 1977 Kerr-McGee agreed to produce a full decommissioning plan for the facility and finally did so, in response to an NRC order of November 16, 1978, on December 21, 1978. After receiving public comments on the plan, on April 10, 1979, NRC requested that Kerr-McGee submit a revised plan that was sufficiently detailed to permit NRC to prepare an environmental impact statement. The revised plan, which was submitted to NRC on August 15, 1979, covered a wide range of topics involved in decommissioning the Rare Earth Facility, including demolition of the existing buildings onsite. As it is pertinent to the amendment now before the Commission, the revised plan stated:

Dust Abatement:

A dust abatement system using fog nozzles will be constructed. A portion of the floor of the north end of Building No. 9 will be removed and a lagoon will be dug. This lagoon will be lined with a double plastic liner to contain water and preclude percolation. The fog nozzle system will be a pressure fed, gravity flow drainage and filtration system. The fog nozzle system will be employed in demolition of portions of buildings which are the most radioactive and prone to generate dust. Water will be neutralized to precipitate contaminants, and filtered. Water will meet release requirements for radiational chemical pollution.

Subsequently, the plan was distributed to the general public, discussed with the West Chicago City Council on August 6, 1979, and was the subject of a public meeting on August 8, 1979. In November 1979 additional comments from federal, State, and local officials were submitted to Kerr-McGee, to which it responded by letter dated April 29, 1980.

As set forth in the Kerr-McGee stabilization plan, the first phase of the plan was to involve site preparation. Specifically, under Phase 1-A of the plan certain housekeeping tasks that had to be performed under any of the existing decommissioning alternatives were to be undertaken. Specifically, those tasks included start-up operations such as personnel training and construction of office and communications facilities; a thorough cleaning of the buildings and grounds; the pickup of scattered debris, loose metals, and organic materials; the disassembly of secondary structures (*e.g.*, pipes and nonload bearing walls) within the buildings; and the dismantling of the wooden exteriors from certain of the buildings. These activities were not to commence until a radiological health physics plan had been submitted to and approved by the NRC.

The health physics plan was submitted on July 31, 1979. By letter dated August 16, 1979, the NRC staff requested further information or clarifications concerning portions of the proposed health physics plan. That information was supplied by Kerr-McGee on August 23, 1979, and on August 29 the NRC staff approved the health physics plan as updated, with certain additional commitments imposed on Kerr-McGee. As approved, the health physics plan called for industrial cleaning of the factory site buildings by:

- a. Sweeping with industrial sweeping compounds,
- b. Wet scrubbing—(except during Phase I-A),
- c. Vacuum cleaning.

The health physics plan also stated that secondary structures in the buildings would be decontaminated using dry cleaning methods or, if radioactivity levels could not be decreased, painting the walls to fix the radioactivity. Finally, the plan indicated that cleanup activities would be conducted in accordance with industrial safety criteria.

On December 6, 1979, the NRC issued a "Notice of Availability of Stabilization Plan and Intent to Prepare a Draft Environmental Impact Statement" concerning approval of a plan to decommission the West Chicago facility, which was published in the *Federal Register*, 44 *Fed. Reg.* 72246 (Dec. 13, 1979). Preparation of that environmental impact statement is continuing and it is expected a draft will be issued in late April or May of 1982, with public comments to follow. After a final environmental impact statement has been prepared, NRC then will be in a position to fully assess what should be the final disposition of the wastes present at the West Chicago facility and can act to amend Kerr-McGee's license to require that the proper decommissioning actions be undertaken to achieve that end.

With regard to the particular circumstances of the portion of the September 28, 1981 amendment to Kerr-McGee's license permitting the demolition of six of the buildings onsite, on March 28, 1980, Kerr-McGee submitted a request to the NRC for permission to demolish Building No.

1. In pertinent part that request provided:

Kerr-McGee requests that NRC approve, as early as possible, razing of Building No. 1 at its West Chicago facility prior to final approval of the entire Stabilization Plan. The work would be conducted as described in the Stabilization Plan except for two points:

1. Water used in the dust abatement system will be contained in the North portion of Building No. 3 by use of existing floor trenches and stored in available tanks. Otherwise, the water will be treated as described in the Plan.

2. Building rubble that is designated in the Stabilization Plan to be contained at the Disposal Site would be stored in other factory buildings and the floor would remain in place to control erosion. Following approval of a Stabilization Plan, the floor will be removed and all material stored in the factory buildings will be disposed of in accordance with the Stabilization Plan.

On March 25, 1981, a similar letter requested permission to raze Building No. 3. As it is relevant here, it stated:

On March 28, 1980, Kerr-McGee submitted a letter requesting approval to dismantle Building No. 1. This request is still under review.

We now request approval to proceed with dismantling Building No. 3 and its auxiliary structures [which] are identified on the attached property plan. The work would be conducted as described in the Stabilization Plan except for two points:

1. Water used in the dust abatement system will be contained using existing floor trenches in the area of Building No. 3 and stored in available tanks. Otherwise, the water will be treated as described in the Plan.
2. Building rubble that is designated in the Stabilization Plan to be contained at the Disposal Site would be stored in other factory buildings and the floor would remain in place to control erosion. Following approval of a Stabilization Plan, the floor will be removed and all material stored in factory buildings will be disposed of in accordance with the Stabilization Plan.

Noting that Buildings Nos. 1 and 3 were in a bad state of repair such that disassembly was necessary to avoid accidental collapse, that the health physics and personnel training programs of Kerr-McGee were suitable to avoid any adverse radiological impact offsite, and that all materials from the razed buildings would remain onsite, on April 24, 1981, the NRC staff granted these requests as Amendment No. 1 to Kerr-McGee's existing Part 40 license.³ In pertinent part that amendment provided:

In accordance with your requests of March 28, 1980, and March 25, 1981, and pursuant to Title 10, Code of Federal Regulations, Part 40, Source Material License No. STA-583 is hereby amended to authorize dismantling buildings 1, 3, 3A, 3B, 3C, 3D,

³ In granting this and subsequent amendments to Kerr-McGee's 10 CFR Part 40 license, NRC regulations require that the NRC staff consider if:

- (a) The application is for a purpose authorized by the [Atomic Energy] Act; and
- (b) The applicant is qualified by reason of training and experience to use the source material for the purpose requested in such manner as to protect health and minimize danger to life or property; and

(CONTINUED)

3E and 3F at the West Chicago Site subject to the following conditions:

Kerr-McGee shall ensure that the dismantling activities are performed in accordance with applicable provisions of the plan submitted on July 31, 1979 as modified by your letter of August 23, 1979, the provisions in Attachment A of the August 29, 1979 letter referenced above, and your letters of March 28, 1980 and March 25, 1981.

The City, being fully apprised of these amendment requests, raised no objection to the amendments and demolition proceeded.⁴

On August 4, 1981, Kerr-McGee submitted another request to the NRC concerning building demolition, this time seeking permission to disassemble six of the other buildings onsite. In its letter of request, Kerr-McGee stated:

Kerr-McGee is continuing work at its West Chicago facility under Phase I-A of the Stabilization Plan submitted to NRC on August 15, 1979 and on dismantling of buildings No. 1 and No. 3 under NRC approval letter of April 24, 1981. We presently project completion of the dismantling work on buildings No. 1 and No. 3 by early November, 1981.

We now request approval to be granted to commence dismantling additional buildings and structures at the facility. The buildings and structures we now request approval to dismantle are identified as Buildings 2B, 4, 5, 6, 7, 8, including auxiliary structures and the water tower. The buildings are identified in the shaded area on the attached property plan. The dismantling work would be carried out in the same manner as presently being done on Buildings No. 1 and No. 3.

-
- (c) The applicant's proposed equipment, facilities and procedures are adequate to protect health and minimize danger to life or property; and
 - (d) The issuance of the license will not be inimical to the common defense and security or to the health and safety of the public . . .

10 CFR §40.32. It should be noted, however, that in this instance, which involves no concern over import or export of nuclear materials, common defense and security considerations under section 40.32(d) are not implicated.

⁴ By letter dated June 4, 1979, the City was informed by the NRC staff that it was being placed on a mailing list for the Rare Earth Facility and would receive copies of all correspondence and notices relating to the facility.

While the City has indicated otherwise with regard to the demolition contemplated under Amendment No. 3, it apparently was in agreement that the dismantling work under Amendment No. 1 should be undertaken. See Exhibit C to Verified Response of Defendant Kerr-McGee Chemical Corp. to Temporary Restraining Order, No. 81 C 5743 (N.D. Ill. filed Oct. 15, 1981) (transcript of May 20, 1981 television news report in which Mayor of West Chicago indicated support of building demolition begun under Amendment No. 1).

On September 23, the NRC staff wrote Kerr-McGee that its request had been granted as Amendment No. 3 to the license. In the background memorandum concerning Amendment No. 3, the NRC staff indicated that its conclusion was based on its earlier review of the identical Kerr-McGee plans for Amendment No. 1 concerning project management, radiological health and safety, and employee training *as well as* a site visit by NRC Headquarters personnel and discussions with NRC Region III inspectors, who had made approximately twenty site visits between January and mid-September 1981 to review Kerr-McGee's proposed procedures and to view demolition in progress. In support of its conclusion, the staff noted that destruction of the buildings raised no problems beyond those involved in demolishing Building No. 3, which had been successfully completed; that onsite storage for the materials for the six buildings was sufficient; and that no significant offsite impacts were detected during Building No. 3's demolition. Accordingly, the staff having determined that Kerr-McGee's health physics practices and controls were good and that it was conducting the demolition work in a safe manner,⁵ Amendment No. 3 allowing disassembly of the six additional buildings was granted as follows:

- A. In accordance with your request of August 4, 1981, and subject to the following conditions, authorization is hereby granted for the dismantling of Buildings 2B, 4, 5, 6, 7 and 8, including auxiliary structures and the water tower:

.

2. Kerr-McGee shall ensure that the dismantling activities are performed in accordance with applicable provisions of the plan submitted on July 31, 1979 as modified by your letter of August 23, 1979, the provisions in Attachment A of the August 29, 1979 letter referenced above, and your letters of March 28, 1980 and March 25, 1981.

The September 28 letter also granted an amendment for Kerr-McGee to "receive and store soil which may contain source or by-product material and which originates from the Illinois State program to remove contaminated soil from discrete areas in West Chicago." The materials located offsite were removed from the West Chicago facility prior to 1950, apparently by local citizens, for use as fill materials. Approximately seventy-five sites containing the ore residues have been pinpointed. The NRC staff concluded that the residues were not of a concentration that would constitute a danger to the public health and safety and accordingly there was no need for the agency to assert licensing authority over them. The State of Illinois Department of Public Health, Division of Nuclear Safety had,

⁵ See note 3 *supra*.

however, developed a program for gathering the materials, which are estimated to amount to a fraction of one percent of the five million cubic feet of material now located on the Kerr-McGee West Chicago site.⁶

During a site visit by NRC officials on September 8, 1981, a Kerr-McGee official indicated to the NRC staff that Illinois State officials involved with the cleanup plans had asked Kerr-McGee if it would accept the contaminated soil and that Kerr-McGee would like a license amendment to do so, if required.⁷ In analyzing this request in the background memorandum accompanying Amendment No. 3, the NRC staff found that the receipt of the soil from the State of Illinois would present no unusual technical problems or safety, health, or environmental concerns, and would not increase the problems of decommissioning and storage or disposal of wastes. The amendment to receive these wastes was granted, in conjunction with that concerning building demolition, subject to the condition that all vehicles or other equipment coming onsite to deliver the soil be decontaminated in accordance with certain additional NRC requirements.

On October 14, 1981, the City instituted suit in the United States District Court for the Northern District of Illinois against Kerr-McGee and the NRC to challenge the issuance of Amendment No. 3.⁸ Acting upon the City's request for temporary injunctive relief, on October 21, 1981, a federal judge enjoined the effectiveness of the amendment in order to allow the City to submit, and the Commission to consider, the City's contentions concerning the license amendment.⁹

On October 28, 1981, the City docketed with the Office of the Secretary four petitions that challenged the staff's issuance of the license amendment concerning the building demolition and storage of the offsite thorium and requested a formal adjudicatory hearing pursuant to 10 CFR §§2.104 and 2.105 to air its concerns. In its petitions, the City made numerous broad, though unsupported, allegations concerning the propriety of the building demolition and the receipt of the offsite material. On November 5, 1981, the Secretary of the Commission sent a letter to

⁶ Because the material offsite presents no hazard of consequence to public health and safety, and as a matter of comity, the NRC staff determined that licensing of the State of Illinois to transport the offsite material would be an unnecessary burden.

⁷ On November 10, 1981, this oral request for an amendment was confirmed in writing by letter from Kerr-McGee Vice President W. J. Shelley to the NRC staff.

⁸ The City asserted that it had no notice of the pendency of the Kerr-McGee requests to demolish the buildings or receive the offsite material onto the site and thus was deprived of any opportunity to request a hearing prior to the issuance of Amendment No. 3. The NRC asserted that the City had actual notice of both Kerr-McGee requests prior to the issuance of the amendment and, in any event, the City was not entitled to a hearing prior to issuance of the amendment.

⁹ A motion filed by the NRC to dismiss this suit for lack of subject matter jurisdiction is now pending before the court.

counsel for the City and Kerr-McGee requesting that by November 13 the City submit to the Commission, and serve upon Kerr-McGee, any additional information or arguments it desired the Commission to consider in connection with the license amendments. Kerr-McGee was to respond to the City's filing by October 28.

On November 12, 1981, the City responded to the Secretary's letter. It asserted that the Secretary's request for additional information was improper under the NRC's regulations and that, in any event, the request for additional information constituted a grant of its request for a hearing. In addition, the City submitted a list of contentions for Commission consideration. These contentions included:

1. An environmental impact statement is required prior to demolition of the buildings and storage of the offsite thorium.
2. The Kerr-McGee proposed decommissioning plan requires that a water fog system be used for dust abatement during demolition of any buildings and this was not being done, as is indicated by insufficient water consumption.
3. The Kerr-McGee proposed decommissioning plan requires that a lagoon be built to hold the water utilized in a dust abatement system to prevent it from entering the sewer system and this has not been done.
4. Kerr-McGee has not obtained the necessary building demolition permits from the City.
5. Demolition of the buildings and incorporation of the radioactive waste therefrom on the Kerr-McGee site is in violation of a July 22, 1981 staff paper to the Commission discussing proposed criteria for disposal or onsite storage of thorium or uranium wastes.
6. The failure of the NRC to require Kerr-McGee to follow the conditions of its proposed decommissioning plan sets an unnecessary precedent for future Kerr-McGee failures to follow the plan.

By letter dated November 18, 1981, Kerr-McGee responded to the City's November 12 filing. Kerr-McGee questioned the applicability of 10 CFR §§2.104 and 2.105 to the City's hearing requests in the absence of a Commission finding that a hearing was "in the public interest." Kerr-McGee also challenged the need for an environmental impact statement with regard to the demolition of the building, the need for a city demolition permit, and the need for Kerr-McGee to follow exactly the provisions of the proposed decommissioning plan that has not yet been approved by the NRC. Kerr-McGee also asserted that the City's contentions with regard to the inadequacy of the dust abatement program were invalid as unsupported by any evidence. Finally, Kerr-McGee indicated it

did not oppose the City's request for a formal hearing, so long as that hearing was expedited.

By letter dated November 25, 1981, the Secretary again wrote counsel for both the City and Kerr-McGee to request additional information. The Secretary's letter indicated that by December 4, 1981, Kerr-McGee was to present the Commission and the City with any information it relied upon to support its disagreement with the City's assertions in its November 5, 1982 filing that the dust abatement system was inadequate and that a lagoon was required but had not been built. The City was to respond to that filing on or before December 11, 1981.

In its December 4, 1981 response, Kerr-McGee asserted that it was not required to use any specific water fog or dust abatement system. According to Kerr-McGee, under Amendment No. 1 it was authorized to demolish Buildings Nos. 1 and 3 and in this process it prepared detailed engineering procedures to guide demolition programs prior to beginning dismantling activities. In seeking authorization for the additional buildings, Kerr-McGee stated, it indicated it would do the dismantling work in the same manner as was done under Amendment No. 1. These detailed engineering procedures require that prior to demolition, the entire area to be dismantled is to be thoroughly cleaned by vacuuming or other methods. Then, depending on the character and location of the building, either a fine water mist is used to dampen the material prior to and during demolition or a standard "fire-fighting" type foam is applied to brick and masonry surfaces to contain dust and radioactive particulates. After demolition, the areas involved are cleaned again using dry floor cleaning compounds and water mist sprays to control dust. Kerr-McGee also explained that there has not been an insufficient supply of water to the site because large doses of water have not been necessary. Further, Kerr-McGee asserted that attached copies of data from eight perimeter air particulate sampling stations taken between January 1981 and October 1981 showed no detectable increase in airborne radioactivity to unrestricted areas from the demolition program, indicating the effectiveness of its dust abatement measures.

As to the City's assertion that a lagoon was required to be constructed and utilized as part of the dust abatement program to prevent the discharge of radioactive material into the City's sewer system, Kerr-McGee stated that the use of strict dismantling procedures, cleaning, and the use of fine water mists and foam had reduced the use of water and resulted in little or no runoff to the trenches used to route the water from the demolition of Buildings Nos. 1 and 3. As further proof of the viability of its existing procedures for capturing water runoff resulting from the demolition procedures, Kerr-McGee attached water discharge monitoring data that it declared showed no detectable increase in radioactivity due to

the dust abatement program. Kerr-McGee indicated that the data was gathered by equipment located in the sump of one of the buildings onsite from which, it asserted, any releases to the sewer system would have occurred. Kerr-McGee noted that its request for approval of Amendment No. 1 advised that water used in the dust abatement system would be contained using those existing floor trenches and would be stored in available tanks. Kerr-McGee asserted that for the additional demolition under Amendment No. 3 it plans and was authorized to use those existing trenches to route any water to an existing poured concrete storage vault. It stated that it would continue to monitor this water and keep any discharges from the vault within regulatory limitations. Finally, Kerr-McGee stated that the proposed decommissioning plan did not establish a requirement for a lagoon because the plan was not yet approved.

In response to Kerr-McGee's filing, the City lodged a letter with the Commission that again questioned the agency's right to request information prior to granting a formal hearing. The City also noted its objection to what it described as the NRC's acquiescence in a piecemeal approach to the decommissioning plan by approval of certain Kerr-McGee activities prior to final approval of the entire plan. The City further asserted that the language of Amendment No. 1 for the demolition of Buildings Nos. 1 and 3 did not authorize Kerr-McGee to use any dust abatement system other than the water fog system described in the proposed decommissioning plan. Further, the City asserted that the amendment could not issue because all the decommissioning procedures actually used by Kerr-McGee with regard to Buildings Nos. 1 and 3 and proposed to be used regarding Amendment No. 3, along with the data submitted by Kerr-McGee to show the effectiveness of those procedures, have never been explained in detail or submitted for full public examination and comment. The data were also of no significance, according to the City, because they relate to Amendment No. 1, rather than the demolition proposed for the additional six buildings.

It is against this factual backdrop that the City's contentions concerning its right to a hearing and the propriety of issuing the amendment must be considered.

NRC REGULATIONS DO NOT AFFORD THE CITY A RIGHT TO A FORMAL HEARING

In responding to the Commission's request for information, the City repeatedly asserted that the Commission's regulations, 10 CFR §§2.104 and 2.105, mandate that it be given a formal hearing in line with the procedures set out in 10 CFR Part 2, Subpart G. It is apparent that there is no merit to this argument.

As the opening sentence of section 2.104 states, a notice of hearing will be issued “[i]n the case of an application on which a hearing is required by the [Atomic Energy] Act or this chapter [*i.e.*, 10 CFR Chapter 1] or in which the Commission finds that a hearing is required in the public interest” The City argues that the Commission must issue a notice of hearing in accordance with that rule because section 189a of the Atomic Energy Act requires a hearing upon request of an interested party such as the City. However, the City’s interpretation of the phrase “required by the Act” in section 2.104 is incorrect. The Commission interprets section 2.104 to mean that only for certain construction permit applications is a hearing “required” by the Atomic Energy Act; that is, the phrase “required by the Act” is limited to a situation in which Section 189a of the Atomic Energy Act, as we discuss in more detail in the next section of our order, mandates a hearing *regardless* of whether an application will be contested.¹⁰ Furthermore, nothing in 10 CFR Chapter 1 requires — in the sense of mandating, even absent a request for a hearing — a hearing on materials license amendment applications of the sort proffered here. Finally, section 2.104 leaves open the possibility that in certain instances the Commission may find that the public interest requires a hearing, even absent a request for such. It will be clear from our discussion of the facts in this case that the Commission has not made that “public interest” finding in connection with the Kerr-McGee amendment application in question.

The City also relies upon section 2.105 to support its argument that the Commission must grant it a formal hearing. However, by its very terms, section 2.105 requires that the Commission issue a notice of proposed action — also called a notice of opportunity for hearing — only with respect to an application for a facility license, an application for a license to receive radioactive waste for commercial disposal, an application to amend such licenses where significant hazards considerations are involved, or an application for “any other license or amendment as to which the Commission determines that an opportunity for public hearing should be afforded.” 10 CFR §2.105(a)(6). The Kerr-McGee amendment does not fall into any of these categories. Although City has cited specifically to the disposal provision of this rule, the City has misconstrued this provision, which relates only to attempts to obtain a license for a commercial waste disposal site, such as at Hanford, Washington, or Barnwell, South Caro-

¹⁰ It should also be noted that section 2.104(b), which makes reference only to construction permit applications, uses the phraseology “on which the Act requires a hearing; in contrast, section 2.104(c), which concerns only operating licenses, talks only in terms of applications “in which a hearing will be held.” This further supports the interpretation that when section 2.104 refers to “an application on which a hearing is required by the Act,” the reference is to certain types of construction permit applications.

lina. Furthermore, for reasons stated elsewhere in this opinion, it is obvious that this is not an "amendment as to which the Commission [has] determine[d] that an opportunity for public hearing should be afforded."

In sum, we believe that the City has misconstrued the Commission regulations. In the ordinary course of affairs the Commission will first issue a notice of proposed action or notice of opportunity for hearing under section 2.105 with regard to the licenses and amendments covered thereby.¹¹ The Commission has no duty under its regulations to issue a notice of hearing under section 2.104 *unless* a party has responded to the notice of proposed action or notice of opportunity for hearing issued under section 2.105, *see* 10 CFR §2.105(e), or *unless* the Atomic Energy Act or 10 CFR Chapter 1 mandates a hearing in even an uncontested case. The conditions following the second "unless" do not apply here, as discussed, because this case does not involve a construction permit for a facility for which section 189a or our rules mandate a hearing in even uncontested cases; the condition following the first "unless" does not apply because this case does not involve any license or amendment situation mentioned in section 2.105 for which the Commission must issue a notice of proposed action. The City cannot short-circuit this process by requesting a formal hearing when it has not been offered the right to do so by the rules. Although the Atomic Energy Act allows the City to request a hearing, our conclusion here is that there are no NRC regulations which require that we commence the *formal* hearing process which is triggered by a section 2.104 notice of hearing or section 2.105 notice of proposed action. *See* 10 CFR §2.700. Because those regulations do not apply here, we must go to section 189a of the Atomic Energy Act and the Constitution to see if either requires that the City get a hearing under section 554 of the APA.¹²

¹¹ *See* 37 *Fed. Reg.* 15127, ¶ 1 (July 28, 1972), which refers to situations in which each type of notice is usually given. Where the Atomic Energy Act mandates a hearing even absent any contest or request, there is little sense in first issuing a notice of proposed action under section 2.105 because a notice of hearing will have to issue under section 2.104 in any case; the Kerr-McGee amendment is not such a case. Thus, the only question under our regulations is whether section 2.105 requires a notice of proposed action which is the only other mechanism that automatically triggers the section 2.104 notice of hearing that the City seeks; as we have held, it does not.

¹² Although the Commission has, in the past, provided formal hearings on materials license cases, the Commission is not foreclosed from a different result here. Many of the hearings were granted under since-repealed AEC regulations which provided for such hearings. *See* 10 CFR §§2.102, 2.708, 21 *Fed. Reg.* 804 (Feb. 4, 1956). Although the Commission has granted formal hearings since the repeal of the earlier regulations and the adoption of 10 CFR §§2.104 and 2.105 in 1962, 27 *Fed. Reg.* 377 (Jan. 13, 1962), such grants were a matter of policy and convenience. Recently, however, Commission licensing boards have found themselves backlogged and overworked on facilities licenses and amendments. Moreover, the combination of promotional and regulatory duties which led the AEC to extensively judicialize its procedures, with the hope of dispelling public doubt about the agency's alleged conflict of interest, no longer exists. Finally, the novel technological and legal issues raised in

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THE ATOMIC ENERGY ACT OF 1954 DOES NOT REQUIRE A TRIAL-TYPE HEARING UNDER §554 OF THE APA

Under section 5 of the Administrative Procedure Act, 5 U.S.C. §554, the formal hearing procedures set forth in APA sections 7 and 8, 5 U.S.C. §§556, 557, are applicable only if the adjudication in question "is required by statute to be determined on the record after opportunity for an agency hearing . . ." The City has argued that it is entitled to a formal hearing, pursuant to 5 U.S.C. §554, under section 189a of the Atomic Energy Act of 1954, as amended, 42 U.S.C. §2239(a).¹³ Section 189a states, in relevant part:

In any proceeding under this Act, for the granting, suspending, revoking or amending of any license . . . the Commission shall grant a hearing upon the request of any person whose interest may be affected by the proceeding, and shall admit any such person as a party to such proceeding.

Although the statute explicitly requires a "hearing," the Commission does not read section 189a as requiring a section 554 hearing in every single licensing proceeding and, in this case, the Commission believes the statute may properly be read to deny such a hearing.

On its face, section 189a does not indicate what type of hearing must be granted to interested persons. The legislative history of the 1954 Atomic Energy Act is unilluminating on this question.¹⁴ That history does show,

licensing cases 20 years ago — particularly in materials license cases — are surely less novel on the whole. Given our changed regulations, and changed conditions at the agency and in the industry, there is reason for us to forego providing formal hearings in materials licensing cases like this one. *See Bell Telephone Co. v. FCC*, 503 F.2d 1250, 1264-65 (3d Cir. 1974).

¹³ Under section 181 of the Atomic Energy Act of 1954, as amended, 42 U.S.C. § 2231, it is stated that "[t]he provisions of the Administrative Procedure Act . . . shall apply to all agency action taken under this Act . . ." It is well recognized, however, that the applicability of the APA in a specific instance turns on that act's requirements, see *Siegel v. AEC*, 400 F.2d 778, 785 (D.C. Cir. 1978), which in this instance affords a formal hearing only when the agency's statute requires a hearing "on the record." Further, the inclusion of this provision appears to have reflected a congressional concern that, with regard to proceedings involving restricted or defense (and later safeguards) information to which the APA would otherwise apply, there be parallel procedures except to the extent necessary to protect against the wrongful dissemination of the sensitive data. *See* 100 Cong. Rec. 10171 (July 16, 1954).

¹⁴ In the course of the congressional debates on the Atomic Energy Act, Senator Anderson, commenting on a proposed version of the 1954 Act that did not include section 189a, stated that if the AEC were "to grant a license in this very important field, where monopoly could so easily be possible, I think a hearing should be required and a formal record should be made regarding all aspects . . ." 100 Cong. Rec. 10000 (July 14, 1954). He argued that the bill only made the Administrative Procedure Act applicable to the AEC, but that the APA did not, by itself, require formal hearings. *Id.* The bill provision criticized by Senator Anderson provided that "upon application, the Commission shall grant a hearing to any party

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however, that Congress' overwhelming concern was with facilities licenses, as opposed to source, special nuclear, and byproduct materials licenses that were virtually ignored in congressional reports and legislative debate. In adopting rules to carry out the Act, the AEC did provide for formal hearings in all licensing cases upon request of intervenors or applicants, or upon its own motion. 10 CFR §§2.102, 2.708, 21 *Fed. Reg.* 804 (Feb. 4, 1956). The agency did not state whether it was providing such hearings in its discretion or as a matter of statutory mandate. When section 189a was amended in 1957 to require "mandatory" hearings on even uncontested construction permit or operating license applications for certain facilities prior to the grant of these applications, once again the type of hearing to be held was left open.¹⁵ Nonetheless, the AEC continued to hold formal hearings in all licensing cases.

In December 1960, in response to a letter from the Joint Committee on Atomic Energy requesting an AEC reply to the charge that license hearing procedures were "unnecessarily formal and judicialized," the agency replied that it did "not exclude the possibility of future modification of the method of conducting the hearings in the direction of greater informality."¹⁶ With particular reference to only power or test reactors, the AEC also noted an earlier Joint Committee staff study, which preceded the 1957 amendments to the Atomic Energy Act, in which the Joint Committee staff stated that under guidelines recommended by the Attorney General of the United States, "the licensing of reactors could be considered to be of far-reaching importance to many interests and therefore to warrant formal public hearings."¹⁷ A few months later, the AEC presented a report to the Joint Committee in which it again summarized the charges of excessive formality in licensing cases, pointed to the lack of substantial experience in reactor licensing and the importance of the safety interests at stake, and concluded that "[i]t is possible that substantially less full presentation of

materially interested in any 'agency action.'" S. 3690, 83d Cong., 2d Sess. §181 (1954). Significantly, section 189a as subsequently adopted provided no more than section 181 criticized by Senator Anderson. The legislative history is also otherwise silent on whether a formal hearing under section 554 of the APA would be required. It must also be emphasized that the threat of "monopoly" is what triggered Senator Anderson's remarks, a threat which surely does not exist here.

¹⁵ Senator Anderson did repeat his 1954 remarks during the 1957 debate but, once again, little else was said. 103 Cong. Rec. 3616 (Mar. 21, 1957). Even if the 1957 amendments were premised on the need for formality, it must be emphasized that they dealt with only certain facilities licenses.

¹⁶ Letter from Loren K. Olson, AEC Commissioner, to James T. Ramey, Exec. Dir., Joint Comm. on Atomic Energy (Dec. 22, 1960), *reprinted in* 1 Staff of Joint Comm. on Atomic Energy, 87th Cong., 1st Sess., *Improving the AEC Regulatory Process* 588 (Comm. Print 1961) [hereinafter cited as *Improving the AEC Regulatory Process*].

¹⁷ Letter from Loren K. Olson, AEC Commissioner, to James T. Ramey, Exec. Dir., Joint Comm. on Atomic Energy (Nov. 30, 1960), *reprinted in* *Improving the AEC Regulatory Process*, *supra* at 580.

testimony would be appropriate in some cases after there has been more experience in the operation of large power and test reactors.”¹⁸ As to this critical category of licensees — *i.e.*, reactor licensees — soon after receiving the AEC report the Joint Committee staff published its own conclusion that the AEC “has gone further in some respects than the law required, particularly in regard to the number of hearings required and the formality of the procedures.”¹⁹ On the question of license amendments, the Joint Committee staff stated that “[o]nly occasionally will the matters at issue justify the time consuming, expensive business of preparing testimony and finding an opportunity to fit its presentation into a schedule of a busy hearing examiner”²⁰ As to materials licenses, the Joint Committee staff suggested that the AEC consider registration instead of licensing for many of the less hazardous sources, though it did recommend — as opposed to arguing that the Atomic Energy Act required — hearings before a hearing examiner in contested materials licensing cases.²¹ In June 1961, the Joint Committee held hearings to explore legislative improvements in the AEC regulatory program. A major debate ensued between witnesses who argued that section 189a of the Atomic Energy Act required the AEC to use formal hearing procedures in its licensing cases²² and those

¹⁸ Report on the Regulatory Program of the Atomic Energy Commission (Feb. 1961), reprinted in *Improving the AEC Regulatory Process*, *supra* at 410.

¹⁹ *Improving the AEC Regulatory Process*, *supra* at VIII.

²⁰ *Id.* at 54.

²¹ *Id.* at 73.

²² The requirement of a formal hearing was set forth by AEC Commissioner Olson, who appears to have based the AEC practice of providing for formal hearings upon congressional intent associated with the 1957 amendments. He stated:

[W]e recite from the 1957 hearings with respect to the mandatory hearing requirement in which the [AEC] report quoted extensively from the Attorney General's report and then went on to make clear in our opinion, by my interpretation, that you wanted a formal hearing of record.

I think that I would like to offer to submit for the record a memorandum opinion with respect to this since there seems to be considerable difference of opinion as to whether we were legally justified in placing upon the act the interpretation that we have up to date.

Radiation Safety & Regulations: Hearings before Joint Comm. on Atomic Energy, 87th Cong., 1st Sess. 382 (1961). The memorandum submitted by Commissioner Olson quotes tidbits from the 1954 and 1957 legislative history, all of which we believe can be said to be inconclusive on the issue of whether section 189a requires formal hearings. In any event, we emphasize that since the AEC justified requiring formal hearings under section 189a by heavy reliance on the legislative history of the 1957 amendments and on the broad public safety concerns with the new area of reactor licenses, we believe that it can reasonably be concluded that the Commission can adopt different procedures in materials license cases, where the 1957 legislative history is irrelevant and concerns over the newness of the technology involved and over safety are of a very different magnitude.

who insisted to the contrary.²³ Significantly, the Joint Committee membership, which authored the 1954 Act and the 1957 amendments, expressed no opinion on this critical question.

The debate over the statutory necessity for formality in licensing cases, specifically reactor cases, continued into 1962. At Joint Committee hearings to consider amendments to the Atomic Energy Act which would, *inter alia*, substitute three-member licensing boards for hearing examiners, the Joint Committee heard from two of its consultants, Professor David Cavers and William Mitchell, Esq., the latter a former General Counsel of the AEC. Although the consultants recommended retaining formal hearing procedures for reactors to which there was strong opposition, they seemed to suggest that the section 189a hearing requirement could be met with informal procedures and they recommended that Congress pass legislation stating that "the requirement of a hearing in section 189a . . . shall not be deemed to require a determination on the record after opportunity for agency hearing, within the meaning of section [554] of the [APA]."²⁴ When the Joint Committee proposed amendments to the Atomic Energy Act in 1962, which would establish licensing boards²⁵ and dispense with the

²³ Strong disagreement with the view expressed by Commissioner Olson came in the form of testimony from Professor Kenneth Culp Davis. He stated:

I do not agree with Commissioner Olson that the statute requires a trial-type of hearing

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I do not agree with Commissioner Olson about the interpretation of legislative history. In fact, I have gone over the legislative history very carefully and search for any words that indicate an intent that the hearing should be on the record. That is, that it should be a trial type of hearing. I find no such words

Radiation Safety and Regulation: Hearings Before Joint Comm. on Atomic Energy, 87th Cong., 1st Sess. 376, 386 (1961).

²⁴ *AEC Regulatory Problems Hearings before Subcomm. on Legislation of the Joint Comm. on Atomic Energy*, 87th Cong., 2d Sess. 57 (1962) [hereinafter cited as *AEC Regulatory Problems*]. It should be noted that part, but not all, of the consultants' conclusion is based upon the "initial licensing" exemption in sections 554, 556, and 557 of the APA which, by their very terms, requires less formal procedures in initial licensing cases. It appears, however, that the consultants were going beyond this exemption to argue that section 189a did not even require resort to those sections of the APA. See also *id.* at 33-35 (testimony of Herzel Plaine, American Bar Association).

²⁵ Section 191 of the Atomic Energy Act, 42 USC §2241, provides for the appointment of three-member licensing boards in lieu of the hearing examiner required by section 556 and 557 of the APA for formal adjudications. The opening words of section 191, "[n]otwithstanding the provisions of section 7(a) [i.e., 556(a)] and 8(a) [i.e., 557(a)] of the Administrative Procedure Act," do suggest that formal APA hearing procedures were applicable to AEC licensing cases. However, it is not clear that the Joint Committee, which used this language, believed that the use of the APA's formal procedures was required by the Atomic Energy Act; it may have been, for example, that the Joint Committee intended only to preempt any argument that having chosen to use section 554 procedures, the AEC was

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mandatory hearing requirement in uncontested operating license — but not construction permit — proceedings, it refused to add the provision recommended by its consultants; significantly, however, the Joint Committee report stated:

The AEC has contended that the type of hearing procedures followed by the Commission is required to carry out the intent of the 1957 amendments to the Atomic Energy Act and their legislative history as well as the Administrative Procedure Act.

To the extent that the legislative history of the 1957 amendments may not be clear, it is expressly stated here that the committee encourages the Commission to use informal procedures to the maximum extent permitted by the Administrative Procedure Act.

In this connection, the committee refers to the recent report by the Subcommittee on Administrative Practice and Procedure of the Senate Judiciary Committee . . . :

By now, it has become apparent that the adversary type of proceeding, resembling as it does the processes of the courts, does not lend itself to the proper, efficient, or speedy determination of issues with which the administrative agencies frequently must deal Questions relating to . . . licensing of atomic reactors . . . might better be resolved in some type of proceeding other than administrative "lawsuit" among numerous parties

Having pointed out the desirability of informal procedures, *and the legal latitude afforded the Commission to follow such procedures*, the committee does not believe it necessary to incorporate specific language in the legislation requiring informal procedures.

H.R. Rep. No. 1966, 87th Cong., 2d Sess. 6 (1962) (emphasis added). The proposed legislation passed, but, it must be noted, the AEC continued to provide for formal hearings in all reactor cases in which an intervenor requested a hearing. In light of the relative newness of the technology and the broad safety concerns associated with reactors, it is not surprising that

required to use them *en toto*. In any event, the consultants who authored the report behind the Joint Committee bill stated that the AEC had construed section 189a as requiring a formal hearing on power and test reactor license applications pursuant to the 1957 amendment. *AEC Regulatory Problems, supra* at 56. That amendment mandated a hearing, even in uncontested cases, by imposing a separate hearing requirement apart from the reference to the word "hearing" in the first sentence in section 189a. Thus, APA sections 7(a) and 8(a) may have been applicable pursuant to the second, separate reference to a "hearing" in section 189a, so that the "[n]otwithstanding" clause was necessary. Since materials license cases come under only the first sentence of section 189a. and given the history of the 1957 amendment and the 1962 adoption of section 191, we do not think that the "[n]otwithstanding" clause demonstrates a congressional intent to require formal APA procedures in materials licensing cases.

the agency failed to follow the Joint Committee's guidance in encouraging informal procedures in some cases. Perhaps more surprisingly, but understandably in light of having established this one form of hearing, the AEC also referred material licenses to hearing boards.

Given this history, we are unable to conclude that Congress intended, when it adopted section 189a in 1954, to require section 554 hearings for every single licensing case. Even if the 1957 amendments mandating hearings in uncontested reactor cases can be said to support this result for reactors, a different result can obtain for material licenses. Moreover, although legislative developments show that another basis for formal hearings in reactor cases was the AEC recognition of novel technological questions with wide-ranging safety concerns, the same argument was never made with regard to materials licenses. Given the uncertainty on the issue even as to reactor licenses, and in view of the Joint Committee's express recognition of the AEC's legal latitude to use informal procedures, we believe that the agency has gone beyond legal requirements under the Atomic Energy Act in providing formal hearings in materials license cases in the past and that it is reasonable to change that approach.²⁶

This interpretation is bolstered by the need for NRC flexibility in fashioning hearing procedures. Although the Commission can be said generally to deal with "nuclear" matters, its licensees range from individual radiographers to small medically related businesses to uranium mill operators to nuclear power plant owners. There are literally thousands of licensees, and new applications or amendments to existing licenses abound each year. We are unwilling to ascribe to Congress an intention that the Commission treat each of these applicants or their opponents in an identical procedural manner in the different categories of cases. Our analysis of the City's constitutional objections *infra* makes clear that the widely varying interests, the diverse risks involved, and strong governmental interests justify less than a section 554 trial-type hearing under the Due Process

²⁶As one court has said:

In approaching the problem of statutory interpretation before us, we show "great deference to the interpretation given the statute by the officers of agency charged with its administration. 'To sustain the Commission's interpretation of [a] statutory term, we need not find that its construction is the only reasonable one or even that it is the result we would have reached had the question arisen in the first instance in judicial proceedings.'"

We think such deference to the agency's interpretation of its governing statute is reinforced where . . . the legislative history is silent, or at best unhelpful, with respect to the point in question In such a situation [where Congress could not anticipate new technological developments that would arise for decades to come], the expert agency entrusted with administration of a dynamic industry is entitled to latitude in coping with new developments in that industry.

Philadelphia Television Broadcasting Co. v. FCC, 359 F.2d 282, 283-284 (D.C. Cir. 1966) (footnote omitted). See also note 12 *supra*.

Clause. We believe that the hearing requirement of section 189a similarly should not be interpreted to hamstring the Commission into providing a section 554 hearing in every licensing case. See *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc.*, 435 U.S. 519 (1978).

Our interpretation of section 189a is also supported by recent regulatory developments in administrative law jurisprudence. For many years, agencies and courts often overlooked the common sense use in adjudications of less than the trial-type procedures set forth in section 554. K. Davis, *Administrative Law Text* §4.07, at 106-07 (3d ed. 1972). In the 1970's, however, there was broad recognition of the principle that an agency can comply with a statutorily mandated hearing by something less than section 554 procedures as long as the adopted procedures are fair. In two seminal cases, *United States v. Allegheny-Ludlum Steel Corp.*, 406 U.S. 742 (1972), and *United States v. Florida East Coast Railway Co.*, 410 U.S. 224 (1973), the Supreme Court ruled that the requirement of a hearing in an agency's organic statute did not mandate a formal hearing in the absence of the phrase "on the record" or some definite congressional intention expressed in the statute's legislative history. Although both these cases involved rulemaking, as opposed to adjudication, courts have begun to realize that the rulemaking/adjudication dichotomy is not dispositive in interpreting a statutory hearing requirement; rather, the touchstone is fairness in light of the dispute presented.

The emphasis, today, in the absence of a specific statutory directive as to the requisite form of hearing, is on the requirements of a particular case, not on formalistic interpretations of statutory words, and not on the equally formalistic and often circular distinction between adjudication and rulemaking.

RCA Global Communications, Inc. v. FCC, 559 F.2d 881, 886 (2d Cir. 1977). The rulemaking/adjudication dichotomy was recognized in *Siegel v. AEC*, 400 F.2d 778 (D.C. Cir. 1968), but we think that that case supports our conclusions here. In *Siegel* the court upheld the AEC's interpretation of the word "hearing" as applied to rulemaking proceedings. Although section 189a uses the word "hearing" only once in referring to an interested party's right to a "hearing" both in licensing proceedings and in rulemakings, the court agreed that the AEC could interpret that same word differently for the two different types of agency action. Recognizing that the AEC provided at that time section 554 hearings in reactor licensing cases, the court nonetheless concluded that only a "notice and comment" proceeding under section 553 of the APA satisfied the section 189a "hearing" requirement for rulemakings. In our view, there is an analogous logical basis — and we add, no statutory prohibition has been

found — for further delineating among different types of licensing actions in deciding what type of “hearing” is appropriate in any particular licensing matter.

Thus, we believe that the word “hearing” in section 189a can be interpreted as allowing an informal hearing in at least some licensing cases. Other agencies that are required by statutes to adjudicate matters in “hearings” have been permitted to utilize informal adjudicatory procedures. For example, in *Marine Space Enclosures, Inc. v. FMC*, 420 F.2d 577, 589-90 (D.C. Cir. 1969), the court, focusing on section 15 of the Shipping Act of 1916, stated that:

The requirement of a hearing [in section 15] in a proceeding before an administrative agency may be satisfied by something less time-consuming than courtroom drama. In some cases briefs and oral argument may suffice for disposition . . . In some cases, however, the public hearing may usefully approach the legislative rather than adjudicatory model.

The court noted that section 15 required a hearing prior to agency modification, disapproval, or cancellation of an agreement. *Id.* at 540. The *Marine Space Enclosures* opinion was recently cited with approval in *Sea-Land Service, Inc. v. FMC*, 653 F.2d 544, 551, n.20 (D.C. Cir. 1981), in which the court stated:

The hearing contemplated by this section is not the full administrative hearing on the record that is required by the Administrative Procedure Act Rather, the “notice and hearing” requirement in section 15 contemplates “meaningful public participation”

Id. at 551 (footnotes omitted). A similar result was reached in *United States v. Independent Bulk Transport, Inc.*, 480 F.Supp. 474 (S.D.N.Y. 1979). The organic statute was the Federal Water Pollution Control Act Amendments of 1972, which required an “opportunity for a hearing” before assessment of a penalty. A survey of the appropriate legislative history did not conclusively indicate whether Congress intended the requirements of section 554 of the APA to apply to proceedings under 33 U.S.C. §1321(b)(6). The court stated:

The courts have never gone so far as to rule that all statutory hearings must be conducted in accordance with the APA despite the lack of a provision that they be “on the record” The mere fact that the penalty assessed by the Coast Guard was an adjudication required by statute to be made after a hearing did not mandate application of the APA.

Id. at 478-479. And in *Nofelco Realty Corp. v. United States*, 521 F.Supp. 458 (S.D.N.Y. 1981), the court ruled that another statutory

mandate in the Federal Water Pollution Control Act Amendments of 1972 for the issuance of dredge or fill permits "after notice and opportunity for public hearings," 33 U.S.C. §1344, did not require the Army Corps of Engineers to grant a section 554 hearing before denying an application to construct a bulkhead on a shoreline.²⁷

The application of these precedents is particularly appropriate here since the City has not shown there is a basis for concluding there were disputed adjudicative facts that had to be determined before the license amendment was issued. As is discussed more fully *infra*, a number of the City's issues present legal or policy disputes. Nonetheless, even if a statute normally does require a section 554 adjudication, a hearing need not be commenced simply to resolve such legal or policy issues. *See, e.g., Independent Bankers Association v. Board of Governors*, 516 F.2d 1206, 1220 (D.C. Cir. 1975). *A fortiori*, nothing more should be required under section 189a than allowing the City to argue its case in written submissions, and to respond to the licensee's arguments, a procedure which we have already followed. As to the adjudicative facts which the City has contested, our discussion of the City's claim makes clear that the City has provided no basis to support its conclusions that citizens and the environment will be exposed to airborne and waterborne radiological material in excess of NRC regulatory limitations.²⁸ In response to the City's bald assertions, the licensee provided monitoring and other data that show the use of fine water mist sprays and/or standard "fire-fighting" type foam has contained potential offsite

²⁷ To be sure, there are numerous cases interpreting a statutory requirement of a "hearing" or a "public hearing" to mean that a section 554 hearing must be held. In some of these cases, the legislative history of the relevant agency statute provided some reasonable support for that proposition. *See, e.g., Independent Bankers Ass'n v. Bd. of Governors*, 516 F.2d 1206, 1217-19 (D.C. Cir. 1975). However, as we have stated here, not only did Congress fail to focus on the need for formality in section 189a hearings, but its almost exclusive concern when it adopted the hearing requirement was for facilities licenses as opposed to materials licenses. In other of the cases requiring a section 554 hearing the courts made a presumption that we are unwilling to accept — *i.e.*, licensing adjudications by their very nature require trial-type procedures as contrasted with rulemakings, in which "notice and comment" is adequate. *See, e.g., Seacoast Anti-Pollution League v. Costle*, 572 F.2d 872 (1st Cir.), *cert. denied*, 439 U.S. 824 (1978); *Marathon Oil Co. v. EPA*, 564 F.2d 1253 (9th Cir. 1977). However, this view fails to recognize the modern trend towards fairness and away from classifying agency action as either rulemaking or adjudication. We agree with the observation of the United States Court of Appeals for the District of Columbia Circuit, expressed in connection with section 15 of the Shipping Act, that APA trial-type procedures "do not apply unless Congress has clearly indicated that the 'hearing' required by statute must be a trial-type hearing on the record." *United States Lines, Inc. v. FMC*, 584 F.2d 519, 536 (D.C. Cir. 1978) (emphasis added).

²⁸ As is explained more fully *infra*, the City did not even make any factual assertions, let alone provide any basis for believing, that by permitting Kerr-McGee to receive onsite for temporary storage very low-level radioactive material from 75 "hot spots" in West Chicago, the NRC has created any risk to public health and safety, or to the environment.

releases of radioactive material into the air or water. The City replied to the licensee's facts not by contesting them, but rather by arguing that the licensee had no legal authority to dismantle the buildings in this manner. Once again, even if section 189a requires a trial-type hearing, the City must make some threshold showing that a hearing would be necessary to resolve opposing and supported factual assertions. Having failed to do so, the City is not entitled to a formal hearing.²⁹

CONSTITUTIONAL DUE PROCESS DOES NOT REQUIRE A FORMAL, TRIAL-TYPE HEARING

Although section 189a's provision for a "hearing" does not require that a formal adjudicatory hearing under section 554 be convened, there nonetheless remains the question of what, if any, process is due the City under the Constitution. It is well established that due process "is not a technical conception with a fixed content unrelated to time, place and circumstances." *Mathews v. Eldridge*, 424 U.S. 319, 334 (1976) (quoting *Cafeteria & Restaurant Workers Union v. McElroy*, 367 U.S. 886, 895 (1961)). Rather, due process "is flexible and calls for such procedural protections as the particular situation demands." *Id.* (quoting *Morrissey v. Brewer*, 408 U.S. 471, 481 (1972)). In analyzing whether a given administrative procedure conforms to the requirements of due process, the Supreme Court has recognized that three distinct factors must be analyzed and balanced:

[F]irst, the private interest that will be affected by the official action; second, the risk of an erroneous deprivation of such interest through the procedures used, and the probable value, if any, of additional or substitute procedural safeguards; and finally, the Government's interest, including the function involved and the

²⁹ As we have said, the City's factual assertions were not only unsupported, but they were affirmatively rebutted by factual submissions from Kerr-McGee with which the City took legal, rather than factual, dispute. Courts have ruled that even where a statutory hearing requirement must be satisfied by a section 554 hearing, the party requesting the hearing "does not become entitled to an evidentiary hearing merely on request, or on a bald or conclusory allegation that such a dispute exists [An agency] is not to be burdened with a hearing requirement where a protestant has not given reason to believe a hearing would be worthwhile." *Connecticut Bankers Ass'n v. Bd. of Governors*, 627 F.2d 245, 251 (D.C. Cir. 1980). See also *Costle v. Pacific Legal Foundation*, 445 U.S. 198 (1980).

The City claims that its submissions meet the standard for admissible contentions under 10 CFR §2.714(b). However, that rule is applicable only *after* the Commission has triggered the hearing process by publishing a notice of the sort referenced in 10 CFR §2.700. Such notice was not published here. In any event, we do not believe that the City's contentions satisfy section 2.714(b).

fiscal and administrative burdens that the additional or substitute procedural requirement would entail.

Id. at 335.

Turning initially to a consideration of the private interest involved and how it will be affected in this instance, it has been recognized that the determination of whether an interest exists will depend not on the unilateral expectation of the one claiming the private interest, but rather on whether there is "a legitimate claim of entitlement to it." *Board of Regents v. Roth*, 408 U.S. 564, 577 (1972). A property interest, cognizable for due process purposes can be created by a congressional enactment, *Goldberg v. Kelly*, 397 U.S. 254, 262-63 (1970); *Pence v. Kleppe*, 529 F.2d 135, 140-42 (9th Cir. 1976), or agency regulations, see, e.g., *Joy v. Daniels*, 479 F.2d 1236, 1240-41 (4th Cir. 1973). It should be noted, however, that the generalized health, safety, and environmental concerns the City indicates it seeks to protect in any hearing may not be liberty or property interests subject to due process protection. See *Izaak Walton League of America v. Marsh*, 655 F.2d 346, 361 (D.C. Cir. 1981); *Gasper v. Louisiana Stadium & Exposition District*, 418 F. Supp. 716, 720-21 (D.La. 1976), *aff'd*, 577 F.2d 897 (5th Cir. 1978), *cert. denied*, 439 U.S. 1073 (1979). The only conceivable property or liberty interest here may be the City's statutory right under section 189a to some sort of hearing. See *Carolina Environmental Study Group v. United States*, 510 F.2d 796, 801 (D.C. Cir. 1975); *Union of Concerned Scientists v. AEC*, 499 F.2d 1069, 1081 (D.C. Cir. 1974). Although we doubt that this right to a hearing qualifies, we continue with our analysis.

Assuming the existence of a protectable interest does not end the inquiry, however, because the effect of the official action in question upon the private interest must be assessed. As to any statutory interest in a hearing, the City is not being deprived of a hearing; its argument is with the type of hearing.³⁰ Yet, even if we assume the existence of some other property or liberty interest in the health, safety, or environment of the

³⁰ Our due process analysis, insofar as we can assume that the section 189a hearing right is a protected interest, is in some sense not necessary. The question is whether the City is being deprived of that interest—i.e., its interest in having a hearing—without due process. However, if we were to find that the Constitution required certain hearing procedures, we would likely interpret section 189a as requiring those same procedures. See, e.g., *Califano v. Yamasaki*, 442 U.S. 682, 693 (1979) (absent explicit statutory language to the contrary, congressional solicitude for fair procedure will be assumed). Thus, we would conclude not that the City's due process rights were implicated, but rather that its Atomic Energy Act rights required a hearing. For this reason, the remainder of our due process analysis, which speaks of balancing risks and interests, can be considered relevant to two distinct, but related, matters: (1) assuming the existence of some property or liberty interest other than the right to a section 189a hearing (e.g., health, safety or environmental interests rising to the level of property or liberty interests), does due process require a section 554 hearing; and (2) balancing the various interests at stake, are there constitutionally-based reasons to interpret section 189a as requiring a section 554 hearing?

community, the Supreme Court has recognized that "the due process provision of the Fifth Amendment does not apply to the indirect adverse effects of governmental action." *O'Bannon v. Town Court Nursing Center*, 447 U.S. 773, 789 (1980); see *Martinez v. California*, 444 U.S. 277, 281 (1980). The effects of the governmental action of granting a license amendment to Kerr-McGee are indirect as to the City, thereby lending little weight to any assertion that due process requires that a formal proceeding be convened to protect the City's interests. Moreover, even if these indirect effects are considered, they do not appear to be compelling in this case. The importance of the City's supposed health, safety, and environmental concerns that are to be raised at any formal hearing is diminished by the City's failure to object to, and indeed its approval of, an almost identical demolition effort under Amendment No. 1.³¹ Further, as to the City's concerns about the effect of Amendment No. 3 as a precedent for additional Kerr-McGee activities prior to any final decommissioning plan, it is apparent that the demolition is required in any event and that it does not in any way alter or preclude any of the options now open for such a plan or prejudice any City concerns with regard to the ultimate disposition of the wastes at the Rare Earth facility. As to the offsite thorium, even if a later determination was made that it should not be placed at the Kerr-McGee site, it could be collected and removed to a different site, thereby mitigating any prejudice the City might perceive in the receipt of such wastes at the Rare Earth facility. Thus, the licensing action here has only indirect and insubstantial effects upon the City's concerns and interests in this instance, meriting less concern about formal trial-type procedures to protect those interests.

Considering next the risk of erroneous deprivation that might result from the procedures used, it is first worth reiterating the opportunity afforded both Kerr-McGee and the City to present their views and any information relevant to Amendment No. 3. Subsequent to its receipt of the City's petitions, the Commission wrote both to the City and Kerr-McGee requesting that the former provide any information or arguments it had relating to the health, safety or environmental effects of Amendment No. 3 and affording the latter an opportunity to respond. In response, the City sent a list of contentions, four of which presented only legal, nonfactual

³¹ See Exhibit C to Verified Response of Defendant Kerr-McGee Chemical Corp. to Temporary Restraining Order, No. 81 C 5743 (N.D. Ill. filed Oct. 15, 1981) (transcript of May 20, 1981 television news report in which Mayor of West Chicago indicated support of building demolition begun under Amendment No. 1). While it is correct that the demolition authorized under Amendment No. 1 was for a fewer number of buildings which, unlike those involved in Amendment No. 3, were in danger of collapse, nonetheless any purported inadequacy of the Kerr-McGee procedures existed under that first amendment as well.

questions and two of which were arguably factual.³² Kerr-McGee responded to the contentions by denying the validity of any of them. The Commission then addressed another letter to both Kerr-McGee and the City that asked the former to respond to the City's factual allegations concerning the dust abatement program and the lack of a lagoon and offered the City an opportunity to respond. As a result, Kerr-McGee submitted a detailed rebuttal of the City's contentions with supporting documentary information. The City responded by reiterating its earlier assertions, but provided no factual information, documentary or otherwise.

In requesting a formal hearing, the City has indicated its belief that additional procedures beyond the opportunity to provide written comments and documentation afforded here are necessary to fully adjudicate the validity of its concerns. In assessing the risk of erroneous deprivation of the City's interests, "the issue-specific and flexible analysis employed by the [Supreme] Court confirms that every due process case should be carefully examined in light of the factual determination to be made, the evidentiary factors that must be reviewed, the characteristics of the parties, and the role played by the decisionmaker." *Keller v. Joy*, 641 F.2d 1044, 1053 (2d Cir.) (Tenney, J., concurring), *cert. denied*, 102 S. Ct. 390 (1981).

Looking to those factors in this instance, we note that while the factual determination to be made is one involving public health and safety and environmental considerations, nonetheless the evidentiary review is one that is based in large part on technical submissions containing objective data and scientific judgments. The determination of factual issues whose resolution lies in technical or scientific submissions usually does not require an oral, trial-type presentation. See *Mathews v. Eldridge*, *supra*, 424 U.S. at 344-45 (information crucial to decision on entitlement of Social Security disability benefits usually derived from medical reports, such as clinical or laboratory tests and x-rays, which are more amendable to written rather than oral presentation); *Basciano v. Herkimer*, 605 F.2d 605, 611 (2d Cir. 1978) (in making decision on eligibility for accident disability retirement benefits, evidence relevant to medical determination can be presented as effectively in writing as orally), *cert. denied*, 442 U.S. 929 (1979); *Graham v. National Transportation Safety Board*, 530 F.2d 317, 320 (8th Cir. 1976) (determination of fitness for exemption from regulation precluding granting of airman's certificate for history of alcoholism based on medical reports; no further right to be heard need be given); *NAACP v. Wilmington Medical Center, Inc.*, 453 F. Supp. 330, 343 (D. Del. 1978) (decision

³² Of the six contentions listed at p. 242 *supra*, only those regarding the inadequate use of water for a fogging system and the failure of Kerr-McGee to construct a lagoon can be considered as presenting factual issues. A detailed discussion of our resolution of the legal and factual issues presented by the City follows beginning at page 262 *infra*.

on potential effect upon urban minorities of relocation of hospital and the appropriate remedy for such effect likely to be based largely on technical information that does not necessitate on oral evidentiary hearing); *Owens v. Hills*, 450 F. Supp. 218, 223 (N.D. Ill. 1978) (objective factual determination of whether structural defect exists in dwelling requires only written submission of materials relative to structural defect without oral hearing). Further, while the City contested whether the Kerr-McGee dust control and water runoff measures were adequate, when Kerr-McGee responded with data to show why its dust abatement procedures were proper and why no lagoon was needed, the City did not contest the accuracy of Kerr-McGee's submissions. When questions of credibility or veracity are not raised, a decision based on written submissions rather than on oral, trial-type presentation does not offend due process. See *Califano v. Yamaski*, 442 U.S. 682, 696 (1979) (review of written submissions sufficient for initial decision to recoup Social Security overpayments when issues of credibility or fault not likely to be involved); *Mathews v. Eldridge, supra*, 424 U.S. at 343-44 (initial decision to discontinued Social Security disability benefits likely to turn on written medical reports rather than issues of credibility so that no oral presentation required); *Digital Equipment Corp. v. Parker*, 487 F. Supp. 1104, 1112 (D. Mass. 1980) (no need for oral hearing if demeanor evidence not essential), *vacated on other grounds*, 653 F.2d 701 (1st Cir. 1981). Further written submissions are appropriate when, as here, the parties' private interest is fully represented by counsel. See *CNA Financial Corp. v. Donovan*, Civ. No. 77-0808, slip op. at 9 (D.D.C. Oct. 29, 1981). In addition, to the extent that no controverted issue of material fact is presented or that the questions presented are purely legal, the parties need only be afforded an opportunity to make written submissions. See *Monumental Health Plan, Inc. v. HHS*, 510 F. Supp. 244, 249 (D. Md. 1981). A careful reading of the submissions of Kerr-McGee and the City make it evident that, as is indicated in more detail *infra*, there are no controverted factual issues involved here, but rather a disagreement over the legal significance of certain facts or over whether certain agency actions are legally mandated. Finally, as a general proposition the risks associated with materials licenses are frequently of lesser magnitude than those associated with reactor licenses. This is surely the case as to the Kerr-McGee amendment.

Taking into account the technical, scientific nature of the factual issues involved, the absence of any credibility questions with regard to the parties' submissions, the fact that the City's interests were represented before the agency by experienced counsel, and the lack of any material issues of fact with regard to the City's contentions that raised factual issues, the procedures for written submissions and comment used were

sufficient to fully apprise the agency of the grounds for the City's concern and to provide an adequate record for determining the validity of its assertions. Moreover, Kerr-McGee's proposed amendment has received extensive staff analysis and scrutiny, with the conclusion being that adverse health, safety, and environmental impacts were so *de minimis* or non-existent so as to preclude even the necessity for a negative environmental declaration. Thus, not only do we believe that the risk of an erroneous decision based upon the written procedures used was minimal and acceptable, but the real impact of any such error on public health, safety, or environmental concerns similarly appears to have little practical meaning.³³

The final factor to be considered is the government's interest in being allowed to evaluate requested materials licensing actions in an informal hearing on the basis of written submissions and comments by interested persons. Of concern in this regard are the administrative burden and other societal costs associated with requiring, as a matter of constitutional right, an oral evidentiary hearing upon demand in all materials licensing cases. See *Mathews v. Eldridge*, *supra*, 424 U.S. at 347. In each instance that a formal hearing is convened, the expense for the agency, and indeed for all the parties involved, is multiplied several-fold. A three-member licensing board or administrative law judge must be appointed, and with that come all the accouterments that make the proceeding more costly in terms of the time and materials expended: e.g., participation in a prehearing conference, preparation of transcripts, discovery, submission of prefiled testimony, a trial-type hearing at which witnesses are presented and cross-examined, and the preparation of findings of fact and conclusions of law. The extra cost and delay involved in each formal, trial-type adjudication can become a special problem in the materials licensing area because, in any given year, the NRC receives literally thousands of applications for materials licenses or license amendments.³⁴ If, in even a small percentage of these licensing actions, a hearing was requested and a formal hearing was convened, agency resources would soon be stretched to the limit.³⁵ Not only would this affect the ability of interested persons to obtain a prompt

³³ In *Mathews v. Eldridge*, 424 U.S. 319, 344 (1976), the Supreme Court noted that "due process rules are shaped by the risk of error inherent in the truth finding process as applied to the generality of cases, not the rare exceptions." Although a variety of nuclear materials and materials usage activities and facilities are subject to NRC's jurisdiction, the requests for licensing action embodied in Amendment No. 3 are not necessarily atypical, when compared to other materials licensing actions, in terms of the nature of the factual or legal issues involved and the risks of health, safety, or environmental harm.

³⁴ The 1980 NRC Annual Report indicates that currently the agency administers some 8,700 material licenses and took approximately 4,614 licensing actions concerning these permits in fiscal 1980. United States Nuclear Regulatory Commission, *1980 Annual Report* 110 (March 1981).

³⁵ See note 12 *supra*.

resolution of their materials license hearing requests, but it could ultimately jeopardize the NRC's ability to safeguard the public health and safety if extensive resources had to be directed to the legal hearing process at the expense of health and safety review of power reactors and other facilities which generally raise broader concerns. Accordingly, the possibility of greatly increased costs and, indeed, the potential for interference with the agency's responsibilities for protection of the public health and safety and the environment, indicate clearly an important governmental interest in being able to conduct informal hearings on the basis of written submissions in materials licensing cases.

Under the Supreme Court's suggested due process analysis, we think the procedures used in this instance afforded all the participants the due process that was necessary.³⁶ Although the City's asserted interest in the safety and health of its citizens and in the environment of the West Chicago area is an important one, the opportunity for it to present its objections and any information in support of its objections and to comment on Kerr-McGee's submissions was adequate under the circumstances. The factual issues involved are of a technical nature whose resolution does not require any oral, trial-type inquiry focusing on credibility and, accordingly, additional procedures are unlikely to add to the fact-finding process or result in a better record for agency review. The need for additional procedures being highly questionable, the magnitude of the increased government burden that would be involved by requiring additional procedures becomes of "pivotal importance." *Gerritson v. Vance*, 488 F. Supp. 267, 270 (D. Mass. 1980). As was indicated, that increased burden could be considerable in the materials licensing area. Accordingly, the procedure here comported with the requirements of due process, as well as those of the Atomic Energy Act and agency regulations.

THE CONTENTIONS OF THE CITY OF WEST CHICAGO ARE WITHOUT MERIT

Having established that the solicitation of written comments was sufficient here to satisfy any requirement for a "hearing" under the Atomic Energy Act and the Due Process Clause, and that our regulations provide no greater right, we turn finally to consider the merits of the six contentions put forth by the City in the context of this "informal" hearing.

³⁶ Although instances might arise in which the Commission, in the exercise of its discretion, could afford an interested person a formal hearing after a materials licensing action is taken, it seems apparent from West Chicago's filings in this instance that it has no interest in such a post-amendment proceeding.

1. No Environmental Impact Statement Was Required Prior to Issuance of Amendment No. 3.

Under NRC regulations, an environmental impact statement (EIS) or a negative declaration that an environmental impact statement will not be prepared, with an environmental impact appraisal supporting that determination, need not be prepared if a license amendment is considered by the agency to be nonsubstantive or insignificant from the standpoint of environmental impact. 10 CFR §51.5(d)(4). In this instance, the staff made such a finding based on its review of Kerr-McGee's demolition activities under Amendment No. 1 and the circumstances surrounding the offsite thorium material. As to the former, staff review of Kerr-McGee's health physics plan, its project management and employee training, the procedures used in demolition of Building No. 3 under Amendment No. 1, and the lack of any detectable environmental impacts during the use of those procedures in terms of airborne particles and water runoff resulted in the conclusion that any offsite impacts that would result from demolition of the additional buildings would be insignificant. Likewise, the staff's analysis of the receipt of the offsite thorium materials revealed no significant environmental impacts that could reasonably be expected. The licensing staff had previously determined that the radioactive materials offsite were not sufficient for the agency to assert licensing authority as to each individual owning land in which the materials were found. Moreover, the staff determined that the State of Illinois' plans for removal of the materials could be put into effect without environmental impact if simple and well-known procedures were used. The staff found that the State had expert personnel who could manage the project and ensure that the proper actions were taken. In addition the staff noted that the volume of material involved—in fact, less than a fraction of one percent of the material already onsite—as well as its radioactive content would be minor. No impact on the problem of decommissioning the site was thus expected by the addition of the offsite materials.

All these staff findings are supported by the record before us. Moreover, the City has not supplied, or indicated that it has, any information that would cast doubt upon the staff's findings or its conclusion that the impact of Amendment No. 3 would be so insignificant as not to require an environmental impact statement or a negative declaration. Instead, the City merely asserts that the failure of the staff to prepare an environmental impact statement constitutes "illegal segmentation" of the as yet unapproved Kerr-McGee decommissioning and disposal plan for the site in violation of the National Environmental Policy Act (NEPA).

Although an agency cannot skirt NEPA's requirements that an EIS be prepared prior to a major federal action involving significant environmental

impacts by seeking to segment an overall plan into numerous parts, each of which has little environmental effect, such a concern is not implicated here. Instead, the only real question is whether, prior to completing a comprehensive EIS on the stabilization plan, the NRC can allow Kerr-McGee to undertake a portion of that plan after agency consideration of whether the environmental impacts of that portion require that an EIS be prepared for that part. In *Kleppe v. Sierra Club*, 427 U.S. 390 (1976), the Supreme Court indicated that the answer to that question is yes. In *Kleppe*, the legal challenge was to the failure of the Interior Department to prepare a comprehensive, regional EIS prior to allowing individual actions for the development of coal reserves in the Northern Great Plains. In the course of its discussion about what considerations controlled whether a comprehensive EIS was required, the court noted:

Even had the Court of Appeals determined that a regional impact statement was due at that moment, it still would have erred in enjoining approval of the four mining plans unless it had made a finding that the impact statement covering them inadequately analyzed the environmental impacts of, and the alternatives to, their approval. So long as the statement covering them was adequate, there would have been no reason to enjoin their approval pending preparation of a broader regional statement; that broader statement, when prepared, simply would have taken into consideration the regional environmental effects of the four mining plans once they were in operation, in determining the permissibility of further coal-related operations in the region.

427 U.S. at 407 n.16. In other words, so long as the environmental treatment of the individual project under NEPA was adequate, it did not matter if the comprehensive statement was still in preparation. The court further explained the reason for this conclusion as follows:

Nor is it necessary that petitioners always complete a comprehensive impact statement on all proposed actions in an appropriate region before approving any of the projects. As petitioners have emphasized, and respondents have not disputed, approval of one lease or mining plan does not commit the Secretary to approval of any others; nor, apparently, do single approvals by the other petitioners commit them to subsequent approvals. Thus, an agency could approve one pending project that is fully covered by an impact statement, then take into consideration the environmental effects of that existing project when preparing the comprehensive statement on the cumulative impact of the remaining proposals.

Id. at 414 n.26.

Certainly, the staff's determination in this instance was a sound one, fully in accord with *Kleppe*. A comprehensive draft EIS is being prepared regarding the stabilization of wastes at the West Chicago facility. That draft is scheduled for release in Spring 1982 and will discuss Kerr-McGee's plan for final disposal on the site, as well as suggested alternatives for the disposal of the thorium material involved. There is an obvious relationship between the demolition of the buildings and the final disposal of the waste, including that from the buildings dismantled, at the West Chicago facility. Nonetheless the activities and the environmental concerns involved are sufficiently distinct such that consideration of the demolition procedures need not await the preparation of a comprehensive impact statement on the ultimate disposal of the onsite wastes. Moreover, under any of the reasonable options for disposal, the buildings onsite are to be demolished so that demolition does not enhance or preclude any of those options. Likewise, receipt of the offsite materials, which was never part of Kerr-McGee's proposed stabilization plan that is the focus of the draft EIS in preparation, has been determined to be minor in volume and radioactive content. It is, therefore, not capable of adding in any significant way to the concerns that already exist with regard to decommissioning or of foreclosing any of the ultimate disposal options being considered. Finally, to the extent the insignificant environmental effects involved in Amendment No. 3 have bearing on the overall environmental impact of the comprehensive plan for stabilization, those can still be considered in the comprehensive EIS now in preparation. Clearly, in this instance, after consideration of the environmental impacts of the actions proposed in Amendment No. 3, the Staff properly could issue the amendment without waiting for completion of the draft EIS now in preparation. *Kleppe v. Sierra Club, supra*; see *Peshlakai v. Duncan*, 476 F. Supp. 1247, 1260 (D.D.C. 1979); *Conservation Law Foundation v. GSA*, 427 F. Supp. 1369, 1374 (D.R.I. 1977).

We find that under 10 CFR §51.5(d)(4), no EIS or negative declaration was required covering the demolition of additional buildings or the receipt of offsite thorium as allowed by Amendment No. 3.³⁷ The staff also acted properly in granting the amendment without awaiting completion of the draft EIS being prepared. An evidentiary hearing under the APA was not required by law to reach these conclusions.

³⁷ The Commission notes that, pursuant to 10 CFR §2.744, the City has requested copies of the EIS and draft EIS relating to the demolition of the buildings at the West Chicago site. As our discussion of the City's NEPA contention makes clear, there is no EIS or draft EIS relating to the building demolition.

2. Kerr-McGee is not using the water fog system it is required to use under its proposed decommissioning plan.

Asserting that municipal water use records show an inadequate consumption of water at the Kerr-McGee site, the City contends that Kerr-McGee has failed to use the water fogging system for dust control described in its proposed site stabilization plan which, in turn, may result in offsite contamination from airborne radioactive debris. In its response, Kerr-McGee has detailed the means it has used for dust control under Amendment No. 1. Included are attachments that outline the step-by-step procedures used for dismantling of Building No. 3. In light of the measures being taken, which include the use of fine water sprays in combination with "fire-fighting" type foam, Kerr-McGee's uncontroverted assertion that the need for extensive use of water has been alleviated is fully supported. Further, the air particle sample station records attached to the Kerr-McGee filing of December 4, 1981, indicate that between January 1981, prior to the start of demolition, and October 1981, when demolition had been ongoing for several months, there had been no detectable increase in airborne radioactivity. Kerr-McGee's factual submissions, buttressed as they are by staff's various inspection tours to review the ongoing demolition, are not controverted by any information introduced by the City and establish that the procedures being used do not endanger the public health and safety or the environment. The City has not provided us with a basis for commencing a trial-type APA hearing on this question even it we believed, which we do not, that there is a legal right to such a hearing when it is necessary to resolve factual disputes.

The City also appears to raise the somewhat narrower question of whether, by its terms, Amendment No. 3 grants Kerr-McGee authority to use a demolition procedure involving both water and foam because such a procedure is not specifically mentioned in the proposed decommissioning plan. Amendment Nos. 1 and 3 and the documents referenced therein, including the proposed decommissioning plan and the health physics plan, do not speak of foam. Indeed, only water, the traditional abatement agent, is mentioned in the stabilization plan proposed by Kerr-McGee. See p. 4 *supra*. Nonetheless, it is apparent that the thrust of the applicable provisions of the stabilization plan and the health physics plan is dust abatement, rather than dust abatement by the use of water.³⁸ As a result of

³⁸ Our view is also supported by Kerr-McGee's letter to the NRC on May 3, 1981, in which the licensee stated its intention to deal with nonradioactive contaminants in the buildings through means which clearly indicate that not only water will be used. That letter said that "all material remains wet during storage and handling 'Adequately wetted' means sufficiently mixed or coated with water or an aqueous solution to prevent dust emission." (Emphasis added.) Likewise, by its terms the health physics plan indicates that a number of measures were to be used to avoid spreading airborne radioactive particles during clean-up operations, including painting, vacuuming, and wet scrubbing.

innovations developed and tested during actual demolition³⁹ — innovation of which the NRC staff was fully aware and had reviewed⁴⁰ — a modified system using both water and foam was found by Kerr-McGee to be satisfactory for dust abatement. Certainly such an innovation was not inconsistent with the terms of the proposed stabilization plan or the health physics plan, both of which sought to ensure an effective dust abatement system. Further, Kerr-McGee's August 1981 application for authority to dismantle additional buildings indicated it would be done in the same manner, *i.e.*, using the water/foam procedure, as was being used at that time. The staff's September 1981 approval of that request, which again referenced the stabilization plan, was granted on the basis of staff's review of ongoing procedures, including the use of the modified dust abatement system. Just as the use of a modified water/foam procedure is not inconsistent with the proposed stabilization plan's provision concerning dust abatement, so the absence of specific mention of that procedure in the amendment itself does not place those procedures outside the scope of the activities authorized by the amendment. This issue also does not require resolution in a trial-type hearing, even if such a hearing were legally required in other circumstances.

Finally, the City complains of the lack of an opportunity to comment on the Kerr-McGee demolition procedures. While the City might prefer a bolt-by-bolt description of the dismantling procedure for the purposes of considering whether it will grant a demolition permit in instances like that involving Kerr-McGee, the information provided by the proposed stabilization plan and the other publicly available documents relating to the amendment here were sufficient to inform the public of the contours of the proposed amendment so as to allow for any comment or challenge. Moreover, in its December 4 submission to the Commission, Kerr-McGee detailed the procedures it has used previously and indicated that it will be

³⁹ That the proposed decommissioning procedures were subject to further development was indicated early on by Kerr-McGee. In its March 1980 letter seeking authority to demolish Building No. 1, Kerr-McGee noted that NRC approval for dismantling would allow it an opportunity to evaluate its procedures by actual use.

⁴⁰ As an example, Kerr-McGee's attachment to its December 4, 1981 letter, which details the NRC's West Chicago site visits between January and November 1981, indicates that on August 27, 1981, personnel from the NRC office in Region III reviewed the work in progress, including the Control Work Packages detailing the work to be done, and looked at slides of foam being used during demolition. Moreover, as is detailed in an NRC letter and report dated September 1, 1981, during the course of the many NRC visits, the work onsite was reviewed, as were the air sample measurements of Kerr-McGee's perimeter samplers. In addition, NRC personnel took their own air samples to check on dust abatement.

using the same procedures in dismantling the additional buildings. The City was afforded an opportunity to question the adequacy of any of those procedures by means of its December 11, 1981 filing and did not do so. Thus, there is no merit to this assertion,⁴¹ nor was an evidentiary hearing necessary to resolve this legal claim.

3. Kerr-McGee failed to build a lagoon to capture runoff water from dust abatement procedures as the proposed decommissioning plan requires.

Besides contesting the adequacy of the Kerr-McGee dust abatement procedures, the City also challenges Kerr-McGee's action in not building a lagoon to contain the water from its demolition activities, despite the fact such a lagoon was proposed in its stabilization plan, on the ground that without a lagoon water runoff "may" threaten health, safety, and the environment. Instead, Kerr-McGee's present system uses existing floor trenches to funnel the water to available storage tanks. After considering the Kerr-McGee submissions describing this system, it appears that the less extensive measures involved are consistent with its use of fine water sprays and foam for dust abatement, which resulted in less water usage and less runoff. Further, as the water monitoring figures indicate, there seems to have been no detectable increase in radiation due to the dust abatement program. As proposed by Kerr-McGee and analyzed by the NRC staff, the procedures for collecting and containing water runoff appear to be effective and can be applied in the demolition of the additional buildings without compromising the public health and safety, or the environment. In view of the City's failure to support its bald assertions and to provide a basis for rejecting Kerr-McGee's factual assertions, there is no necessity for a trial-type hearing to resolve this matter.

In addition to its challenge to the merits of Kerr-McGee's chosen procedures, the City also questions whether Amendment No. 3 authorizes the use of those procedures. In its 1980 and 1981 letters regarding Amendment No. 1, however, Kerr-McGee indicated that it wished to implement an alternate system by utilizing existing floor trenches to funnel the water into available tanks. This was approved by reference by the NRC staff's letter of April 24, 1981, granting Amendment No. 1. Subse-

⁴¹ Although not explicitly set out in its November 12 filing, in its December 11 submission the City challenges the validity of the Kerr-McGee procedures because they related only to Amendment No. 1. We note, however, that the proven effectiveness of those procedures in the demolition of Building No. 3, see p. 266 *supra*, provides a strong case for their effectiveness with regard to the additional buildings, absent some showing of a substantial distinction between the building demolished and the buildings proposed to be demolished. Kerr-McGee has asserted there is no distinction of substance, a conclusion with which the NRC staff has agreed, and one which the City has not questioned.

quently, in its August 1981 request for a second demolition amendment Kerr-McGee indicated it wished to proceed with the demolition of the additional buildings in the same manner as was being presently done. This was agreed to by the NRC staff, referencing the earlier Kerr-McGee letters requesting permission to use existing trenches and available storage tanks. While we do not believe that reference to the earlier Kerr-McGee letters expressly proposing existing trenches and storage tanks was necessarily required to allow that method to be used, it is clear that the Kerr-McGee system for handling water runoff was contemplated by, and approved in, Amendment No. 3. This nonfactual issue has been resolved without the need for an evidentiary hearing.

4. Kerr-McGee's purported failure to obtain city building permits.

The City also asserts that Amendment No. 3 cannot be granted because Kerr-McGee has not obtained the necessary building demolition permits from the City. However, even assuming that the City can properly exercise such licensing authority over Kerr-McGee,⁴² the potential for an action by a state or local regulatory authority that will affect a facility seeking an NRC license normally is not sufficient reason for this agency to stay its licensing action pending the outcome of any proceeding to impose additional requirements. See *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), ALAB-189, 7 AEC 410, 412 (1972). Rather, it is the prerogative of the other governmental entity asserting jurisdiction to take whatever measures it deems appropriate to enforce its regulatory authority. See *Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant, Units 1 and 2), ALAB-443, 6 NRC 741, 748 (1977). We perceive no reason for the NRC to delay issuing the amendment or to take any other action solely on the basis of the City's bald assertions of regulatory authority. This broad legal claim can be resolved without the need for an evidentiary hearing.

5. Approval of Amendment No. 3 is inconsistent with the staff's proposed criteria for applications for disposal or onsite storage of residual thorium wastes.

The City asserts that the demolition of additional buildings under Amendment No. 3 and the incorporation of the wastes resulting therefrom with the materials already onsite is in violation of proposed staff criteria

⁴² We note that the City of West Chicago has already, although unsuccessfully, sought a judicial imprimatur of its regulatory authority over the Rare Earth facility. *City of West Chicago v. Kerr-McGee Chemical Corp.*, No. 80 C 3357 (N.D. Ill. Jan. 8, 1981) (memorandum opinion and order granting motion for summary judgment in favor of defendant Kerr-McGee).

concerning applications for disposal or onsite storage of residual thorium wastes. More particularly, the City charges that the demolition activities are inconsistent with proposed Option 5. As it now reads,⁴³ the proposed option states:

5. Storage of licensed concentration of thorium and uranium onsite pending the availability of an appropriate disposal site.

When concentrations exceed those specified in option 4, long term disposal other than at a licensed disposal site will not normally be a viable option under the provisions of 10 CFR 20.302. In such cases, the thorium and uranium may be permitted to be stored onsite under an NRC license until a suitable method of disposal is found. License conditions will require that radiation doses not exceed those specified in 10 CR Part 20 and be maintained as low as reasonably achievable.

Initially, we think it important to point out that the criteria involved here are contained in a branch technical position for implementing a specific regulation, 10 CFR §20.302, which is not involved in this case and which is subject to revision. 46 *Fed. Reg.* 52061 (Oct. 23, 1981). Nonetheless, Option 5 is not inconsistent with the demolition activities contemplated by Amendment No. 3.

Assuming that the City is correct that the concentrations at the Rare Earth facility qualify for consideration under Option 5, that option provides only that long term disposal other than at a licensed disposal site "will not normally be a viable option" and that the wastes may be stored onsite under NRC license "until a suitable method of disposal is found." 46 *Fed. Red.* at 52063. Whether long term disposal at the present West Chicago site "is a viable option" and exactly what is a "suitable method of disposal" in this instance are still in question; however, the demolition of the additional buildings at the Rare Earth facility clearly does not foreclose whatever may be the final decommissioning decision. This contention does not justify a trial-type hearing under the APA.

6. **The NRC's failure to require Kerr-McGee to follow the conditions of its proposed decommissioning plan sets a precedent for future Kerr-McGee failures to follow the plan.**

Throughout its pleadings, the City bemoans the fact that the NRC is not requiring Kerr-McGee to follow to the letter its proposed stabilization

⁴³ In its hearing petitions and its responses to the Commission's requests for information the City refers to an NRC paper dated July 22, 1981. The most recent version of the staff's proposed criteria was published on October 23, 1981, 46 *Fed. Reg.* 52061, and is referenced herein. Public comments on those criteria were to be submitted by December 22, 1981. Among the respondents was the City of West Chicago, which submitted a letter dated December 18, 1981, with attached comments.

plan. That plan, however, while the springboard for consideration of the proper methods for decommissioning and stabilization of the West Chicago site, is nonetheless a proposal. As such, it is subject to change by Kerr-McGee and does not bind the NRC prior to the agency's explicit approval of any portion thereof. Procedures proposed by Kerr-McGee may be modified or changed prior to final NRC approval in response to technological innovation, analytical refinements, or NRC requirements. Likewise, the schedule proposed in the plan is not one that necessarily must be followed to the extent that the action contemplated does not foreclose any reasonable option that exists for the disposal of the onsite thorium wastes. As it did in this instance, Kerr-McGee must seek approval of the NRC staff before undertaking any decommissioning actions; the staff, in turn, must consider whether allowing such activity is consistent with our rules that provide for protection of the public health and safety and the environment, whether it would preclude or prejudice any disposal option, or whether it would otherwise be inappropriate under the circumstances. We find the staff's actions in this regard were proper under these criteria. There is no merit to the City's contention.⁴⁴ Certainly no evidentiary hearing is needed to reach this conclusion.

CONCLUSION

As we have made abundantly clear in this order, the procedures afforded the parties in this instance are sufficient to fulfill the Commission's obligations under its regulations, section 189a of the Atomic Energy Act, and the Due Process Clause of the Constitution. Moreover, after careful consideration of the City's hearing petitions and the responses of the City and Kerr-McGee to the Commission's requests for information, as well as the pertinent documents from the NRC's public docket concerning the West Chicago facility, we find no basis for disturbing the determination of the staff that License Amendment No. 3 to Source Material License No. STA-583 should issue.

Commissioners Gilinsky and Bradford dissent from this order. Their separate views are attached. The additional views of Commissioner Ahearne are also attached.

⁴⁴ Kerr-McGee itself has recognized that its receipt of the small amount of offsite wastes from West Chicago that are to be gathered by the State of Illinois should not be viewed as a precedent for acceptance of additional low-level radioactive materials. In a September 25, 1981 letter to the Director of the Illinois Department of Nuclear Safety, Kerr-McGee President J. L. Rainey stated that while Kerr-McGee was willing to cooperate with the City and the State by accepting the material for storage, "Kerr-McGee has no intention or interest whatsoever in converting the West Chicago facility into a waste disposal site for any materials other than those presently on the site."

It is so ORDERED.

For the Commission,

SAMUEL J. CHILK
Secretary for the Commission

Dated at Washington, D.C.,
this 11th day of February, 1982

COMMISSIONER GILINSKY'S SEPARATE VIEWS

It would have been more efficient, and legally more prudent, for the Commission to have granted the City's hearing request and appointed an Administrative Law Judge to hear this case using informal procedures. It would be reasonable to expect the Administrative Law Judge to issue a decision within, at most, two months.

DISSENTING VIEWS OF COMMISSIONER BRADFORD

The issue in this case is not whether to approve of the petitioner's motives or past approach to the matter. Nor is it whether or not this particular amendment seems on its face to pose a significant threat to the public health or safety. It is whether to treat *all* materials licenses differently from power reactors. This question should be approached with the realization that a materials license could as easily be for a major reprocessing plant with large quantities of radioactivity, a fuel fabrication facility handling material that could be diverted for use in a nuclear bomb, or a facility for the storage or disposal of nuclear wastes.

This is the first nonmilitary materials license case in the 25 year history of section 189(a) in which the Commission has insisted on a nonadjudicatory hearing. Whenever an interested person sought a hearing on a materials license amendment, that person was directed to file a petition for intervention under 10 CFR 2.714 and was granted an opportunity for an adjudicatory hearing.¹ Except for the Erwin case to which the Commission

¹ See, e.g., *In the Matter of Walker Trucking Company*, 1 AEC 55 (1958); *Hamlin Testing Laboratories, Ind. v. U.S. Atomic Energy Commission*, 357 F2d 632, 638 (6th Cir. 1966). Kerr-McGee in its pleadings to the Commission assumed that if a hearing were held, to which it expressed no objection, the hearing would be an adjudicatory one before a Licensing Board.

has had to apply the APA's military function exemption in order to avoid an adjudicatory hearing, the Commission has found no case offering anything other than an adjudicatory hearing when a request for a hearing on a materials license was made.² In its brief filed in *Seigel v. AEC*, 400 F.2d 778 (D.C. Cir. 1978) the Commission states at page 15 that section 189(a) contemplates adjudicatory hearings on licensing cases.

The consistency of the Commission's interpretation of Section 189(a) reflects the position it took originally before Congress. In brief, the Commission stated that the 1957 amendment to section 189 of the Atomic Energy Act, which added a mandatory hearing requirement, required the hearing and decision to comply with the provisions of sections 5, 7 and 8 of the APA. This position was articulated, among other times, when Congress was considering some liberalization of the mandatory hearing requirement in 1961. A panel discussion among Professor Kenneth C. Davis, Professor David E. Cavers, Mr. Lee Hydeman and Dr. Theos J. Thompson was held at the conclusion of the hearings which preceded the enactment of the amendments (Radiation Safety and Regulation, Hearings before the Joint Committee on Atomic Energy, 87th Cong., 1st Sess., pp. 372-389). Professor Davis disagreed with the Commission's view that section 189 required a trial-type hearing and the exchange between Professor Davis and the Commission continued after the close of the hearings. AEC General Counsel Naiden, in a letter dated September 6, 1961 to Mr. Ramey, Executive Director of the Joint Committee on Atomic Energy, stated that "Section 189(a) of the Atomic Energy Act explicitly requires a hearing on the record conducted in accordance with the APA. For the Commission to have made any other interpretation would have been inconsistent with what we believe to have been the intent of Congress in adopting the mandatory hearing requirements." The Commission's interpretation of the mandatory hearing requirement was, in effect, ratified when Congress passed amendments in 1962. One of these amendments added Section 191 to the Act which authorized the Commission to establish one or more Atomic Safety and Licensing Boards . . . "notwithstanding the provisions of sections 7(a) and 8(a)" of the APA. Sections 7 and 8 of the APA apply only to adjudications required to be determined on the record after opportunity for an agency hearing subject to the provisions of section 5. Therefore, the exception to permit the use of Licensing Boards in lieu of hearing examiners would not have been necessary unless the trial-type procedures of section 5 were considered to apply. Since the adjudicatory

² For a discussion of the agency's consistent position that section 189(a) requires an adjudicatory hearing in materials license cases, see *In the Matter of Nuclear Fuel Services, Inc.* CLI-80-27, 11 NRC 799, 809 (1980), particularly notes 2 and 3. The documents cited there are available in the docket of that case.

provisions of the APA apply to NRC adjudications, the statutory authority to conduct a legislative hearing in an NRC adjudication would have to be found in the APA itself. The 1962 hearings were also significant because Congress, knowing the Commission's interpretation of its own statute, did not pass the legislation recommended by its consultants to relax the adjudicatory hearing requirement.

The Commission seeks to make a distinction, not found in the statute, between materials licenses and all other NRC licenses. That Section 189(a) requires an adjudicatory hearing for reactor licenses is not in dispute. One hopes that the Commission would require adjudicatory hearings for materials licenses such as reprocessing plants like Barnwell, UF₆ conversion facilities, fuel fabrication facilities and milling operations. Otherwise, the Commission would be ascribing to Congress an intent, not expressed, of applying lesser procedural safeguards to major nuclear facilities, some of which posed the same "novel technological questions with wide-ranging safety concerns," which the majority find applicable to reactors. Commission Opinion, p.32. However, if the Commission's reading of Section 189(a) is accepted, the NRC will have the discretion to deny full hearings for types of facilities at least as potentially dangerous in some circumstances as power reactors, a result that Congress cannot have intended.

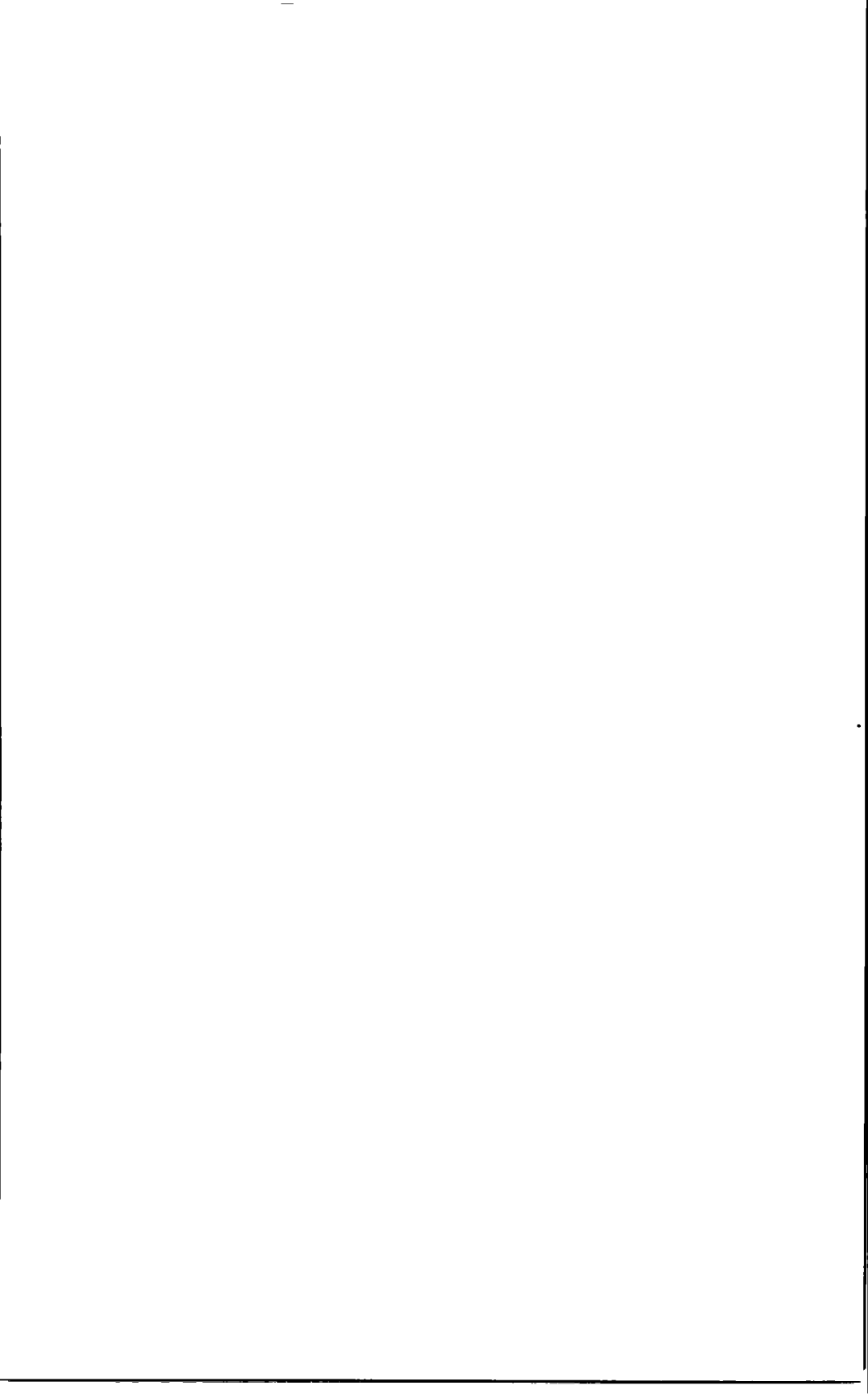
The precise words "on the record" need not appear in order to trigger the formal adjudicatory procedures of the APA.³ The general presumption is that unless a statute specifies otherwise, hearings involving disputed facts subject to judicial review on the basis of the hearing record must be on the record. 572 F.2d at 877; 564 F.2d at 1263, citing Attorney General's Manual on the APA at 41. Furthermore, NRC license amendment adjudications often involve disputed factual issues and subsection b. of Section 189 of the AEA provides for judicial review of final orders entered in the proceedings specified in subsection a. on the basis of the hearing record.

The plain language of Section 189(a), its legislative history, case law and the agency's consistent historic interpretation conclusively demonstrate that the agency must, when requested, hold an adjudicatory hearing in materials licensing cases. If the petitioners lack legitimate contentions, the hearing will be a short one, lasting at most until the summary judgment stage. In this case, if West Chicago does not have litigable contentions, a hearing offered at the time of the first request might have been over by now.

³ *Seacoast Anti-Pollution League v. Costle*, 572 F.2d 872, 876 (1st Cir. 1978). *U.S. Steel Corp v. Train*, 556 F.2d 822, 833 (7th Cir. 1977). *Marathon Oil v. Environmental Protection Agency*, 564 F.2d 1253, 1262-3 (9th Cir. 1977).

ADDITIONAL VIEWS OF COMMISSIONER AHEARNE

Contrary to the suggestion in Commissioner Bradford's dissent, the Commission in the Erwin case indicated that this agency has never held that Section 189a requires a formal hearing in materials license cases. *Nuclear Fuel Services, Inc.* (Erwin, Tennessee), CLI-80-27, 11 NRC 799, 802, note 4 (1980).



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Thomas S. Moore, Chairman
Dr. W. Reed Johnson
Dr. Reginald L. Gotchy

In the Matter of

Docket Nos. 50-266 OLA
50-301 OLA

**WISCONSIN ELECTRIC POWER
COMPANY**

(Point Beach Nuclear Plant,
Units 1 and 2)

February 12, 1982

The Appeal Board grants intervenor's motion in this operating license amendment proceeding to dispense with oral argument and to submit the appeal on briefs.

RULES OF PRACTICE: MOTIONS

A party seeking relief should timely file a written motion served on all parties in accordance with the Commission's Rules of Practice. Such motion, *inter alia*, "shall state with particularity the grounds and the relief sought, and shall be accompanied by any affidavits or other evidence relied on" 10 CFR 2.730(b).

RULES OF PRACTICE: ORAL ARGUMENT

A party which, for sufficient reason, cannot attend an oral argument should request that the appeal be submitted on briefs. Any such request, however, must be adequately supported.

RULES OF PRACTICE: ORAL ARGUMENT

If not requested by a party, oral arguments are scheduled by an Appeal

Board when one or more members of the Board have questions of the parties. See 10 CFR 2.763.

RULES OF PRACTICE: ORAL ARGUMENT (RESPONSIBILITIES OF PARTIES)

All parties in Commission proceedings are expected to be present or represented at oral argument unless specifically excused by the Board. See *Camps v. C&P Telephone Co.*, No. 80-1799, slip opinion at 15, n. 59 (D.C. Cir. December 31, 1981). Such attendance is one of the responsibilities of parties when they participate in Commission adjudicatory proceedings.

MEMORANDUM AND ORDER

On January 20, 1982 we scheduled oral argument for February 10 in Bethesda, Maryland, on the appeal of intervenor Wisconsin's Environmental Decade from the Licensing Board's authorization of an operating license amendment for Wisconsin Electric Power Company's Point Beach Nuclear Plant, Unit 1. The authorization permits licensee to operate Unit 1 after sleeving as many as six steam generator tubes which are over 40 percent degraded.¹

On February 9, 1982 we received a letter dated January 26, (but postmarked February 4)² from Environmental Decade's counsel stating, without elaboration, that intervenor lacks the financial resources to attend the oral argument. The letter requests agency funding "to reimburse the attendant costs" for counsel and declares that "[a]bsent such reimbursement, the Intervenor will not be able to participate in the argument and would rest on the papers filed."

We set this appeal for argument because we had numerous questions of intervenor's counsel regarding its position — questions which are not answered by intervenor's generally inadequate brief. At the eleventh hour we were informed that, absent funding, counsel for intervenor would not appear at the argument. In light of the fact that agency funding of intervenor participation is proscribed by Section 502 of Pub. L. No. 97-88, 95 Stat. 1135 (1981), intervenor's funding request must be denied. Moreover, intervenor must bear full responsibility for any possible misapprehension of its position caused by the inadequacies of its brief and its determination not to attend oral argument to respond to Board questions. In the

¹ The technical specifications for Point Beach Unit 1 normally require a tube degraded to this extent to be plugged in order to remove it from service.

² The letter is postmarked Madison, Wisconsin, which is the location of intervenor's offices.

circumstances, we shall construe counsel's declaration that, absent funding, intervenor rests on the papers filed as a motion to dispense with oral argument and to submit the appeal on briefs. On that basis, we grant the motion.³

We have accommodated Environmental Decade's request to submit the appeal on briefs. We caution intervenor and others practicing before us that future requests in the manner and form of intervenor's filing here may not receive such favorable consideration.

A party seeking relief should file a written motion served on all parties in accordance with the Commission's Rules of Practice. Among other things, such motion "shall state with particularity the grounds and the relief sought, and shall be accompanied by any affidavits or other evidence relied on" 10 CFR §2.730(b). See also 10 CFR §2.701. Here, intervenor did not file a motion nor did it seek a proper form of relief. Rather, intervenor sent a letter announcing that, absent public funding, it would not participate in the oral argument. If for sufficient reason a party cannot attend an oral argument, it should request that the appeal be submitted on briefs. Any such request, however, must be adequately supported. A bare declaration of inadequate financial resources such as that filed by intervenor is clearly deficient. Indeed, in this instance it appears that Wisconsin's Environmental Decade is a substantial organization. Its letterhead lists an organization staff of 10 individuals (quite apart from its 17 member Board of Directors) and its brief informs us that Environmental Decade has over 50,000 members. A party's inadequate resources may justify dispensing with oral argument but such a determination by the Board is impossible without proper substantiation by the movant.⁴

If not requested by a party, oral arguments are scheduled by an Appeal Board when one or more members of the Board have questions of the parties. See 10 CFR §2.763. All parties are expected to be present or represented at oral argument unless specifically excused by the Board. See *Camps v. C&P Telephone Co.*, No. 80-1799, slip opinion at 15 n. 59 (D.C. Cir. December 31, 1981). Such attendance is one of the responsibilities of all parties when they participate in Commission adjudicatory proceedings. We appreciate that on occasion a party may be unable to fulfill this responsibility because of financial hardship. Upon a proper motion in such

³ Prior to the scheduled day of the argument the Secretary to the Appeal Board notified all counsel by telephone that the argument was canceled.

⁴ We do not imply that a complete balance sheet is necessary. Rather we require that modicum of information that will permit us to judge objectively the validity of the requested relief. For example, an affidavit executed by the treasurer or other appropriate official briefly setting forth the general resources and obligations of the organization and stating why attendance is impractical often will suffice.

cases we will dispense with argument, excuse the party or make some other arrangement.⁵ But it is another matter entirely if a party seeks to avoid this appellate responsibility by interposing impecuniousness as an excuse.

Although it should be obvious, all parties seeking relief must timely request it. Here, we did not receive intervenor's letter until February 9, one day before the scheduled argument. This inconvenienced not only us, but in all probability the other parties as well. Our order scheduling oral argument was issued January 20 and that same day the Secretary to this Board read the order over the telephone to counsel for all parties. Yet intervenor's letter, although dated January 26, is postmarked February 4. The fact that more than a week apparently elapsed between the writing of counsel's letter and the time it was deposited in the mail⁶ evidences, at the very least, a complete disregard for intervenor's responsibility to seek timely relief. Unfortunately, the time between the two dates may also imply a deliberate attempt to mislead.⁷ We prefer, however, not to interpret it in this manner and trust intervenor and others similarly situated will avoid such actions. In the future, when a party mails any motion requesting specific relief, counsel may wish contemporaneously to telephone the Secretary of this Board and convey the substance of the motion if there is any doubt concerning its timely receipt by the Board.

It is so ORDERED.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the Appeal Board

⁵ Although Commission policy provides that appellate arguments generally will be in Bethesda, Maryland, see 10 CFR Part 2, Appendix A, IX(e), a party may, for adequate cause, move to have oral argument in another location. Although we need not rule definitively on the point here, it may be that, given the prohibition on agency funding of intervenors (see p. 280-281, *supra*) financial hardship does not of itself provide an adequate basis for such a motion.

⁶ Intervenor notified NRC staff counsel of record by telephone on February 4, that it was sending a letter to this Board regarding oral argument. Shortly thereafter, we learned of intervenor's message from the staff who extended to us the courtesy of a telephone call. The timing of the intervenor's telephone call to the staff confirms that the February 4 postmark on intervenor's letter is a reasonably accurate indication of when it was placed in the mail.

⁷ In our order setting the case for argument we stated that the Secretary of the Board "shall be provided by letter mailed no later than February 3, 1982, the names of the counsel who will present argument on behalf of the respective parties." We regularly request this information from all counsel so that prior to argument we know the names of all counsel appearing before us. The February 3 date mentioned in our order cannot reasonably be interpreted as a license to mail on that date a request to dispense with oral argument. Indeed, the fact that intervenor's letter is dated January 26 suggests counsel placed no such construction on our order.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Peter B. Bloch, Chairman
Jerry R. Kline
Hugh C. Paxton**

In the Matter of

**Docket Nos. 50-266-OLA
50-301-OLA**

**WISCONSIN ELECTRIC POWER
COMPANY**

**(Point Beach Nuclear Plant,
Units 1 and 2)**

February 2, 1982

The Board decides that an intervenor need not specify particular portions of an allegedly proprietary document that it wants released to the public, nor need it provide reasons for release of portions to the public, providing that it has specified with reasonable particularity which sections it wants released and has provided its overall reasons for release. The issue arose with respect to the possible release to the public of safety tests which were claimed to be proprietary and entitled to be withheld from the public.

The Board also decided that it has the discretion to decide confidentiality issues regardless of whether they have been raised by a party, providing that it finds the staff determination of confidentiality issues to be unsatisfactory.

RULES OF PRACTICE: RECONSIDERATION

When a Board has reached a determination of a motion in the course of an on-the-record hearing, it need not reconsider that determination in response to an untimely motion but it may, in its discretion, decide to reconsider on a showing that it has made an egregious error.

RULES OF PRACTICE: CONFIDENTIALITY

An intervenor's burden in specifying portions of allegedly proprietary documents for release to the public is analogous to the burden of a person requesting information pursuant to the Freedom of Information Act. Generally, the burden is on the person wishing to withhold information and not on the requester.

RULES OF PRACTICE: CONFIDENTIALITY

The Board may, pursuant to the general powers of a presiding officer, decide whether or not portions of the record should be withheld from the public. It is not necessary that an intervenor raise this issue. However, it is not always appropriate for the Board to act when the issue has not been raised. Whether or not it should act depends in part on whether it finds the staff's review satisfactory.

RULES OF PRACTICE: *SUA SPONTE* AUTHORITY

The Board's authority to consider substantive issues is limited by the *sua sponte* rule, but the same limitation does not apply to its consideration of confidentiality issues under standards set forth in 10 CFR §2.790.

MEMORANDUM AND ORDER

(Concerning the Burden of Going Forward on Confidentiality Issues)

On January 28, 1982, in the course of an on-the-record telephone conference, Westinghouse Electric Corporation (Westinghouse), insisted that it be given greater notice concerning the specific sections of the Westinghouse Sleeving Report that Wisconsin's Environmental Decade (Decade) would like to be released to the public. Tr. 970-973. Westinghouse is supported by Wisconsin Electric Power Company (applicant) and by the staff of the Commission (staff). It is opposed by Decade, which argues that the Board already ruled on this same issue, that the present argument contributes to unnecessary delay in the proceeding and expense to Decade, and that Westinghouse has been sufficiently informed of Decade's claim.

Because of the importance which Westinghouse attaches to retaining the confidentiality of this information and because the staff attempted to buttress the Westinghouse claim by citing a string of Commission decisions

to us, we continued the January 28 telephone conference and reconvened for two full hours on February 1, 1982. After consideration of this record, including those precedents which the staff argued were most relevant, we have determined that Westinghouse's motion for elaboration of confidentiality claims should be denied. In the course of this opinion, we also attempt to clarify the scope of the Board's concern about confidentiality.

I. EFFECT OF OUR PREVIOUS RULING

At the conclusion of the October 29-30, 1982, hearing in Wisconsin applicant argued that if a party wants allegedly proprietary information disclosed to the public that it should come forward with a motion stating reasons why information should not be held proprietary and defining or identifying the material to which its reasons apply. Tr. 718. Applicant argued that failure to follow this procedure could result in a protracted hearing in which the proprietary nature of each page of the Westinghouse Sleeving Report would be litigated separately. Tr. 719.

At that time, Decade responded that it had already made its arguments sufficiently clear. Tr. 720. A point of disagreement about the degree of specificity of Decade's request for public disclosure then arose. Tr. 721. Judge Bloch attempted to resolve the dispute by stating his understanding of Decade's argument. Tr. 721-722. Mr. Anderson then summarized the Decade argument himself:

[T]he countervailing interest of the public relating to the safety aspect of [the sleeving project] . . . exceeds any proprietary interest that the vendor may have when it comes to the safety test as opposed to the design parameters.

Tr. 722. Applicant then stated its understanding that Decade's motion had been filed and that it was up to it to respond, and the Board concurred in that interpretation. Tr. 723. The hearing was adjourned. *Ibid.*

Our review of this record persuades us that the Board did rule on the issue of whether Decade had to come forward with further arguments or further specificity. Applicant, which at that time represented Westinghouse's interests concerning confidentiality, was permitted to make whatever arguments it pleased. There was no request for further argument or for permission to file briefs; and there was no timely motion for reconsideration. Hence, that decision of the Board should stand as final.

On the other hand, we are aware that events at the close of a hectic two day hearing schedule are not always conducive to careful, measured decision making. Consequently, we listened to the untimely arguments of Westinghouse, applicant and staff. Had we been persuaded that we had made an egregious error, we might have acknowledged error and have rescinded our ruling. Since these arguments were presented by distin-

gushed counsel with long experience in Commission proceedings, we considered it possible that we had made such an error and listened patiently. However, after reviewing the key authorities cited to us, we find no such egregious error and we therefore decline to exercise the discretion to review the procedural ruling we made on October 31, 1981.

The remainder of this decision presents the analysis which led us to conclude that we had not been in error and it attempts to suggest efficient paths which Westinghouse may choose in order to expedite this phase of the proceeding.

II. BURDEN OF GOING FORWARD

Westinghouse and applicant based their arguments about the need for increased specificity from Decade largely on general principles on law. Staff bore the principal burden of suggesting applicable precedent. Initially, staff provided us with three case citations. Tr. 1000. Then, by telephone call on January 29, 1982, it provided us with a list of 13 additional citations to authority. In response, the Board telephoned staff and requested to know: (1) the effective date of 10 CFR §2.790, (2) whether any of the authorities brought to our attention has cited §2.790, and (3) the relevance of these authorities. See Tr. 1007.

In oral argument on February 1, staff relied on *Commanche Peak*, CLI-81-24 (December 21, 1981) (limiting sua sponte authority), on *Wisconsin Electric Power Company, et al., (Point Beach Nuclear Plant, Unit 2)*, ALAB-137, 6 AEC (1973) 491, 513 and 514; on *Wisconsin Electric Power Company, et al., (Point Beach Nuclear Plant, Unit 2)*, LBP-73-9, 6 AEC (1973) 152, 155, 164 and 167; on *Pacific Gas and Electric Company (Diablo Canyon Nuclear Power Plant, Units 1 and 2)*, ALAB-600, 12 NRC (1980) 3, 10; and on *in the Matter of Northern States Power Company (Monticello Nuclear Generating Plant Unit 1)*, ALAB-16, 4 AEC (1970) 435, 439 (footnote 1). Westinghouse cited *Selected Issuances of the Atomic Energy Commission . . . in the Rulemaking Proceeding on . . . Emergency Core Cooling Systems . . .*, TID-26713 (March 1975, USERDA)(hereinafter "ECCS Proceeding") and "basically agreed with the staff's interpretation of the cases they have cited." Tr. 1037.

We have reviewed each of the cases cited with respect to the issue before us: the extent of the obligation of an intervenor to specify portions of a document which should be released to the public. We shall discuss our review in the ensuing portion of this memorandum. However, we must comment at the outset that these cases do not appear to require any greater specificity from an intervenor than the specification of a document which should be released. None of these cases appears to have required

that portions of a document be pointed out or that specific arguments concerning release be addressed to portions of documents.

Before we begin our review, we note that §2.790 was amended in 1976 to require that a proposal to withhold documents as proprietary be accompanied by an affidavit stating "the full reasons on the basis of which it is claimed that the information should be withheld from public disclosure" (10 CFR §2.790(b)(1)(ii)). The affidavit requirement should be interpreted in light of the succeeding section which places the submitter on notice of the Commission's policy to balance the interests of protection and disclosure against one another. 10 CFR §2.790(b)(2). The effect of this amendment of the regulations on procedures concerning proprietary information has not been addressed in any of the cited cases.

The Board concludes that these provisions were designed to permit a decision on a proprietary claim entirely based on the affidavit and the filed document. *See also* Tr. 1008 (staff agrees with this basic proposition). Hence, we also conclude that applicant must carry the full burden of persuasion in the affidavit or risk disclosure of all or part of the document. Additional procedures, such as we have authorized, are discretionary and not a matter of right. In this case, we believe additional procedures to be appropriate because of the importance of the material to Westinghouse, but this discretionary determination does not disturb the basic principle that the submitter has the burden to come forward with reasons for nondisclosure and to carry the burden of persuasion for non-disclosure.

We find the *Point Beach* (ALAB-137) decision relevant to burden-of-going-forward questions, but it does not reach so far as staff would have it. In that case, there were voluminous discovery materials produced through discovery requests, but many of the documents were not material and would never become part of the record. *Point Beach* at 513. Consequently, the Board, with the Appeal Board's approval, requested that intervenors identify particular, relevant documents which ought to be disclosed to the public. *Id.* at 513. Furthermore, despite the refusal to specify documents, the Board (apparently on its own motion) gave intervenors the opportunity to have a hearing on one allegedly proprietary document that had been introduced as an exhibit. *Id.* at 514. There does not appear to have been any prior requirement that intervenors provide reasons why the exhibit be disclosed or specify portions of the exhibit in which it was interested. *Ibid.*

The ECCS Proceeding also is instructive. The Commission's decision, at 27-28, makes no mention of any burden of going forward or burden of proof imposed on intervenors. It approves of Board requirements imposed on submitters. *Id.* at 26. It also states:

The Commission is mindful . . . of the strong public interest in conducting a rule making proceeding which is as open as possible

to full public scrutiny. Open consideration of the technical issues involved in this rule making matter was a motivating factor for the Commission in its experimental use here of a public rule making hearing. However, as our prior resume of the Board's rulings should make clear, *the ground rules are rigorous for information's qualifying as proprietary and their purport is to hold to an essential minimum that data which will not be considered in open hearing session.*

In the latter connection, we would underscore that our present holding is confined to treatment of proprietary information during the hearing phase of this proceeding. *Should such information form part of the basis for the ultimate rule making decision, the Commission will again—and in that context—address the question of that information's public disclosure.*

[Emphasis added.]

Although the ECCS Proceeding was a rulemaking, its determinations are relevant in adjudicatory proceedings. *Kansas Gas and Electric Company et al., (Wolf Creek Nuclear Generating Station, Unit No. 1)*, ALAB-327, 3 NRC (1976) 408, 417. *Wolf Creek* established, in the context of discovery, that applicant must show a substantive, rational basis for withholding relevant information from the public as proprietary. *Id.* It also placed the burden of going forward and the burden of proof squarely on the possessor of the information that was sought. *Id.* at 418.

We also find *Monticello* (ALAB-16) instructive. That was a discovery case, not a public disclosure case. In considering the disclosure of documents grouped by the Licensing Board in *Category 2* (apparently on the Board's own motion), the appeal board reviewed individual references made within that document and made determinations as to each such reference, resulting in some releases. *Id.* at 437. The Appeal Board then cautioned the licensing board to take great care to avoid permitting the inclusion in the record of references of questionable relevance. *Id.* at 438. However, this citation does not support placing the burden of showing relevance on an intervenor, as the Appeal Board appears to have been addressing the Licensing Board directly and not to have been requiring any showing by the intervenor. (We fail to understand the relevance of footnote 1, page 439, which was cited by staff. We also consider *Diablo Canyon* irrelevant because the case dealt with disclosure of a security plan, a very special category of proprietary information.)

In this case, there is no question of the relevance of the information whose public disclosure is sought. All of the information was filed by applicant in support of the safety of tube sleeving, which is the subject of this proceeding. Furthermore, the material most hotly contested is the

safety tests that were conducted. By definition, these tests are relevant to this proceeding.

Furthermore, there is no question of the sufficiency of Decade's request. Under the Freedom of Information Act, all that is necessary to request a document is that the document be sufficiently well specified so that the agency will know what document is requested. No reason for disclosure need be supplied. The shoe is on the other foot. Everything is disclosed unless the submitter or the agency has a reason for its non-disclosure. In addition, each reasonably segregable part of a document must be treated separately, so that a submitter must provide reasons for the withholding of each part of a document—unless privileged matter is so heavily intertwined with nonprivileged matter that "segregation" of these separate matters is not practicable. *See, e.g., Collier, Shannon, Rill & Scott*, 8 DOE ¶80,129 (1981) and *Exxon Company, U.S.A.*, BFA-0609, Decision and Order of the Department of Energy, *slip op.*, February 18, 1981 (interpreting the Freedom of Information Act and citing a long history of court and DOE decisions).

Although the Freedom of Information Act (FOIA) is not directly applicable in our proceeding, 10 CFR §2.790 is similar in its intent. Furthermore, it is appropriate to interpret that section in parallel to the FOIA, which is another avenue by which citizens may obtain the public release of information. There is no reason to believe that information should be less readily available in these proceedings, which bear directly on important issues of public welfare and safety, than in the regular course of FOIA requests, which are appropriate for information of far less public interest and concern.

We note that in one portion of the record Decade appears to have limited its concern about public disclosure to exclude "numbers". However, we consider this solitary statement to have been an example of over-cooperativeness that was inconsistent with the otherwise consistent position of Decade that it is interested in the disclosure of safety tests. In particular, we note that many of the test results would be meaningless if the results were disclosed but the numbers were not.

We also note that Decade has restricted its interest to the disclosure of chapters 6, 7 and 9 of the Sleevng Report. For the most part, our interests coincide with Decade's. However, we are also concerned about the appendices to the Sleevng Report and about marked portions (if any) of the answers to Board questions and Decade interrogatories—to the extent that these materials deal with safety tests. Also, we reserve the right to become concerned about any portion of the San Onofre Sleevng Report, submitted as part of our record, which might be directly relevant to the initial decision in this case. That concern need not, however, be addressed in briefs and hearings that have already been scheduled.

We reject again applicant's argument that we may not consider confidentiality issues *sua sponte*. We are responsible for conducting this proceeding fairly and responsibly. The issuance of a reasoned opinion is part of our responsibility, and we bear the corrolary responsibility for developing a record which, consistent with other Commission policies, is open to public scrutiny. 10 CFR §2.718. The limitation on our *sua sponte* authority affects our pursuit of substantive issues but does not limit our exercise of our procedural discretion. Furthermore, even if the *sua sponte* rule applied, it would not prohibit a Board from inquiring further into an issue already raised.

It would not always be appropriate for the Board to take up proprietary matters on its own. As applicant clearly has pointed out, that responsibility lies in the first instance with staff. Tr. 1043-1045. To the extent that we have previously said otherwise, we stand corrected. However, the proprietary issue has been raised in this case and is ripe for our determination. Furthermore, we find that the staff's review of this document was inadequate because it made no attempt to segregate releasable information from non-releasable information and it did not separately address the possible releasability of the results of safety tests. Consequently, we consider our review of these determinations to be necessary.

III. PROCEEDING EFFICIENTLY

Since Westinghouse has the burden of going forward, it also has an important obligation to go forward in a way that will economize on time. Any rational system of organization for its presentation likely will be accepted by us. One way to proceed would be for Westinghouse to demonstrate which of its safety tests have special proprietary value, indicating in each instance the nature of that value. Then the Board could review the testimony in light of the Safety Evaluation Report and weigh the demonstrated proprietary value against the nature of the information that would be withheld from the public if the nature of the test or the results of the test were withheld. However, we encourage Westinghouse to think through its method of presentation and to adopt whatever method seems most suitable for the conduct of an efficient proceeding.

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is this 2nd day of February, 1982,

ORDERED

(1) Wisconsin's Environmental Decade need not file any further speci-

fication of its claim that documents of Westinghouse Electric Corporation should be released to the public.

(2) This is an interlocutory order that is not subject to appeal.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Peter B. Bloch, Chairman
Dr. Oscar H. Paris
Mr. Frederick J. Shon

In the Matter of

Docket No. 50-155
(Spent Fuel Pool Amendment)

CONSUMERS POWER COMPANY
(Big Rock Point Plant)

February 5, 1982

Summary disposition is denied with respect to a contention that the chain reaction constant (K_{eff}) in a spent fuel pool may exceed standards generally applied by the Commission's staff. The principal error alleged to have been committed by applicant and staff in their calculations was failure to allow for boiling of the fuel pool at temperatures of up to 247° F, which may occur at the bottom of the pool, where the water is under pressure because of the column of water above it.

TECHNICAL ISSUES DISCUSSED:

Fuel Pool Boiling;
Chain Reaction Constant in Spent Fuel Pool;
 K_{eff} in Spent Fuel Pool.

MEMORANDUM AND ORDER
(Denying Summary Disposition of Criticality Contention)

After reviewing the motion for summary disposition of a contention dealing with the calculation of criticality in the spent fuel pool, we have concluded that there is a genuine issue of fact and that the motion for summary disposition must therefore be denied. Although our decision on other aspects of the motions for summary disposition has not yet been completed, we decided to issue this separate opinion because of the seriousness of the issues raised by intervenors.

The criticality contention is only one of several contentions which have been addressed in motions for summary disposition. Consumers Power Company (applicant) and the staff of the Nuclear Regulatory Commission (staff) both filed motions for summary disposition on October 5, 1981. These motions were opposed by Christa-Maria, Jim Mills and Joanne Bier (Christa-Maria) and by John O'Neill in filings of December 11 and 14, 1981 and in an additional, updated filing by Mr. O'Neill. Christa-Maria also filed a "Supplemental Memorandum" on January 28, 1982.

I. THE CONTENTION

O'Neill contention II E-3 states:

The application has not adequately analyzed the possibility of criticality occurring in the fuel pool because of the increased density of storage without a gross distortion of the racks.

If this contention is true, its implications are serious. The importance of criticality analyses has been recognized by the Commission, which requires substantial margins of safety in the calculation of criticality. The attainment of criticality would initiate a self-sustaining nuclear reaction.

The analyses submitted in this case were performed and reviewed by experts. Dr. Yong S. Kim, a nuclear engineer employed by NUS Corporation, has an M.S. in Nuclear Engineering from the Massachusetts Institute of Technology and a Ph.D. from the Catholic University of America; he has over 20 years of relevant professional experience. He performed the calculations for applicant. Mr. Edward Lantz, a Senior Reactor Engineer who reviewed the criticality analysis for the Commission, a B.S. in Engineering Physics from the Case Institute of Technology and a Masters of Science degree in Physics from Union College; he has 20 years professional experience in the nuclear field.

The analysis of criticality apparently was found acceptable by the staff. Lantz at 3-4. Commission practices require that these calculations incorporate conservative assumptions that allow substantial room for error. For example, the calculations assume that there is fresh fuel in the spent fuel pool rather than the spent, less active fuel placed there. Kim at 9, 11. The pool water is assumed to be boiling, which increases calculated reactivity. Kim at 9. The calculation assumes, contrary to fact, that no neutrons are lost from the system. Kim at 3-4. A variety of accident scenarios are considered, including earthquake. Kim at 10-11. *See also* Lantz at 1-5 (at ¶ 15, p. 4, concluding that neither fuel pool cooling nor the water itself is required to prevent criticality in the low enriched fuel); SER 3-1 to 3-2.

II. ANALYSIS OF INTERVENOR'S ARGUMENT

On January 29, 1981, Christa-Maria submitted an argument opposing summary disposition of O'Neill Contention II E-3. The argument was not supported by any affidavits or documentary evidence. Nevertheless, we have concluded that the argument is basically correct and that it demonstrates the existence of a genuine issue of fact. The argument is:

Criticality analysis performed by Dr. Kim is based on a water temperature of 212°F, assuming boiling of the spent fuel pool, with the containment at atmospheric pressure. Even assuming that the containment is at atmospheric pressure (not necessarily conservative after a LOCA [loss of coolant accident]), the pressure at the bottom of the spent fuel pool, due to the hydrostatic load is 28.14 psia. The boiling temperature at that pressure is 247°F. Since the effective activity coefficient K is not permitted to exceed 0.95, and since Dr. Kim's calculations reached this maximum, assuming 212°F, it is questionable if the calculations can be considered conservative.

This statement triggered a thorough review by the Board. We found that Dr. Kim adopted the "conservative" assumption that water in the pool would boil at 212°F. Kim at 9. Kim's most recent calculation, using that assumption, is that k_{eff} is .9500, which is the maximum allowable figure under existing Commission guidance. Kim at 12; Standard Review Plan (NUREG-0800) p. 9.1.2-3 at §II(5) and Proposed Revision 2 to Regulatory Guide 1.13, p. 1.13-9 to 15 at §1.2 (k_{eff} not to exceed 0.95). See also *Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Reactor Fuel* (March 1978, NUREG-0404) Vol. 2 at B-19 (212°F is the maximum possible spent fuel pool temperature). Although this guidance may not be strictly controlling in our proceeding, deviation from it would require careful explanation.

Furthermore, we find that intervenor's assertion concerning a boiling temperature of 247°F is consistent with our own calculations. It also is consistent with applicant's assertion elsewhere in our record that the water in the fuel pool at a depth of 21.4 feet, which is the location of the top of the stored fuel, would reach 237°F. Affidavit of Daniel A. Prelewicz concerning Christa-Maria contention 8, at 4. In addition, applicant also has estimated that in a TMI II-type accident (the subject of Christa-Maria 8 and O'Neill III E-2) there could be an overpressure of 23 psig in the containment. Affidavit of David P. Blanchard concerning Christa-Maria contention 8, at 3. This overpressure could further increase k_{eff} by further increasing the boiling temperature of water at the pool bottom.

We also have reviewed the history of calculations of k_{eff} in this proceeding and have found that the staff review may have been less than

adequate. Consumer Power Company's Safety Analysis of April 1979 stated, at pp. 4-7, that the Maximum k_{eff} is 0.9456. However, in his affidavit concerning summary disposition, Dr. Kim stated that the maximum k_{eff} was 0.9500. Kim at 12. The apparent explanation for the discrepancy is that .0044, the contribution to maximum k_{eff} from the formation of bubbles due to boiling, was not included in the Safety Analysis. Nevertheless, the Staff's Safety Evaluation Report accepted the k_{eff} as 0.946—apparently a rounding-off of the figure originally provided by applicant. SER at 3-1.

These problems give rise to additional doubts. For example, neither applicant nor staff has explained how they have calculated the effect on k_{eff} of small bubbles. Lance at 4 (¶14), Kim at 11. In addition, Dr. Kim has stated that fuel handling accidents, including a drop of a fuel assembly and the inadvertent placement of a fuel assembly between a rack assembly and the pool wall, do not have a significant effect on k_{eff} . Kim at 9-10.

However, there apparently was no consideration of possible distortion of the racks from a drop of a fuel assembly, although such consideration would seem appropriate when k_{eff} is at the highest permissible limit, 0.9500. Safety Analysis at 4-8 to 4-9. Furthermore, no consideration appears to have been given to possible distortion of racks during heating.

We also cannot help but wonder whether staff's acceptance of applicant's analysis means that staff did not independently analyze k_{eff} using its own assumptions and computer codes. Given the importance of this analysis, independent review by staff is necessary.

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is this 5th day February, 1982,

ORDERED

To the extent that the Motions for Summary Disposition filed on October 5, 1981, by Consumers Power Company and the staff of the

Nuclear Regulatory Commission addressed O'Neill contention II E-3, relating to the adequacy of analyses of the criticality of the expanded fuel pool, those motions are denied.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

**Oscar H. Paris
ADMINISTRATIVE JUDGE**

**Frederick J. Shon
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Ivan W. Smith, Chairman
Dr. Walter H. Jordan
Dr. Linda W. Little**

In the Matter of

**Docket No. 50-289
(Restart)
(Reopened Proceeding)**

**METROPOLITAN EDISON
COMPANY
(Three Mile Island Nuclear
Station, Unit No. 1)**

February 5, 1982

The Licensing Board denies NRC Staff Motion for Review of Special Master's ruling with respect to "Staff attitude".

EVIDENCE: RELEVANCE OF STAFF ATTITUDE

Special Master's order inquiring into the NRC Staff's attitude in administering NRC operator license examinations was not concerned with attitude *qua* attitude, but with the resources committed and care taken in administering the examinations. Such considerations are relevant to the reopened proceeding concerning cheating on the TMI-1 operators' license examinations.

**RULES OF PRACTICE: DISCRETIONARY INTERLOCUTORY
REVIEW**

Interlocutory review of the Special Master's order was inappropriate in any event under the standards of *Public Service Co. of Indiana* (Marble Hill, Units 1 and 2), ALAB-405, 5 NRC 1190-92 (1977). The Staff already had prepared and presented testimony on NRC Staff attitude, so that any "immediate and serious irreparable impact" was no longer threatened but a

fait accompli; and Staff failed to show that this matter had affected the proceeding improperly in a pervasive and unusual manner. The issue was either moot or perishingly moot by time of filing.

**MEMORANDUM AND ORDER DENYING
STAFF'S NOVEMBER 9, 1981 MOTION FOR REVIEW OF SPECIAL
MASTER'S RULING WITH RESPECT TO "STAFF ATTITUDE"**

The Special Master, Judge Gary L. Milhollin, required a special evidentiary presentation on the possible relationship between any defeatability of the NRC operator examinations and the NRC Staff's "attitude". In his order of October 8, 1981 he stated the scope and basis for this requirement:

- (2) In general, are the NRC examinations administered in such a way as to assure that operating personnel are qualified for their positions?

.

- (f) *Attitude of the NRC Staff.* The Kemeny Commission found that operator training was greatly deficient: that the depth of understanding was far too shallow. It also found that the branch of NRC that monitored operator training was "weak and understaffed" and that NRC limited itself to "giving routine exams". It concluded that no quantity of "fixes" would cure the basic problem, which it found to be the attitude of the people who were involved. Because the cheating incident occurred after the Staff had responded to the Kemeny Commission and promised to improve, what does the possibility of laxity in the Staff's procedures indicate about the Staff's attitude?

The Staff believed that the special question was irrelevant in that it raised an issue of the Staff's attitude *qua* attitude. The Staff requested Judge Milhollin to remove the question from the list of special evidentiary presentations.¹

In his unpublished October 27, 1981 Memorandum and Order denying the Staff's request, Judge Milhollin stated that the Staff's attitude as such was not the issue. Rather, he explained, the Staff's attitude would be considered only as evidence of how the Staff's testing procedures might be administered. He gave as examples of how attitude and its effect upon procedures might be measured the resources committed, the extent to

¹ Staff October 15, 1981 Motion for Reconsideration or in the Alternative Motion for Directed Certification.

which procedures are followed, and the instructions given to proctors and graders. *Id.* at 2-3.

On November 9, 1981 the Staff filed with this Board its motion for review of Judge Milhollin's ruling. In its discussion of the relevancy of the "attitude" question, the Staff recognizes that the Staff's testing procedures are relevant to Issue 10 of the reopened proceeding,² but continues to maintain that Staff's respective attitude has no relevance. *Id.* at 5-6. It makes the demurrable argument that there is no inherent correlation between the attitude of the Staff and its ability to properly develop and implement its procedures, and that even a good attitude could produce poor test procedures. *Id.* at 6. As far as we can discern from its pleadings, the Staff seems not to understand Judge Milhollin's definition of Staff "attitude". We suspect that the use of the word "attitude" and the reference to the Kemeny Report was an irritant to the Staff. But we do not believe Judge Milhollin intended any pejorative meaning such as personal indifference to the importance of the NRC examinations. Instead, his explanation of the relevance of the "attitude" question indicates that he was particularly interested in the resources committed and the care taken in administering the examinations.

The Staff agreed at the beginning of the reopened hearing that Issue 10 was appropriate for hearing. That issue expressly centers on the "adequacy of the administration" of the NRC licensing examinations. Thus, Issue 10 is not limited to a review of the stated procedures for the NRC examinations — the actual administration of them is in issue. The question is relevant, perhaps even necessary to a proper resolution of Issue 10. In view of the preliminary information then available to Judge Milhollin concerning alleged voids in the Staff's monitoring of the April 1981 licensing examination, he acted prudently and had a sound basis for raising the question. For these reasons alone we deny the motion for review of his order.

There is another independent reason why the motion must be denied. Citing *Public Service of Indiana* (Marble Hill, Units 1 and 2), ALAB-405, 5 NRC 1190, 1192 (1977), the Staff acknowledges that we should, under the procedures established at the beginning of the reopened hearing, undertake interlocutory review of Judge Milhollin's ruling only where there

² Issue 10 states:

The adequacy of the administration of NRC licensing examinations for TMI-1 personnel, including proctoring, grading and safeguarding the integrity of examination materials; in addition, the adequacy of the Staff's review of the administration of Licensee's Category T examinations; also the adequacy of the Staff's plan for retesting operators and monitoring its NRC examinations to assure proper adherence to NRC testing requirements and to provide reasonable assurance that TMI-1 can be operated safely.

is (1) either a threat of immediate and serious irreparable impact to the Staff which, as a practical matter could not be alleviated in a later appeal, or (2) where the issue sought to be reviewed affects the basic structure of the proceeding in a pervasive or unusual manner. Motion at 13.

The asserted immediate, serious and irreparable impact offered by the Staff is that it already had been required to prepare "attitude" testimony and the Staff would thereafter be required to present the testimony. Motion at 14. At the time the motion was filed (on November 9), the testimony had already been prepared (by November 3). The hearing was scheduled to begin and did begin the following day (November 10). Allowing time for other parties to answer the Staff's motion, the motion would not have been ripe for ruling until November 24 at the earliest. But by then some of the cognizant Staff witnesses had already testified. The remaining Staff witness had testified by December 2. There was scant time for the Board, if it had been so inclined, to grant any of the relief sought by the Staff. In short, the motion was moot or perishingly moot by the time it was filed. Yet the Staff requested no special expedition.

The Staff continued to press the issue in its January 15, 1982 proposed findings on the reopened proceeding (at 2-3) and asserts that the Staff, while preserving its position, did indeed introduce testimony on the subject of Staff attitude. But still there is no request to this Board for relief except for the original Staff prayer that the Special Master's ruling be reversed.

What would be the consequence of that reversal? The Staff identifies nothing that it wants struck from the record. Nor does the Staff admit to having introduced irrelevant evidence; nor can we identify any of the Staff's proposed findings on "attitude" (PF ¶¶ 211-16) which urge the Board to make findings patently irrelevant to the issues before us and the Special Master. Now that the matter is *fait accompli* the Staff in its proposed findings should have, but did not identify how Judge Milhollin's ruling actually and improperly affected the reopened proceeding.

Accordingly, the Staff's motion for review is denied both as an interlocutory matter and on the merits as if on post-hearing review. This ruling means only that the question was properly raised at the hearing. We have not yet decided the factual merits of that question.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

Ivan W. Smith, Chairman
ADMINISTRATIVE LAW JUDGE

Bethesda, Maryland
February 5, 1982

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**ATOMIC SAFETY AND LICENSING BOARD**
Before Administrative Judges:**Peter B. Bloch, Chairman**
Dr. Oscar H. Paris
Mr. Frederick J. Shon**In the Matter of****Docket No. 50-155-OLA**
(Spent Fuel Pool Amendment)**CONSUMERS POWER COMPANY**
(Big Rock Point Plant)**February 19, 1982**

The Board completes acting on Applicant and Staff motions for summary disposition of contentions. The most important issues to survive these motions are: (1) a contention that the expanded spent fuel pool would have a chain reaction constant K_{eff} that exceeds 0.95, the level generally permitted by Commission practice; (2) a contention that the safety of the reactor is compromised by a SAC, low-level bombing practice run that is 11.5 miles from the plant; (3) some issues relating to a contention that the fuel pool, which is located within the containment building, would not be safe during a core-damage (TMI-2 type) incident in which radiation inhibited entry into the containment for an extended period of time; (4) some issues relating to the reliability of Staff and Applicant analyses of the level of radiation to be emitted from the pool; (5) whether workers would receive radiation doses that are "as low as reasonably achievable" (ALARA) while installing the new spent fuel racks; and (6) whether there would be sufficient makeup water available following a caskdrop incident or a seismic incident in which the overhead crane might drop into the pool.

Summary disposition is granted with respect to contentions that the expansion of the fuel pool would induce unacceptable routine and accidental releases of radioactive materials, that small or medium-sized leaks in the spent fuel pool would cause environmental hazards, that there would be unacceptable corrosion of the pool and its components, and that fuel could escape the racks and remain undiscovered for a substantial period of time. Two Board questions, relating to the performance of certain specified valves and to the possibility of an Oyster Creek-type incident, also are dismissed.

In addition, the Board rules that certain late-filed affidavits should be received into evidence and it announces that it will convene a telephone conference for scheduling matters.

RULES OF PRACTICE: SUMMARY DISPOSITION

The Board discusses the conflicting objectives which must be accommodated in deciding a summary disposition motion.

RULES OF PRACTICE: SUMMARY DISPOSITION

The Board reinterprets some contentions to raise issues that were uncovered through discovery and that were not strictly within the contentions as initially worded.

RULES OF PRACTICE: EXTENSION OF TIME

The Board found good cause for late filing of three affidavits because the delay in filing did not cause any corresponding delay in the work of the Board and because Intervenors had demonstrated their seriousness and their ability to analyze complex issues in a helpful manner.

TECHNICAL ISSUES DISCUSSED:

- Chain reaction constant in spent fuel pool,
- K_{eff} in spent fuel pool,
- Criticality excursions in spent fuel pool,
- Zirconium/steam reactions,
- Radiolysis of steam facilitates reaction with zirconium,
- Aircraft-crash risk,
- As low as is reasonably achievable,
- Biological surveys,
- Corrosion (spent fuel pool),
- Dose calculations,
- Caskdrop incident (spent fuel pool),
- Expansion and operation of spent fuel pool,
- Emissions from spent fuel pool,
- Spent fuel storage rack installation,
- Intergranular stress corrosion cracking (spent fuel pool),

Spent fuel pool boiling,
Boiling temperature in spent fuel pool,
Occupational radiation dosage to workers engaged in modification
to spent fuel pool,
Safety of spent fuel pool located inside the containment,
Health Physics Program,
Radiological and bioaccumulation monitoring,
Release of radioactive materials in effluents (spent fuel pool),
Spent Fuel Pool (availability of makeup water),
Use of radwaste system to reduce radiation in spent fuel pool.

MEMORANDUM AND ORDER
(Concerning Motions for Summary Disposition)

Consumers Power Company (applicant) and the regulatory staff of the Nuclear Regulatory Commission (staff) both filed motions for summary disposition on October 5, 1981. These motions were opposed by Christa-Maria, Jim Mills and Joanne Bier (Christa-Maria) and by John O'Neill in filings of December 11 and 14, 1981 and in an additional, undated filing by Mr. O'Neill. These motions were filed after the parties had invested substantial time and money in the discovery process and when discovery was almost complete. If the motions are granted, the effect will be to preclude an evidentiary hearing on some or all of the issues which were admitted to discovery.

A decision on summary disposition can be a watershed in the history of a case. If motions are too readily granted, substantial safety or environmental issues may be excluded from the serious attention they deserve, and in some cases a nuclear power plant might be permitted to operate with a defect which should have been remedied. In such a case, the Commission may fail to live up to its important statutory responsibility to protect public safety and the environment. *See Report of the President's Commission on The Accident at Three Mile Island*, John G. Kemeny, Chairman (1979) at 7-9, 51.

On the other hand, the holding of evidentiary hearings is time consuming and expensive, and it is important that an agency with serious safety and environmental responsibilities not divert its attention from those serious issues. It is for these reasons that the Commission's summary disposition rule gives a party a right to an evidentiary hearing only when there is a genuine issue of material fact. An important effect of this principle is that applicants for licenses may be subjected to substantial expense and delay when genuine issues have been raised, but they are entitled to an

expeditious determination, without need for an evidentiary hearing, on all issues which are not genuine. 10 CFR §2.749; *Virginia Electric and Power Company (North Anna Nuclear Power Station, Units 1 and 2)*, ALAB-584, 11 NRC 451 (1980) at 453; *Statement of Policy on Conduct of Licensing Proceedings*, 46 Fed. Reg. 28533 (May 27, 1981).

I. APPLICABLE REGULATIONS

The parties are subject to rigorous requirements both in making and opposing motions for summary disposition.

The moving party must annex to its motion "a separate, short and concise statement of the material facts as to which the moving party contends that there is no genuine issue to be heard." 10 CFR §2.749. The opposing party must annex a "short and concise statement of the material facts as to which it is contended that there exists a genuine issue to be heard." *Id.*

When a motion for summary disposition is properly made, the rules state that an opponent "may not rest upon the mere allegations or denials of his answer; his answer . . . must set forth specific facts showing that there is a genuine issue of fact." 10 CFR §2.749(b).

As the Atomic Safety and Licensing Appeal Board has said:

[T]he Section 2.749 summary disposition procedures provide in reality as well as in theory, an efficacious means of avoiding unnecessary and possibly time-consuming hearings on demonstrably insubstantial issues

Houston Lighting and Power Company (Allens Creek Nuclear Generating Station, Unit 1) ALAB-590, 11 NRC 542 (1980) at 550.

II. CHRISTA-MARIA CONTENTION 8 AND O'NEILL CONTENTION III.E.-2

A. The Contention

These two contentions are identical and state:

The occurrence of an accident similar to TMI-2 which would prevent ingress to the containment building for an extended period of time would render it impossible to maintain the expanded spent fuel pool in a safe condition and would result in a significantly greater risk to the public health and safety than would be the case if the increased storage were not allowed.

In other words, intervenors contend that a loss of coolant accident could make it dangerous or impossible to enter the containment building, which houses both the reactor core and the spent fuel pool. They assert that the

difficulty of gaining access would result in loss of control over the fuel pool, greatly complicating the already dangerous situation. Indeed, intervenors are concerned that the stored fuel rods might melt, partly as the result of a reaction between the zirconium cladding on the fuel rods and steam from the water in the fuel pool. Although intervenors believe this to be a problem in the reactor at present, before the fuel pool is enlarged, they also state that the enlargement would significantly increase the problem.

B. Arguments for Summary Disposition

Staff argues that the TMI-2 type of accident is unlikely to happen at Big Rock because it is a boiling water reactor, with characteristics quite different from the pressurized water reactor that caused problems for TMI-2. NRC Staff Motion for Summary Disposition at 14. (Hereinafter Staff at 14.)

Were high radiation levels to bar entry into the containment, the affidavit of Walter A. Paulson, a chemical engineer and nuclear scientist serving as staff's manager of the Big Rock project, states that even in such an incident at least one of the two spent fuel pumps is likely to be in operation and will provide required cooling. Paulson at 2. However, both Staff and applicant assume for purposes of analysis that the cooling pumps in the pool would fail. Staff at 14. Applicant at 1. (Applicant filed separate briefs concerning each contention for which it sought summary disposition. We will use a uniform citation which should be understood to refer to the brief on the contention under discussion.) Nevertheless, these parties argue that there is no genuine issue concerning the safety of the planned expansion in the spent fuel pool.

The Paulson affidavit states, at p. 2, that even if both spent fuel cooling pumps fail immediately after the full core were placed in the pool for cooling, it would take 20 hours for the spent fuel pool to boil. Furthermore, Paulson assures us that even after the pool boils a maximum of only 9 gallons per minute would boil away. Paulson at 2. Furthermore, the staff has stated that applicant will install instruments to show the level of water in the spent fuel pool without having to enter the containment, and it has also stated that applicant will install a system which can be operated from outside the containment that will add 11 gallons per minute to the spent fuel pool, a rate that exceeds the anticipated rate of loss of water due to boiling. *Id. See also Safety Evaluation, May 15, 1981 (SER) at 3-4.* Paulson also states that the containment spray system could remove the heat generated by pool boiling and thereby prevent containment overpressurization. *Id.* at 3.

Applicant's expert, David P. Blanchard, is a nuclear engineer employed at the Big Rock Plant. Mr. Blanchard's affidavit sets forth, in some detail, the events that are expected to occur inside the containment were there a TMI-2 type accident. Mr. Blanchard states that the fuel pool cooling equipment, which may have to work in a high temperature and high humidity environment associated with a loss of coolant accident, has not been tested in that environment. Blanchard at 5. Consequently, Mr. Blanchard assumed that the equipment will fail. *Id.* at 6. He also assumed, conservatively, that cooling water and fuel pit pumps, which are located below the maximum permissible water level in containment, may become submerged and fail. *Id.* Should all of these assumptions come to pass, Mr. Blanchard recognizes that serious consequences could ensue, including boiling of the fuel pool, heating of the fuel rods, cladding failure and a release of additional fission products to the containment. *Id.* at 6.

Mr. Blanchard analyzes the possibility of these severe consequences. He states that there are about 22 feet of water above the fuel stored in the spent fuel pool. *Id.* at 6-7. He made further conservative assumptions, including occurrence of a LOCA as soon as the reactor restarts following fuel transfer to the fuel pool, at a time when the pool is completely filled with spent fuel. *Id.* Although three of the four walls of the pool would discharge some heat during such an incident, Mr. Blanchard also assumed that the only heat lost from the pool is through vaporization of water. *Id.* Also, he assumed that the containment sprays would not contribute to steam condensation. *Id.*

Using these assumptions (which do not include cooling of a full core) and applying the decay heat generation rate from American Nuclear Society Standard 5.1, Mr. Blanchard offers calculations showing that the boiling rate in the spent fuel pool would be 2 gallons per minute, thereby requiring one month for all the water above the fuel to boil away. *Id.* at 8. *See also* SER at 3-4.

Applicant also submitted affidavits from Dr. Daniel A. Prelewicz, a thermal and hydraulics engineer employed by NUS Corporation, and from Raymond F. Sacramo, a mechanical engineer employed by NUS Corporation. Mr. Prelewicz presented an analysis showing that the inoperability of the spent fuel cooling system following a LOCA would cause boiling in no less than 20 hours (Prelewicz at 2). He assumed that by 20 hours after a LOCA began the pressure in the containment would be normal and that, therefore, the boiling temperature of water at the surface would be 212° Fahrenheit. *Id.* Then, he analyzed the thermal stress on the walls and floor of the pool, conservatively assuming that the temperature of water at the top of the fuel (23.4 feet deep) might rise to 237° Fahrenheit, to determine whether they would retain integrity. *Id.* at 4. Prelewicz employed a

"computer code, HEATING5" to analyze the temperature which could be expected at different locations within the concrete as time passed. *Id.* at 5.

Mr. Sacramo's affidavit explains that the basis for his analysis of concrete integrity was a technical paper on concrete strength at elevated temperatures. Since the paper reported studies of over 14 different aggregate (concrete) mixtures aged for 28 days each, Mr. Sacramo concludes that the upper and lower bounds established are generally valid for concrete, including the concrete in the Big Rock Point spent fuel pool. Sacramo at 3. Based on that study, the maximum reduction in strength would be 25% at 237° Fahrenheit. *Id.* However, Mr. Sacramo also says that an Oak Ridge National Laboratory study shows that 19 month old concrete that is aged for 14 days at 237° F would increase its compressive strength by about 20% to 30% above the strength of 28 day concrete. *Id.* at 4.

Mr. Sacramo considered the effect of irradiation on concrete. He decided that an Oak Ridge National Laboratory report indicates that at the radiation levels found in the Spent Fuel Pool there would be only slight change in the strength of the concrete. *Id.* at 5.

For conservatism, Mr. Sacramo accepted 80% 28-day compressive strength as the design criterion for the Spent Fuel Pool. He then examined bending moment load-carrying capacities of the reinforcement (or rebar) in the concrete and found only a small reduction would be caused by an increase in temperature from 70° to 237° Fahrenheit. *Id.* at 6-13. He carried out further analysis after which he concluded that the spent fuel pool concrete will withstand the loads resulting from the postulated accident. He also concluded that the spent fuel pool liner and racks were adequately designed. Sacramo at 15, 16.

C. Arguments Against Summary Disposition and Specific Conclusions

In this section of our memorandum, we will discuss the specific factual allegations presented by the intervenors and will determine whether each of the allegations creates a genuine issue of fact that requires that we conduct an evidentiary hearing. We generally will follow this same method of organization throughout the remainder of this memorandum.

1. Reliability of Makeup Water System

Mr. O'Neill and Christa-Maria both question the reliability of the makeup-water system applicant will be required to install. O'Neill complains that the fire protection system is not reliable as a source of makeup water because it depends on offsite power or on diesel generators, which have a history of failure. O'Neill at 2-3. He also complains that the system is "gerry-rigged." *Id.* at 3. Similarly, Christa-Maria complains that the

system was not designed for the purpose of making up water in the spent-fuel pool. Christa-Maria at 7.

Despite the lack of specific documentation for these concerns, they are genuine issues. Although applicant and staff decided that a makeup water system should be employed, neither have described the system in sufficient detail to provide assurance that it will work when called on. To be sure, this is a fourth-level back-up system, but there is agreement that it is needed and some inquiry should be made into its reliability.

There is some cause for concern about the care with which this system has been designed. In particular, applicant describes it as a system that will provide more than 2 gallons per minute of makeup water (Blanchard at 10) and will be diverted automatically from the core spray system (Blanchard 10-11, Figure 2) after high containment water level has been attained. High containment water level may occur within a few days following the initiation of a serious loss of coolant accident. (Blanchard at 10.) We fail to understand why applicant promises only "more than 2 gallons per minute" in its new makeup water system. The NRC staff, on the other hand, states that "a technical specification will be required to provide an 11 gpm makeup capability actuated from outside of containment. . . ." (Paulson at 2; SER at 3-4.) (See NUREG-0404, Vol. I, at 4-23, which states that "To assure the availability of makeup water during an extended outage of the cooling system, there must be a reliable water source and a means of delivering water to the spent fuel storage pools should the need arise.")

2. Long-Term Effects

Mr. O'Neill questions whether the zirconium cladding on the spent fuel rods might be subject to stress corrosion cracking if they are left for an extended period of time in a boiling pool that is not filtered to remove halide ions and other ionic species. He cites NUREG-0404. However, Mr. O'Neill does not provide us with a page citation. With some effort we found the quotation on page H-21 of Volume II. The quotation, found in a section of the NUREG dealing with the evaluation of a long-term Away-From-Reactor storage concept, is:

The corrosion resistance of zirconium is generally very good; however, the presence of halide ions in the water can cause stress corrosion cracking and accelerated uniform corrosion of zirconium alloy cladding. To minimize attack by halide and other ionic species, the storage pool water must be circulated through ion exchange media so the water will be deionized and of a high purity. For this reason, water purification is common practice in storage pools.

Even with respect to long-term storage, this passage should be interpreted together with the subsequent passage, §3.1.4, at H-23, on "Further Study." That passage states that additional study of a variety of corrosion effects from long term storage needs to be undertaken. However, §3.1.4 concludes that "If unexpected long term material problems develop, there will be ample opportunity to take corrective action." Hence, the cited NUREG concludes that even long-term storage could safely be undertaken prior to the completion of further research; and the cited passage does not establish the existence of a genuine issue with respect to expansion of a spent fuel pool on the site of an existing reactor.

Many passages of the cited NUREG deal with the enlargement of spent fuel pools. In that context, the corrosion problem was considered so unimportant that it was not even given as an important reason for requiring a demineralization system, particularly in BWR reactors. Relevant citations, drawn from other portions of the same document cited by Mr. O'Neill, corroborate our conclusion that there is no genuine issue with respect to corrosion of zirconium cladding following a TMI-2 type accident:

The pool is filled with pure, demineralized water (for BWR's) [It] effectively provide[s] the three basic requirements of shielding, cooling, and transparency for fuel handling. Design temperatures are 120-125°F maximum for normal operation and 150°F for abnormal operation. Experience to date shows pools are operating at 100°F or less. Consequently, the fuel is stored in a low temperature, low corrosion environment. The corrosiveness of the neutral [in BWRs] to slightly acidic fluid [in PWRs] is acceptably low for the three major materials used—stainless steel, Zircaloy, and aluminum.

NUREG-0404, Vol. II at B-2.

Spacing of racks for criticality control is not the only major consideration in planning for compact storage at existing plants. Other factors that must be taken into account are maintenance of adequate . . . pool water cleanup capacity.

Id., Vol. I at 3-8.

The only way in which the radionuclides in spent fuel could be made available for dispersal is by physical rupturing of fuel pins However, as corrosion rates of ceramic fuel materials are low, the observable effect might be a slight increase in the Cs[137] content of the pool waters.

Id., Vol. I at 4-15.

The storage of LWR [light water reactor] spent fuels in water pools has an insignificant impact on the environment Primarily this is because the physical form of the material, sin-

tered 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.

Id., Vol. I at 8-2, footnote 4.

These last two citations provide additional support for the conclusion that spent fuel rods would be safe even for a few years following a TMI-2 type accident. Even were the zirconium cladding to suffer stress corrosion cracking, the ceramic fuel contained within the cladding still would release little radioactivity into the pool. Hence, our conclusion stands for redundant reasons.

3. Closure of Containment Isolation Valves

Mr. O'Neill challenges whether containment isolation valves would close as postulated by Mr. Blanchard and by Mr. Paulson in their accident scenarios. He has gone to some length to argue that these valves are not reliable. However, we need not consider those arguments because Mr. O'Neill has not shown how this concern is related to the pending application to enlarge a spent fuel pool. In particular, applicant and staff assume that by the time a boiling problem becomes important the pressure within the containment will be normal atmospheric pressure. Since this assumption, which appears to be the only connection between the closure of the valves and the performance of the pool, is not affected by failure of the valves to close, there is no reason to believe that failure of the valves would affect the performance of the enlarged fuel pool in any way.

4. Class 9 Accident

Mr. O'Neill argues that applicant and staff have not considered whether the enlargement of the spent fuel pool would contribute to the severity of a TMI-2 type accident. However, Mr. O'Neill has not given us a reason to believe that expansion of the fuel pool will exacerbate a loss of coolant accident, other than through the type of loss of control of the pool that we have already discussed. Hence, this argument does not raise a genuine issue of fact. See our Order Following Special Prehearing Conference, LBP-80-4, 11 NRC 117, 125 (1980).

5. Reliability of Spent Fuel Pool Level Monitors

Staff states that applicant must install spent fuel pool monitors that permit the water level to be gauged from outside the containment. Paulson at 2-3. However, as Mr. O'Neill indicates, nothing has been said about the reliability of these newly required monitors and our record does not show

that there is a technical specification that they be installed or that they have been installed. Hence, this is a genuine issue of fact.

6. Gamma Radiation

Mr. O'Neill argues that the Big Rock Plant is insufficiently shielded against gamma radiation and that this defect will prevent timely operation of valves necessary for the makeup system for the spent fuel pool. (O'Neill at 4, citing NUREG 0578 at an unspecified page.) He states, citing Blanchard at 10, that valves VFP-29 and VFP-30 must be opened manually in order to cool the spent fuel pool.

However, Mr. O'Neill misreads Mr. Blanchard. All that page 10 says is that the fire pumps direct water through valves VFP-29 and VFP-30 before injecting it into the reactor vessel in order to cool the core. The statement does not say that these valves need to be operated manually. Furthermore, the only purpose of this portion of the Blanchard discussion is to explain why the core spray cooling system is *not* initially relied on for makeup water. Blanchard at 10. Consequently, Mr. O'Neill's argument does not substantiate a genuine issue of fact because he has not shown how excess gamma radiation—assuming *arguendo* that it may exist—would cause the makeup water system to be unreliable.

7. Effect of Boiling on Containment Components

Christa-Maria indicates that applicant and staff have not analyzed the effects of pool boiling on pipes going into and out of the containment, including welds, flanges and valves. However, the Board is at a loss to understand what is meant. If Christa-Maria really questions the integrity of pipes and fittings going in and out of the containment then it must show some glimmer of a reason concerning why the enlargement of the spent fuel pool could challenge their design basis. There is nothing in our record to indicate that the boiling of the spent fuel pool would challenge the design basis for these parts by adding substantially to other pressures occurring during a LOCA. On the other hand, if Christa-Maria is talking about pipes going in and out of the spent fuel pool, we have no indication that such pipes or drains exist. *See* NUREG-0404, Vol. 2 at B-16 (ordinarily all piping connections and penetrations are near the top of the pool). In conclusion, whatever was meant does not amount to a genuine issue of fact.

8. Motor-Operated Valves

Christa-Maria notes that Mr. Blanchard stated, at p. 10 of his affidavit, that motor-operated valves MO-7064 or 7068 must open for containment sprays to operate during a LOCA. Christa-Maria also notes that these

valves have not been shown to be qualified for high temperature and high humidity environments and might not operate. Christa-Maria at 7.

Since staff relies in part on the operation of the containment spray system to control containment overpressurization (Paulson at 3), Christa-Maria's assertion creates a genuine issue of fact.

9. Reaction of Zircaloy Cladding With Steam

Christa-Maria argues that steam reacts with Zircaloy cladding but that neither applicant nor staff have considered this fact. It cites as one of its authorities Consumers Power Company, *Probabilistic Risk Assessment: Big Rock Point Plant*, at 103, which states: Once the water level drops below the top of the active fuel assembly, the fuel rods will become overheated, helped to some extent by the exothermic steam/Zircaloy oxidation process.

See also Statement of Dr. Michio Kaku, passim (possibility of zirconium-water reactions, zirconium fires and hydrogen explosions); Allen S. Benjamin and David J. McCloskey, "Spent Fuel Heatup Following Loss of Water During Storage," 49 *Nuclear Technology* 274-294 (July 1980) (supporting Dr. Kaku's views and cited in Dr. Huver's affidavit); H. Karwat, "On Possible Interactions of Vapor-Radiolysis with the Oxidation of Zirconium by Steam", 2 *Proceedings of the Workshop on the Impact of Hydrogen on Water Reactor Safety* 69, 73 (NUREG/CR-2017; SAND81-0661; 1981) (questioning whether radiolysis of superheated vapor would considerably lower the temperature necessary for an exothermic zirconium reaction).

We find that Christa-Maria is correct in believing that this is a genuine issue of fact. Although applicant and staff have calculated boil-off rates for the spent fuel pool, they have not included any discussion or calculation of the extent to which heat from a Zircaloy/steam reaction would contribute to the process. Compare Blanchard at 6, 8. (If the water level drops below the top of the fuel rods, cladding failure may occur; but Blanchard's boil-off equations do not include any heat term for the Zircaloy/steam reaction.)

Of course, applicant and staff may satisfy us that this problem is not serious because the water level will not fall below the top of the fuel rods. If makeup water systems are shown to be sufficiently reliable, therefore, applicant may discharge its burden of proof on this issue as well.

10. TMI-2 Lessons Learned

Christa-Maria complains that applicant has not yet complied with regulations passed by the Commission as a result of lessons that were learned from studying the accident at TMI-2. Although Christa-Maria is correct in its assessment of the importance of complying with those

regulations, this question is not within our jurisdiction unless it can be related to the pending licensing application, dealing with enlargement of a spent fuel pool. Since no attempt has been made to show us that nexus or relationship, we are not authorized to assist Christa-Maria with this concern. Instead, we must rely on the diligence of staff in assuring compliance with these important regulatory requirements.

11. Seismic Loading Conditions

Christa-Maria has moved separately for the admission of a late contention regarding seismic loading. It also attempts to present this argument as relevant to this contention. It states that, "Licensee admits that several pool components have not been analyzed in relation to seismic loading conditions" Christa-Maria at 9.

We do not consider this to be a permissible argument under the admitted contention, which does not refer to a condition precipitated by an earthquake. The change that an earthquake would occur during a TMI-2 type event is sufficiently remote that there is insufficient nexus to raise this argument under the rubric of this contention.

12. Concrete Strength

In its January 26 filing, Christa-Maria raised three questions concerning Mr. Sacramento's calculations of concrete strength. It argued that boiling temperatures at the pool bottom could reach 247° Fahrenheit (rather than 237° F, Sacramento at 3), that the assumption that the fuel was all loaded at one point in the center of the fuel pool floor is not sufficiently conservative because other assumptions might more heavily irradiate the pool walls (compare Sacramento at 4) and that Mr. Sacramento incorrectly assumed uniform loading of the pool floor when, in fact, the racks rest on legs and would cause point loading. Sacramento at 11.

We find that there are genuine issues of fact concerning the resistance of concrete to 247° water and concerning the integrity of the pool when subject to point loading from the storage racks. However, we find that the strength of irradiated concrete was appropriately analyzed and that there is no genuine issue of fact about that issue. By assuming concentration of all radiation at a single point, Mr. Sacramento analyzed the effect on a single portion of the concrete from a very high radiation exposure. Since that one portion of concrete was found to be safe from the high exposure, other portions would be safe if the radiation were assumed to be spread out.

D. Admitted Issues

The following issues have been admitted as genuine issues of fact with respect to this contention:

(1) How reliable is the remotely activated makeup water system which will be added to the spent fuel pool. How reliable does it need to be? How many gallons per minute will it be able to makeup?

(2) How reliable are the spent fuel pool water level monitors which applicant is planning to install? Is applicant required to install and maintain these monitors?

(3) Are motor operated valves MO-7064 and 7068 necessary to control containment pressurization? Are they qualified for high temperature and high humidity?

(4) Will Zircaloy react with steam in a fuel pool which is boiling because its cooling system has failed? Will the reaction become self-sustaining?

(5) Is the concrete in the fuel pool strong enough to resist a temperature of 247° F and point loading from the storage racks?

III. O'NEILL CONTENTION II.F.

A. The Contention

This contention states that:

Because of the expansion of the spent fuel pool, routine releases and accidental releases similar to those that have already occurred, of effluents, will no longer meet the guidelines of Appendix I, Sections II and IV of 10 CFR Part 50 because, in violation of Appendix I, Section IIIA.1, the required calculations do not estimate bioaccumulation factors in a manner appropriate to this site.

To understand this contention better, it should be divided into its elements. First, the contention states that the expansion of the spent fuel pool will cause Big Rock Point to violate the regulations regarding the release of radioactivity. Second, the contention states that the reason for the expected violation of the regulations is that applicant does not correctly calculate "bio-accumulation factors", i.e. that applicant underestimates the extent to which its radioactive releases will accumulate in living things.

For a genuine issue to exist, both elements of this contention must be supported by facts. If the first element, relating to cause, does not exist, then the contention fails because there is no relationship between Mr. O'Neills fears about radioactivity and the pending application. We lack jurisdiction unless there is a nexus. Hence, Mr. O'Neill would need to seek other remedies outside this proceeding unless there is a nexus.

The second element also is necessary to this contention because it contains Mr. O'Neill's theory concerning the reason that the radioactive release rules will be violated.

In this portion of the memorandum, we shall discuss these elements of the contention separately, in order to facilitate understanding of the grounds for our decision.

B. Arguments for Summary Disposition for Lack of Nexus

Staff and Applicant contend that the expansion of the fuel storage pool will not add materially to the hazard from discharge of radioactive effluents through either routine or accidental releases.

J.S. Boegli, a chemical and nuclear engineer employed by the Commission, stated in an affidavit:

The expansion of the fuel storage capacity in the spent fuel pool at Big Rock Point Plant will not increase the volume or substantially increase the amount or type of radioactive materials in the pool water.

Boegli at 1. *See also* Staff Statement of Material Facts as to Which there is No Genuine Issue, #67; Environmental Impact Appraisal (May 15, 1981) (EIA) at 4-7. (Even the leakage of fission products from fuel rods that produced significant leakage within the reactor diminishes greatly after fuel is removed from the reactor and cooled by being stored in a spent fuel pool. Furthermore, the only additional airborne release that might result from expansion of the pool would be up to 5 curies per year of Krypton-85, resulting in an additional total body dose of less than .0001 mrem/year at the site boundary.)

Somewhat differing testimony was offered by Roger William Sinderman, a health physicist employed by Consumers Power Company. Mr. Sinderman concedes that:

Operation of the spent fuel pool with additional stored spent fuel may introduce slightly greater quantities of radioactive material into the pool, but not different types of radioactive material.

Sinderman at 4. However, Mr. Sinderman also explains in detail his reasons for believing that additional releases would not occur. In discussing atmospheric releases, Mr. Sinderman states:

[B]ecause the amount of spent fuel which may be discharged from the reactor to the spent fuel pool during each refueling will not be increased due to the proposed license amendments, expansion of the storage capacity of the pool permits only the longer term storage of more highly decayed spent fuel and not the introduction of greater quantities of freshly irradiated fuel. Most gaseous radionuclides in spent fuel have short half-lives. Krypton 85 is the only gaseous radionuclide remaining in spent fuel having decayed for a year or more. Therefore, Krypton 85 is the only gaseous radionuclide which could potentially be released in in-

creased quantities to the containment atmosphere, due to the proposed license amendments.

In general, Krypton 85 is contained within the cladding of spent fuel. Although some spent fuel elements have pinhole leaks through which Krypton 85 can escape, there is no significant release of Krypton 85 even from such "leakers" after the spent fuel has cooled for 4 to 6 months. Moreover, the amount of Krypton 85 present in spent fuel is so small that even an instantaneous release from the plant of all the Krypton 85 in the expanded spent fuel storage pool when it is filled to capacity could not result in violation of Appendix I dose limits. Such instantaneous release is postulated for illustration purposes only. It is not a credible scenario.

Sinderman at 5-6 [paragraphing added and footnotes deleted].

Dr. Charles W. Huver disputes Mr. Sinderman's testimony about gaseous releases, making it necessary for us to consult Sinderman Ex. 3 for further detail supporting the Sinderman testimony. Page 1 of that exhibit has a table showing that the maximum curies of Krypton-85 available in the fuel pool is $2.64E+05$, compared to a design objective of $1.74E+06$. Similarly, the quantity of Iodine-129 in the fuel pool is shown to be less than the design objective. Nevertheless, despite this detailed calculation by Mr. Sinderman, Dr. Huver makes no attempt to calculate the amount of Kr in the fuel pool. He merely states that a 1000 MW(e) reactor would accumulate 1.12×10^6 Ci and he does not explain why that calculation is contradictory to Mr. Sinderman's calculation. Consequently, there is no genuine issue of fact concerning the magnitude of a hypothetical instant release of all the krypton in inventory and, given the great improbability of such an instant release, there is no reason to believe that krypton in the fuel pool would endanger public health. Since Dr. Huver also does not question the Iodine-129 calculation, there is no genuine issue of fact as to it.

Similarly, in discussing the discharge of liquid radioactive effluents, Mr. Sinderman states:

At the beginning of each refueling outage when freshly irradiated fuel from the reactor core is introduced to the spent fuel pool, somewhat higher levels of radioactive materials appear in the pool water. *The spent fuel pool water is continually recycled through a filter to remove these radioactive materials. Within several weeks of the introduction of freshly irradiated fuel into the pool, levels of radioactive materials return to their normal low level in the pool water.* Again, because the pool in its expanded storage state only permits the storage of increased amounts of older more highly decayed fuel, little if any additional radioactive material is re-

leased to the pool compared to the release from the freshly irradiated fuel. Hence there will be little if any increase in liquid releases to Lake Michigan from the spent fuel pool due to the proposed license amendments.

[Emphasis added.] *Id.* at 9. We note that Mr. Sinderman did not say that old fuel elements would not continue to generate or leak radiation products, as will occur. Mr. Sinderman relies on the continuous recycling of the water through a filtering system to remove the radioactive salts from the pool. Nothing in intervenor's affidavits contradicts his conclusion that "levels of radioactive materials [would] return to their normal low level. . . ." (Although the filtering system would not remove dissolved tritium, which might increase with the addition of some primary water accompanying a fresh core which is unloaded into the pool, the amount of tritium would be expected to be very small and intervenors have not provided a reason to believe that the accumulation of this one product would cause a substantial increase in radioactivity in the pool or the environment.)

In addition, we are persuaded by Mr. Sinderman that all spent fuel pool waste liquids are processed in the liquid radwaste system before they are either reused or are measured and subsequently discharged into Lake Michigan. Hence, as Mr. Sinderman says, "no release of radioactive liquids from the expanded spent fuel pool can exceed limits without detection." Sinderman at 8-9.

The only credible pathway suggested to us for release of waste from the pool is if the pool were to attain supercriticality. Huver at 3-4. Surely, if that event were to occur, there would be an increased environmental hazard from the release of radioactivity. However, under our usual practice such an occurrence would be dealt with as an important safety issue. We shall treat it that way here. We shall require that applicant take all necessary steps to prevent supercriticality from being a realistic possibility. Consequently, supercriticality will not be considered by us as a mechanism for release of radioactivity.

C. Arguments Against Summary Disposition For Lack of Nexus

Neither Christa-Maria nor Mr. O'Neill have shown that there is a genuine issue of fact concerning applicant's statement that there will be very little increased risk of radioactive release from expansion of the spent fuel pool. Consequently, on the basis of Mr. Sinderman's testimony, the Board accepts Staff's suggested finding #67, cited above, and concludes that there is no genuine issue concerning the relationship between the expansion of the spent fuel pool and the release of substantially increased quantities of radionuclides. Hence, summary disposition of this contention is granted.

D. Adequacy of Bioaccumulation Factors and Radiation Monitors

We have already determined that this contention should be dismissed for lack of nexus to this proceeding. Nevertheless, government never is a pure adversary of any citizen. Even in the seemingly adversary arena of Commission proceedings, intervenors should receive from their government an adequate response to their concerns, regardless of whether those concerns are properly part of a licensing proceeding.

In this proceeding, Christa-Maria expresses concern about certain portions of a Health Physics Appraisal (Appraisal) which was completed by the Commission's staff and transmitted to Consumers Power Company on June 13, 1980. In ¶ 11 b. of that Appraisal, at 33-34, the staff noted several problems with the airborne effluent monitoring system in use at Big Rock Point. Although these problems are not related to the expansion of the spent fuel pool, because of the limited potential impact of the expansion on the amount of airborne effluents, it would be helpful if intervenors were appraised of further developments relating to this concern.

In addition, both Christa-Maria and Mr. O'Neill have raised questions about the way applicant calculates bioaccumulation factors and determines the accumulation of radioactivity in fish. Affidavit of Charles W. Huver, Ph. D.; Affidavit of Eunice J. Hendrix; and Affidavit (with attachment) of Bernd Franke. Because there is no nexus between this contention and the enlargement of the spent fuel pool, it should not be formally heard in this proceeding. It could be embodied in a rulemaking petition under 10 CFR §2.802; however, a brief discussion of the issue is appropriate.

As Mr. Sinderman stated, applicant performed bioaccumulation studies in 1972 and 1973. Sinderman at 10. These studies estimated bioaccumulation factors, which are the ratio of radioactivity in fish to the radioactivity of surrounding water. This study helps to provide a method of determining how much radioactivity fish might be expected to absorb should there be a serious release from the plant. Sinderman at 10-11; disputed by Huver, Franke, and Hendrix throughout their respective affidavits. Two hundred fish at 19 locations were sampled. Sinderman at 12. The results were reported in Table V. Sinderman at 14. (Table V reports a *ratio*; it does not show amounts of radioactive accumulation. Compare Christa-Maria at 20.) It is a guide to which radioactive isotopes might be found in fish were there substantial radioactive releases.

Assurance concerning the effect of Big Rock's operation on the environment is derived from periodic sampling, whose method has been called into question by the intervenors. Sinderman at 14-15; challenged by Huver and by Franke. Five locations, one of which is at the mouth of the plant discharge canal and two of which are only $\frac{1}{4}$ of a mile away, are used in the sample. (Meeting Mr. O'Neill's concerns about bioaccumulation stud-

ies taken one mile from the plant in the baseline study.) Measurements are then taken of the concentration of radioactive materials in the sampled organisms. These results, which were not included in Mr. Sinderman's affidavit, are said to be "consistent with" regulatory guidelines. Sinderman at 15.

Given the extent of intervenors' interest in this subject, the applicant and staff might share the actual measurements of radioactivity in fish with the intervenors. Although the intervenors' approach to the measurement of radioactivity might lead them to interpret the data differently from the Commission, it would seem that this data ought to be available, thus permitting members of the public to reach their own conclusions about the effects of Big Rock Point on local fish. To the extent that this data and the Commission's interpretation of it still may not satisfy intervenors, the appropriate remedy for their concern would be through a petition for rulemaking rather than as a part of this proceeding.

IV. CHRISTA-MARIA CONTENTION 2 AND O'NEILL CONTENTION II.A.

A. The Contentions

Christa-Maria contention 2 states that:

The increase in fuel stored in the Big Rock pool will result in an increase in the amount of radiation released to the environment at the south wall of the storage pool where there is less shielding, according to the licensee's Description and Safety Analysis. This increment in the level of radiation released to the environment enhances the risks to the health and safety of the public in the vicinity of the plant.

O'Neill contention II.A. states that:

The routine releases of radioactivity during the installation of new racks, the loading of those racks, and storage of fuel in the racks will exceed the exposure of workers, as will the releases of radioactivity through the south wall of the pool exceed the limits imposed by Appendix I to CFR Part 50 on exposure to the general public.

The Christa-Maria contention relates entirely to a concern about radiation risks to the general public. Mr. O'Neill is concerned both about exposures of workers and of the general public. In view of their nature, Mr. O'Neill's arguments about the exposure of workers to radiation risks during the installation of the new racks will be addressed separately.

B. Arguments for Summary Disposition Concerning Continuing Effects

This portion of the memorandum addresses the portion of this contention that relates to the effects of radiation subsequent to the installation of the new racks.

Applicant states that the outer three rows of the spent fuel pool, next to the south wall, which ranges in thickness from 5'9" to 3'6", will be used to store only fuel that has aged more than one year in the spent fuel pool. Applicant at 1, 3. It also states that the rack closest to the thinnest portion of the south wall is a "channel rack" designed to hold a round support tube but unable to hold a square spent fuel bundle. Axtell (a career health physicist whom we accept as an expert) at 7-8. Hence, the dose rates outside the south wall will be approximately 2 to 2.5 mrem/hr. Axtell at 8-9, 20. In addition, for the protection of workers the area immediately outside the pool (containing the filter sock tank, which already emits about 30 to 40 mrem/hr) is radiologically controlled and infrequently entered. Applicant at 3-4. The resulting exposure to workers could not, therefore, exceed Part 20 limits. Applicant at 4; Axtell at 9-11, 17-20. Applicant also states that restricting the outer three rows of available storage to one-year-old fuel complies with the requirement that radiation be kept to a level as low as is reasonably achievable (ALARA). Sinderman at 5.

Staff's analysis differs from applicant's in several respects. First, it differs concerning the dimensions of the south wall of the spent fuel pool, which staff says ranges in thickness from 6' to 3'. Donohew ¶7 at 2. Furthermore, staff says that applicant has estimated that the radiation level outside the relatively thinner region of the south pool is 38 mrem/hr., apparently accepting a calculation (Bell at 4) which applicant says is hypothetical and exceeds the actual amount of radiation release because new fuel could not be placed along the thinnest part of the pool wall. Donohew ¶8 at 2; Sinderman at 1-2. From this estimate, which greatly exceeds the expected radiation, staff then concluded that radiation through the thin part of the pool wall would not exceed limits set in 10 CFR Part 20. Donohew ¶14 at 3-4.

C. Analysis of Arguments Against Summary Disposition Concerning Continuing Effects

Christa-Maria contends that applicant and staff disagree about the dimensions of the south wall of the spent fuel pool. In addition to the apparent discrepancy, set forth above, between the minimum thickness (3'6" vs. 3') values and the maximum thickness (5'9" vs. 6') values, Christa-Maria indicates that Mr. Axtell stated that there was a portion of the south wall that is only 2' thick. Axtell, footnote 2 at 4. However, we

have reviewed that portion of the Axtell affidavit and conclude that the section of wall there described is so far above the top of the stored fuel as to have no significance whatever.

We find that the discrepancy about wall dimensions is a genuine issue of fact and is important enough to explore further. We are interested both in the source of the discrepancy and its possible effects on the calculation of radiation levels. Intervenors also should be informed, pursuant to their request, of the point along the south wall used as a reference point for calculating dose estimates. Christa-Maria at 23.

We also find that staff has not informed us whether it has reviewed applicant's most recent estimates of the amount of radiation coming from the pool at the thinnest part of the south wall. Hence, the public is deprived of the staff's assurance that applicant is correct in its 2.5 mrem estimate and that undue health effects will not ensue. Similarly, the Board finds it difficult to complete an adequate review of Christa-Maria's claim that the combined radiation from the pool and sock tank, both located in the same area, will amount to 68-78 mrem/hr., which Christa-Maria describes as inordinately high. There are, therefore, genuine issues concerning radiation levels near the south wall at its thinnest point.

In addition, applicant has in the past managed to reduce radiation above the spent fuel pool from a range of 14 to 24 mrem/hr. to a range of 8 to 15 mrem/hr over a 7 month period (from 12/12/79 to 7/17/80). This was achieved through increased use of the radwaste demineralizer. August 11, 1980 letter-of David P. Hoffman of Consumers Power Co. attached to Axtell affidavit. Even the last level, averaging about 11 mrem/hr., concerns Mr. O'Neill. O'Neill at 1. However, applicant has not agreed to use the radwaste demineralizer with any minimum frequency or to meet any radiation objectives for the pool. This raises a genuine issue of whether radiation from the pool is ALARA.

There also is a genuine issue of fact concerning the possible existence of a radiation hazard to the public from radiation emanating from the pool. Although we believe that the radiation levels at the site boundary are unlikely to cause an undue hazard to the public health and safety, there is as yet no adequate proof of safety in our record. The existing proof of applicant and staff is too imprecise for us to accept.

Mr. Sinderman, for example, gives us the formula he used to calculate the level of radiation at the site boundary (Sinderman at 3) and tells us that the quantities μ_a and μ_c used in the formula are "mass absorption coefficients." (Bordine at 4.) In the formula itself these quantities are multiplied by distances, thus suggesting that they are *linear* absorption coefficients. We are unable to tell whether this is just an editorial problem, as we do not have a copy of the 1981 edition of Hine and Brownell and our library tells us that it does not know of that particular edition.

As for the Staff's analysis, Dr. Donohew tells us he made the same extrapolation by assuming a point source and using the inverse square law. Donohew at 3. He implies that some attenuation was allowed but does not say how this was done, nor does he tell us where the point source was assumed to be located or the reference level to which the inverse square law was applied. We infer that the reference level could not be the 38 mrem/hr. mentioned (Donohew at 2), because at that position the source does not approximate a point source (cf. Bordine at 3-4). Since the results of their calculations differ by more than a factor of two (Bordine at 4, Donohew at 3) we need a resolution of the differences and some assurance that neither is off by orders of magnitude.

D. Conclusions Concerning Safety of Workers

After reviewing the summary disposition motions and intervenors' statements, we are left with serious concerns about the safety of workers during the installation of new spent fuel storage racks.

As Mr. O'Neill (O'Neill at 2) points out, temporary workers apparently will be used for the reorganization of the spent fuel pool pursuant to the requested license amendment. However, applicant has not disclosed any part of its plans for hiring, training and supervising these workers. Hence, there is a genuine issue concerning whether applicant's plans to comply with ALARA will be achieved or whether field implementation will fall far short of existing plans.

Similarly, Mr. O'Neill cites extensively from a report of the Institute of Nuclear Power Operations, "Evaluation of the Big Rock Point Nuclear Power Plant," August 1981 (INPO Report). This report finds:

No structured, comprehensive initial training program is available for chemistry and radiation protection technicians. Also, no continuing training program is in use by which senior chemistry and radiation protection technicians can maintain and improve their job performance. Some technicians have received little training other than on-the-job training. *Observations of work activities and discussions with personnel indicate that basic training is needed.*

Id. at 24 [emphasis added].

A number of examples were noted where workers are not rigorously complying with procedures and generally accepted good practices regarding contamination control. The poor practices observed have resulted in the *spread of contamination to clean areas and in personnel contamination.*

Id. at 26 [emphasis added by Mr. O'Neill at 2].

No comprehensive ALARA program exists.

Id. at 25.

[O]bservation of a radwaste shipping operation involving significant exposure rates (3-4 R/hr) revealed that *although more than usual planning was conducted, personnel exposures could have been further reduced* by some relatively simple changes in the way the work was performed.

[Emphasis added.] *Ibid.*

Under these circumstances, there is a genuine issue concerning the adequacy of applicant's entire ALARA program and, more particularly, steps it may have taken in response to the INPO report. In this context, we also note that applicant's Director of Radiological Services, Mr. Roger W. Sinderman, filed an affidavit concerning the effects of fuel pool radiation on the public. However, he did not even mention the effect of the reracking program on workers. Hence, we do not have the benefit of his opinion concerning the achievement of ALARA objectives. Given Mr. O'Neill's serious allegations, based on the INPO report, it would seem appropriate for the Director of Radiological Services to provide his opinion on the adequacy of the ALARA program for the protection of workers.

In a less important vein, applicant has not indicated the extent to which the radwaste demineralizer will be used to reduce radiation levels in the spent fuel pool prior to and during the reracking procedure. Hence, it is not possible to know whether ALARA conditions have been met with respect to radiation from the surface of the pool. This also is a genuine issue of fact.

E. Overall Conclusion

The Board finds that this contention raises each of the following genuine issues of fact:

(1) What caused the discrepancy between staff and applicant statements about the relevant dimensions of the south wall of the spent fuel pool and what effect, if any, has this discrepancy had on radiation calculations?

(2) What is the combined radiation from the pool and filter sock tank?

(3) What point on the south wall was used as a reference point for calculating dose estimates?

(4) What is the reason that applicant stated that it used "mass absorption coefficients" in radiation estimates when it apparently used linear absorption coefficients?

(5) What was the location and reference level to which staff applied the inverse square rule to calculate off-site doses?

(6) What hiring, training and supervision methods and what health physics safeguards will be used during the installation of the new fuel rack?

(7) What has applicant done to correct alleged health physics deficiencies identified by the Institute of Nuclear Power Operations in its August 1981 report?

(8) To what extent will the radwaste demineralizer be employed on a continuing basis to attenuate radiation from the spent fuel pool?

V. O'NEILL CONTENTION II.B.

This contention states that:

The Licensee's plan is deficient in failing to discuss the environmental hazards associated with small to medium leaks of radioactive water from the expanded spent fuel pool.

We have concluded that summary disposition of this contention should be granted. Staff asserts that there will be only a small increase in radioactivity to be released to the pool water as a result of the proposed modification. Donohew, Jr. Affidavit at ¶7, p. 2. Since intervenors have not challenged that assertion by showing that there is a genuine issue concerning increased risk, there is no nexus of the contention to this proceeding and we lack jurisdiction. Hence, we find that there is no genuine factual issue to set for hearing. See III.C. of this memorandum for a fuller explanation.

We note also that applicant and staff have gone to great lengths in their motions to discuss a wide variety of leak scenarios and to attempt to assure intervenors of the safety of the system. In its materials, applicant has indicated, for example, that it previously safely operated its spent fuel pool without any liner and that the installation of a stainless steel liner further improves the integrity of the pool. Bordine at 2. Applicant and staff also review how water dripping from leaks would be collected and treated and they indicate that anti-siphon precautions have been taken to prevent lines going into the pool from unintentionally draining the pool. Bordine at 4, 5-8. Furthermore, staff says the licensee will install a remote indication of pool water level to help to detect leaks without visual inspection. Donohew at 2.

In addition to the failure to relate safety allegations to the expansion of the spent fuel pool, there is no genuine issue of fact with respect to safety problems raised by intervenors.

VI. CHRISTA-MARIA CONTENTION 3 AND O'NEILL CONTENTION I.B.5

A. The Contention

The Christa-Maria contention states that:

The use of type 304 austenitic stainless steel in the new spent fuel storage racks could lead to corrosion cracking in the pool environment, with a resultant risk to the integrity of the racks and the continued safe storage of the fuel. J.R. Weeks in his July 1977 report on "Corrosion of Materials in Spent Fuel Storage Pools" has indicated that "[s]tress corrosion of stainless steel components or zircaloy cladding cannot be entirely ruled out because of the lack of understanding of the stress states and the degree of sensitization of stainless steel". (p. 10).

The related O'Neill contention reads:

The corrosion and degradation of the materials of construction of the pool, pool liner, fuel elements, and racks (for example, concrete, stainless steel and aluminum) will be accelerated by the stresses caused by expansion and, as a result, the pool and racks will not retain their integrity through the remaining term of the operating license.

We note that these issues are related to the issue discussed above in paragraph II.C. 2. of this memorandum.

B. Arguments for Summary Disposition

Staff relies on the affidavit of Dr. John R. Weeks, Senior Metallurgist and Leader of the Corrosion Science Group of the Brookhaven National Laboratory. Dr. Weeks also is the individual cited as an authority in the Christa-Maria contention. Dr. Weeks commented on the potential for corrosion of each of the potentially susceptible materials in the fuel pool, including Type 304 stainless steel, S-21800 stainless steel, aluminum, Zircaloy and Inconel. Weeks at ¶6, pp. 2-3. He states that:

In general, I do not anticipate any significant corrosion problems to develop on the materials used in the Big Rock Point Spent Fuel Storage Pool as long as the water quality is maintained to the purity stated by the licensee. The estimated spent fuel pool temperature under the increased heat load is still within the design value of 95°F, and consequently, I anticipate no effects of temperature on degradation of the structural materials and spent fuel cladding, nor would I anticipate any significant effects should the temperature rise to the boiling point of water for brief periods (up

to several weeks duration). The utility has stated that the fuel pool water chemistry is maintained at a pH of 6.9 and a conductivity typically of 0.3 $\mu\text{mho/cm}$. These values indicate extremely pure, neutral water, in which environment stress corrosion cracking and crevice corrosion or other localized corrosion processes are extremely rare.

Id. at 3-4.

Type 304 stainless steel has been used in the spent fuel storage racks in a number of locations around the country, and to the best of my knowledge no stress corrosion cracking or other degradation of these racks has yet developed during spent fuel storage To the best of my knowledge there has been no evidence of deterioration of these [stainless steel] liners by stress corrosion cracking over that [greater than 12 year] period [N]o defects have developed in Zircaloy cladding to date as a result of conditions in pool storage anywhere in the U.S. or abroad to the best of my knowledge. Consequently, massive degradation of the Zircaloy cladding such as would be required to increase significantly the release of fission products to the environment is highly unlikely in the Big Rock Point Spent Fuel Pool.

Id. at 4. For similar reasons, Dr. Weeks approves of the anticorrosive qualities of S21800 stainless steel. *Ibid.*

Dr. Weeks also directly addressed Mr. O'Neill's Contention IB-5 in the following passage:

The [SER] . . . states in Section 3.4.1.1 that stress analyses have demonstrated that, even under (highly unlikely) severe boiling conditions, the stresses on the racks, liner, and concrete are within design allowable limits. These limits are well below the yield strength of metals or the fracture strength of concrete. Under these conditions, experience has shown that corrosion and degradation of concrete, stainless steel and aluminum will not be accelerated. Therefore, I do not believe that the stresses caused by the expansion will have a significant effect on the likelihood that degradation processes such as mechanical failure or stress corrosion cracking will occur in the Big Rock Point Spent Fuel Pool.

Ibid. at 4.

In addition, licensee submits an affidavit of A. John Birkle, a metallurgical engineer who is Section Head of its Materials Section. Mr. Birkle's testimony corroborates many aspects of the testimony of Dr. Weeks.

C. Arguments Against Summary Disposition, and Specific Conclusions

Christa-Maria has not submitted any expert testimony of its own concerning this contention and it has not cited any independent authorities. It relies on logical arguments concerning the inadequacy of the arguments presented by applicant and staff.

First, Christa-Maria takes issue with opposing experts' conclusions that corrosion rates at the design temperature of 95°F are not significant. It relies on a portion of the SER, quoted out of context. The in-context citation to the SER follows:

The pool liner, rack lattice structure and fuel storage tubes are stainless steels which are compatible with the storage pool environment. In this environment of oxygen saturated demineralized neutral (pH of 6.9) water, the corrosion rate of the stainless steel is so small as to be unmeasurable. *Corrosion rate measurements for this material in water of this quality and temperature are not available, and any estimate of corrosion rates must be extrapolated down from measurements at higher temperature.* Calculated corrosion degradation, using extrapolated estimated rates, of type 304 stainless steel would not exceed a depth of 6.00×10^{-5} inch in 100 years, which is negligible relative to the initial thickness.

[The portion cited by Christa-Maria is emphasized; footnotes deleted.]
SER at 3-10.

In this portion of the SER, staff stated that "measurements" were not available at this water temperature. However, staff presented an extrapolation, based on a footnoted study by Dr. Weeks, in which staff obviously has great confidence. Christa-Maria has not questioned the extrapolation technique. It also has not provided any logical or factual challenge to the conclusions contained in Dr. Week's affidavit in support of summary disposition. Nor has it indicated why the substantial operational experience with spent fuel pools does not provide adequate assurance of the safe operation of the pools in normal operation. Consequently, Christa-Maria has not demonstrated the existence of a genuine issue of fact with respect to normal pool operation.

Christa-Maria expresses concern about the corrosion resistance of 304 stainless steel and Zircaloy under more extreme temperatures that might arise during temporary or long-lasting excursions. It also suggests that the racks should be made of "316 K.", which it says is more corrosive resistant and is being used by General Electric in recirculation piping loops in plants now under construction. Supplemental Memorandum in Opposition, January 26, 1982, at 1.

However, ¶8 of Dr. Week's affidavit (Weeks at 4) addressed the question of corrosion resistance directly. In that paragraph, which we cited

above, Dr. Weeks supported Staff's conclusion in the SER that stresses on essential pool components are within design limits. Based on that predicate, Dr. Weeks concluded that even severe boiling conditions would not accelerate corrosion and degradation. He also stated, on the previous page of the affidavit, in a passage cited above, that up to several weeks of boiling would not degrade the Zircaloy cladding; and he concluded that "massive degradation of the Zircaloy cladding such as would be required to increase significantly the release of fission products to the environment is highly unlikely in the Big Rock Point Spent Fuel Pool." Weeks at 4. *See also* NUREG-0404, Vol. I at 4-15 (even after the cladding is ruptured significant quantities of radionuclides would not be dispersed because the ceramic fuel materials inside the cladding are resistant to corrosion).

For these reasons, we conclude that Christa-Maria has not demonstrated the existence of a genuine issue of fact with respect to this contention. (Mr. O'Neill has not filed opposing arguments.) Nevertheless, we shall require applicant to file with us a clarifying affidavit. The need for this affidavit arises because of an ambiguity in our record, stemming from the testimony of Mr. Birkle. In his affidavit, at 3, he stated that stainless steel can be "sensitized" to corrosion due to cold work and welding; he stated that there are techniques to minimize the sensitization. We infer that these techniques will be employed in the manufacture of the spent fuel rack; however, we have failed to find any portion of the record stating that those techniques will be employed in the manufacture of this rack. Providing that applicant submits a satisfactory affidavit certifying that these techniques will be employed and that the quality assurance program will ascertain that the techniques have in fact been employed, then we will conclude that there is no remaining genuine issue with respect to this contention. Consequently, unless we determine otherwise by future Order, the motion for summary disposition of this contention is granted and the contention is dismissed.

VII. O'NEILL CONTENTION II.D.

A. The Contention

O'Neill contention II.D. states:

The licensee has not adequately provided for the protection of the public against the increased release of radioactivity from the expanded fuel pool as a result of the breach of containment due to the crash of a B-52 bomber.

B. Conclusions

The principal question that arises with respect to this summary judgment motion is the effect to be given to a deposition of Major Gary Betourne and Mr. Clayton Thomas on July 13, 1981 (Deposition) and to a risk analysis completed by them on January 2, 1980 (Analysis).

This contention calls into question the safety of Big Rock Point from accidents caused by B-52 and (by implication) FB-111 bombers flying at altitudes as low as 200 to 400 feet along the Strategic Air Command's (SAC) Bayshore training route that passes less than 12 miles from the plant. The planes flying the route are based up to 2000 miles away. The crews are qualified pilots and navigators (or training crews traveling with instructive personnel) who come to the route to train in precision, low-altitude navigation, followed by a practice simulation bombing run against simulated targets. While practicing, they carry neither live nor dummy bombs. They traverse the entire 50 mile segment near the plant in about 6 or 7 minutes. Whenever they deviate 4 nautical miles from the center of their route, their mission is aborted and they are directed to climb up out of the flight path, away from the nuclear plant. Deposition at 23, 29-30, 41, 63, 72. The analysis found that the risk of accident to Big Rock Point was less than one in a hundred million. Deposition 84-85. Subsequently, SAC moved the Bayshore route, which was 5.7 nautical miles from Big Rock Point at the time of the analysis, to a minimum distance of 11.5 miles away, which is its current distance; and Maj. Betourne testified that this might reduce the probability of overflight by a factor of roughly 10. Deposition at 98-101.

The validity of the Analysis is not beyond genuine dispute, for each of the following reasons:

(1) A Bayshore plane overflew the plant on July 5, 1979. We infer that the error that occurred resulted from the use of the Big Rock Plant as a navigational offset or reference point. Deposition at 56-57, 101-102. The error apparently was failure to remember that the Plant was being used as a reference point and that navigation was not in "direct mode", causing the plane to fly directly over the plant instead of 5.7 miles away. Deposition at 57. Consequently, SAC has prohibited further use of the plant as an offset. However, the plant is an obvious, visible landmark and no effort has been made to verify compliance with the offset prohibition rule.

(2) There was an actual crash of a B-52 in 1971 near the plant. Deposition at 47. (Contrary to intervenor's suggestion, there was only one crash on the Bayshore route. Deposition at 46-48.) Major Betourne did not include pre-1971 crash data because of dissimilarities in aircraft and

training practices. We accept that decision; however, Major Betourne did not have a sufficiently thorough knowledge of the 1971 crash to discern its possible implications for his risk analysis. Deposition at 48.

(3) The sample was inadequate. It apparently consisted of 10 gross navigational errors occurring during a two month period. Deposition at 52. These 10 errors apparently were extrapolated into a rate of 60 per year. Deposition at 53. The method of collecting data and determining the number of gross navigational errors has not been discussed. Furthermore, the number of runs during the period was considered to be representative as the result of visual inspection of additional data, but the data inspected were not produced for the record or statistically analyzed to support the representative nature of the number of runs. Deposition at 54. What we do know is that the sample had 354 scored bomb runs during a year in which there were 2986 runs, suggesting that the annual occurrence of navigational error should be projected to be over eight (not six) times the number occurring in the sample period. Compare deposition at 51. Furthermore, the number of gross navigational errors was considered to be representative as a result of unreported interviews. Deposition at 55. Considering that the deponents are SAC employees and that the Bayshore run is of very great importance to SAC (deposition at 31), it would be helpful if additional data and statistical verification were made available.

(4) There is some ambiguity about whether the number of "scored runs", used in the Analysis, equals the total number of flights on the Bayshore run or whether substantial additional use is made of the corridor.

(5) There is no discussion about the nature of accidents to which the relevant aircraft are subject when flying low-altitude missions. Indeed, there is no discussion of the nature of the accidents to which these aircraft are subject, during either regular or low-altitude missions. Hence, it is impossible to know whether the crash area of 3 square miles around the plant, used in the Analysis, is conservative or not. Deposition 108-111. In particular, there is no discussion of whether an error in altitude might accompany an error in course so that no further event need intervene before a crash occurs. There also is no consideration of whether there are credible accident events that could lead to long, uncontrolled glides that might commence even while a plane was on-course.

(6) The experience with crashes of the relevant aircraft appears to have been applied to the Bayshore Range without recognition that low-level missions may be more hazardous than other flight activity.

(7) There is no allowance for failure of communication other than through complete loss of power, assigned a value of 1.7×10^{-3} . Yet, pilot inattentiveness or mishearing would appear to be a credible source of failure of communication. Indeed, one overflight is known to have occurred

despite radio communication to the crew that they had exceeded the Western limit of the corridor. Betourne/Thomas Exhibit #2 at Telegram by Richard J. Camp, Operations Analyst.

(8) There is a need to explain the circumstances which led Col. James M. Campbell to reassure Consumers Power Company, in a May 19, 1971, letter that, "We trust our analysis will . . . provide you a basis for reaching an agreement with your insurers." Betourne/Thomas Deposition, Exhibit #2. Is there any relevant correspondence with the insurers? Is there an actuarial computation of risk which could be made available in this proceeding?

(9) Did SAC perform any other analyses for the purpose of deciding whether to move the Bayshore Range? What do those analyses show? Why was the Bayshore Range moved? How was the decision reached?

(10) Is it proper to assume that the probability of a navigational error is independent of the probability of a crash or is it more likely that a crew which would make a gross navigational error would become involved in a crash? Is independent probability correct if the navigational error was induced by an equipment failure?

(11) Is the method of notifying pilots of the Big Rock Point no-fly zone adequate? If the Bayshore Route is used for non-scored runs, is the method of notifying such users of the no-fly zone adequate?

There is an additional problem raised by this contention. In the course of discovery, Mr. O'Neill found out that there had been a flyover of the plant at extremely low altitudes. Indeed, R. M. Marusich of Consumers Power Company described the incident in a July 23, 1981, memorandum as one in which plant staff said the planes "sounded like they were just above the trees."

Mr. O'Neill asks that we consider this information germane to his contention. Motion to Amend, November 20, 1981. Since this problem was uncovered through discovery, the motion to amend is granted. (However, we consider Mr. O'Neill's accompanying, unsupported assertions about air traffic controllers and Class 9 accidents to be inadequate to support the admission of additional matters at this late stage of the proceeding.)

We are concerned about the Air National Guard incident because there is no official account of how the planes got to be over the plant and there is no official admission that this event did occur. The only responsive action taken has been adoption by the national guard of a 1500 foot high no-flight zone within two nautical miles of the plant. December 29, 1981, Memorandum of William P. Hickey, of the Ohio Air National Guard to Mr. Kaz Campe of the staff (filed on January 18, 1982).

We also note that Mr. O'Neill has complained of an overflight incident which he personally witnessed while peacefully demonstrating at Big Rock Point. In that incident, a small plane allegedly buzzed the demonstrators.

This raises the question of the frequency with which small planes overfly Big Rock Point, which has a containment that is not reinforced with concrete.

D. Conclusion

For reasons stated in the previous portion of this memorandum, we find that intervenors have raised a genuine issue of fact concerning the safety of Big Rock Point and its expanded spent fuel pool from military planes using the Bayshore Range for training or other uses, from planes used by the Ohio Air National Guard and from small unscheduled airplanes. See *Public Service Electric and Gas Company et al. (Hope Creek Generating Station, Units 1 and 2)*, ALAB-429, 6 NRC 229 (1977) (analyzing the probability of an accident involving a liquid natural gas tanker). For that reason the motion for summary disposition of this contention is denied and the contention shall be interpreted to raise the issues discussed in this paragraph and in the preceeding text of this portion of the memorandum.

VIII. O'NEILL CONTENTION II.C.

A. The Contention

O'Neill contention II.C. states:

Licensee's plan, which provides for makeup water to replace water being lost from the pool at rates of up to 200 gallons per minute, is deficient because it does not consider the impact of the lost water on health and safety or the environment.

B. Arguments in Favor of Summary Disposition

Applicant asserts that the 200 gallons per minute capacity of the fire system, which provides makeup water to the spent fuel pool, is never going to be taxed because the maximum rate of loss from the fuel pool is 11 gallons per minute, which would occur if the pool boiled when a full core of reactor fuel had just been put into the expanded pool. Bordine at 1-3. Staff agree with Applicant of this point (Donohew at ¶5, p. 2) and argue as well that the only makeup water issue is the incremental effect of the expansion in the spent fuel capacity. Staff argues that the incremental effect would be minimal, for reasons discussed above in section IIIB. of this memorandum.

C. Arguments Against Summary Disposition and Specific Conclusions

Mr. O'Neill argues that the full 200 gallon per minute makeup capacity of the spent fuel pool could be required. He cites SER §3.4.2.1, which considers the possibility of an accident involving a drop of the spent fuel transfer cask and gives, as one reason for concluding that the pool is safe from a cask drop, the availability of 200 gallon per minute makeup capacity. In addition, we note that the enclosure sump has a capacity of 50 gallons per minute. Bordine at 2. Any rupture of the fuel pool likely would lead to continuous pumping of 200 gallons per minute until the containment filled and the fire pumps would have to be shut down. Consequently, the fire water system does not appear to be a reliable, continuing source of makeup water, raising the genuine issue of fact of whether the spent fuel pool is adequately protected against a drop of the fuel transfer cask. See also Probability Risk Assessment at 104.

Mr. O'Neill also argues without further citation to authority that the pool is not seismically safe. However, we reject this as a genuine issue of fact because of the uncontradicted facts filed by applicant relevant to the contention discussed in paragraph II C.11. of this memorandum.

Of greater concern is Mr. O'Neill's assertion—relying on W.J. Hall's "Final Letter Regarding Continued Operation of the Big Rock Point Plant" (July 15, 1981)—that the overhead crane used for handling fuel assemblies and casks is not seismically qualified and could fall into the pool in a seismic event, causing a breach of the pool.

In addition, Mr. O'Neill asserts—again relying on the Hall letter—that the use of a standard threaded pipe in the fire water system is not seismically safe. Although we are troubled by this argument because it is from a reputable source and does not seem to be analyzed in the SER, it is not relevant to this contention, as originally worded, because failure of the makeup water system would prevent the 200 gallons per minute flow which this contention asserts would be unsafe.

Consequently, we find that the contention, as originally worded, does not raise any genuine issues of fact and the motion for summary disposition is granted to the extent that it relates to the exact wording of the contention, as originally admitted. However, in the course of discovery the intervenors have discovered information that does raise genuine issues of fact, related to the subject matter of this contention, and these issues should be considered. Consequently, we reword O'Neill contention II C., as follows:

Is the spent fuel pool safe from a rupture which might be caused by a drop of a spent fuel transfer cask or of the overhead crane?

The genuine issues of fact under this contention are whether the overhead crane used for handling fuel assemblies and casks is seismically safe, whether the threading on the fire water system piping is seismically safe, and whether it is necessary for the safety of the enlarged spent fuel pool that 200 gallons per minute of makeup water be available to protect the pool from the consequences of a drop of a spent fuel transfer cask.

IX. O'NEILL CONTENTION II.G.(b)

A. The Contentions

O'Neill contention II.G.(b) is subject to an uncontested motion for summary disposition. It states:

Fuel has escaped the racks and remained undiscovered for a considerable time. Because the design of the new rack does not specifically address this occurrence, the design is deficient.

The contention, though potentially troubling, turns out to have little safety significance. There was an incident in which a fuel rod was misplaced, on the floor of the spent fuel pool, where it remained for about a year. Staff at 27. Quality control measures have been instituted to reduce the likelihood of a recurrence of this event. *Ibid.* However, the event does not reflect on the design of the new spent fuel rack.

Consequently, this contention does not raise a genuine issue of fact and it is dismissed.

X. O'NEILL CONTENTION II.E.-3

On February 5, 1982, we issued a separate Memorandum and Order dismissing the motion for summary disposition of this contention, dealing with whether the spent fuel pool's k_{eff} , which is the chain reaction constant, meets Commission standards.

Since that date, we have analyzed a journal article called to our attention in the affidavit of Charles W. Huver, Ph.D., submitted in behalf of Christa-Maria. The article is Cano, J.M., Caro, R., and Martinez-Val, J.M., "Supercriticality Through Optimum Moderation in Nuclear Fuel Storage." 48 Nuclear Technology at 251-260 (1980). We conclude that this article raises a genuine issue of fact concerning whether the Big Rock Point spent fuel pool might reach supercriticality if it were to begin boiling. In particular, the article concludes that calculations of supercriticality "seem to depend on the computer codes and methodology employed, yielding results that disagree with each other to a relevant extent." *Id.* at 251. Furthermore, the article finds k_{eff} to be positive for a wide

range of water densities and spent fuel pool rod spacings. See, e.g. Fig. 2. *Id.* at 253.

This journal article appears to raise serious questions which should be addressed by the staff and the applicant.

XI. BOARD QUESTION 1

A. The Question

Board Question 1 states:

Has the proper operation of any of the valves mentioned in items 5 and 6 on page 4 of the Safety Assessment (*viz.* valves CV/4096, CV/4097, CV/4027, CV/4105, and MO/7050) been relied upon to mitigate the results of an accident in the spent fuel pool? If so, how would a failure of the type experienced with these valves affect the results of such an accident?

B. Analysis of Motions for Summary Disposition

Applicant argues that only valves CV/4096 and CV/4097 are relied on to mitigate the results of an accident in the spent fuel pool. Those two valves are containment ventilation valves and one of them would need to operate properly in order to isolate the containment should it become pressurized in a fuel pool accident. Bordine at 1. Valve CV/4097 has experienced repetitive leakage and was modified in the Spring of 1979; it has not leaked significantly since. *Ibid.* Moreover, both valves are scheduled for further modification during the forthcoming fueling outage, prior to installation of the new racks. Bordine at 2.

Valve CV/4027 connects pipes coming from the spent fuel pool surge tank, cooling system, and cleanup demineralizer system to the radwaste system. Bordine at 3. (See Paulson at 2: "No direct piping connection exists from the spent fuel pool cooling system . . .") It has experienced excess leakage. *Ibid.* In addition, Valve CV/4117 is redundant to CV/4027 and has been operable in prior incidents of excess leakage of CV/4027. *Ibid.* However, after CV/4027 was disassembled and repaired in November 1980, both of these valves failed a leak test, conducted on September 19, 1981, LER 81-23. The cause of the excess leakage has not yet been identified, although applicant "is expending efforts" to correct the problem. Bordine at 3.

Despite the questionable performance of CV/4027 and CV/4117, leakage from the spent fuel pool cooling system is not possible because upstream valves VSFP17 and VSFP119 are normally maintained in the closed position to prohibit unintentional water flow. Bordine at 4. There

also is a siphon-breaker in the makeup line to the pool which would prevent water from being siphoned from the pool as a result of a pipe failure.

Valve CV/4105 does appear to be involved in mitigation of fuel pool accidents although its operation is not essential because of redundant systems. This valve is a control valve located outside of containment that provides demineralized water for a variety of purposes, including the spent fuel pool and surge tank. Bordine at 5. No repetitive failures of this valve have occurred. Ibid. (Backflow of water from the containment to the outside is prohibited by several check valves. Ibid.) Furthermore, if this makeup water source fails, makeup water can be supplied from treated waste water and from the fire hose. Paulson at 3.

Valve MO/7050 is the Main Steam Isolation Valve, and its operation is not related to the safety of the spent fuel pool.

We conclude that there is no genuine issue of fact concerning this Board question and that summary disposition should be granted.

XII. BOARD QUESTION 2

A. The Question

Board Question 2 is:

Did the facts learned from the loss-of-feedwater event at Oyster Creek on May 2, 1979, suggest any measures, other than those included in Amendment 30 to the Big Rock Point Technical Specifications which would be important in preventing a severe loss-of-feedwater accident? Could an accident which might occur from this cause threaten the Licensee's ability to maintain the spent fuel pool in a safe condition?

B. Arguments in Favor of Summary Disposition

Applicant moved for summary disposition of this question, offering the affidavit of David B. Blanchard. Staff supports summary disposition, offering the affidavit of Marvin W. Hodges. No party opposes the motions.

The arguments and affidavits favoring summary disposition assert that:

(1) The Oyster Creek incident was a potential (not actual) uncovering of the reactor core, brought about by an inability to gauge the water level over the core because the water level indicator measured water in an annulus surrounding the core and not in the core itself. During the Oyster Creek incident, a series of valves were closed, causing the water level in the

annulus to differ substantially from the water level in the core, making the water level indicators unreliable indicators of the level of water in the core. Applicant at 1-2. Blanchard at 1-2, 4-5. Staff at 31. Hodges at 1-2.

(2) Operators of Big Rock Point could not be misled by their water level indicators, which read the water level directly from the core and not in an annulus region. Applicant at 1-2. Blanchard at 3-4, 8. Staff at 31. Hodges at 2.

(3) Armed with an accurate indication of the level of water in the core, a Big Rock operator may take several remedial actions, including one option not available at Oyster Creek—use of control rod drive pumps to add water to the core. Because of the smaller size of the Big Rock Point reactor, these quantities of water are likely to be sufficient to cool its core. Applicant at 2. Blanchard at 9. Hodges at 3.

(4) The change to the spent fuel pool does not increase the probability of such an accident or of similar ones. Applicant at 2-3. Blanchard at 8.

(5) Even were the core uncovered and damaged, the fuel pool could be maintained properly. (See Section II of this memorandum.) Applicant at 3. Blanchard at 9-11. Staff at 32. Hodges at 3.

After considering these arguments, we agree that there is no special reason to fear an Oyster-Creek type incident at Big Rock Point. Consequently, the motions for summary disposition of this question are granted.

XIII. LATE-FILED TESTIMONY

On February 5 and 10, 1982, applicant filed a Motion to Strike Affidavit of Dr. Michio Kaku and Alternative Motions to Clarify Status of John O'Neill's Final Filing on Summary Disposition. These filings raise questions concerning possible impropriety in "ex parte" discussions between the Board and the intervenors and they also request that the filings be struck from the record as untimely.

We take these motions seriously, as they invoke our responsibility to manage this proceeding fairly and efficiently. However, we have decided to deny the motions.

On January 26, 1982, Ms. Christa-Maria spoke to Judge Bloch by telephone, informing him that the affidavit of Michio Kaku had been accidentally misrouted and that no firm date for its arrival could be set. Mr. O'Neill filed a written motion relating to difficulties cause by blizzard conditions, resulting in late filing of Mr. Hendrix's testimony. When Judge Bloch communicated the granting of an extension in the deadline by telephone to a person answering Mr. O'Neill's line, Mr. O'Neill claims to have misunderstood the nature of the extension which was granted. Hence,

in a telephone discussion late in the week of January 24, he requested that he also be permitted to file testimony of Dr. Huver by February 1, 1982. The Board orally granted these motions.

We do not consider these discussions on extensions of time to be inconsistent with the *ex parte* rule nor do we consider the extensions to have been unfairly granted. First, the *ex parte* rule relates only to discussions of "any substantive matter at issue in a proceeding on the record" Second, we required Mr. O'Neill to report our conversation for the record and we have now reported our conversation with Ms. Christa-Maria. Third, we consider this procedure to be appropriate for an officer presiding at a trial, in the interest of expedition. Because there are many filing deadlines in a trial-type proceeding, matters can be expedited by ruling promptly on motions for extensions rather than leaving questions up in the air or arranging for telephone conferences for each such question. While conferences are appropriate for major procedural matters or lengthy extensions of time, the arranging and holding of such conferences can delay a proceeding unnecessarily. Unlike appeals, where delays are more unusual and there are only one or two deadlines subject to possible extension, requests for extensions of time in trials may occur frequently and inexpeditious handling of requests may mount up to substantial delays in the course of a proceeding.

We also were aware that any ruling we made about an extension would be subject to reconsideration upon a subsequent showing that we had been in error. It is our belief that acting first, subject to reconsideration, is more expeditious.

In this instance, the proceeding was not substantially delayed by the granting of these extensions of time. The Board was already analyzing filed materials and found itself able to fit the late-filed documents into the ongoing review in an expeditious fashion. If these documents had been filed one week earlier, the timeliness would not have advanced our decision by a single day.

We accept blizzard conditions and misunderstandings as adequate explanation of late filing because the proceeding did not suffer serious delay as a result. Our lenience on this occasion should not, however, be interpreted to condone subsequent delay.

There is an additional reason why these late filings should be accepted. These filings have raised serious matters for our consideration. Dr. Huver's affidavit was particularly helpful, in part because of its reference to the *Nuclear Technology* article on supercriticality. Dr. Kaku's testimony also may prove to be important should applicant not be able to persuade us of the reliability of the systems designed to provide makeup water to the fuel pool. We would not lightly exclude testimony so directly relevant to the safety of the spent fuel pool amendment being sought. Furthermore, we

would not unduly handicap intervenors who have so carefully scrutinized a difficult technical record and who have managed to assist the Board by raising important safety issues that might otherwise have failed to receive the careful scrutiny that they merit.

XIV. SCHEDULING MATTERS

The Board anticipates convening an on-the-record telephone conference for scheduling purposes. At that conference, decisions will be reached concerning the date for holding an evidentiary hearing and dates for determining unresolved issues concerning the possible need for an environmental impact statement.

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is this 19th day of February, 1982,

ORDERED

(1) Summary disposition is granted with respect to the following contentions: Christa-Maria 3, O'Neill I.B.-5, II.B., II.E.-3, II.F., and II.G.(b) and Board questions 1 and 2.

(2) Summary disposition is granted in part with respect to the following contentions: Christa-Maria 2 and 8 and O'Neill II.A., II.C., and II.E.-2. Specific sections of this memorandum that discuss these contentions shall govern the extent to which further litigation of these contentions is permitted.

(3) Summary disposition is denied with respect to O'Neill contention II D.

(4) O'Neill contention II.C. is reworded to read as follows:

Is the spent fuel pool safe from a rupture which might be caused by a drop of a spent fuel transfer cask or of the overhead crane?

(5) Applicant shall submit an affidavit concerning the use of techniques to minimize the corrosion sensitization of the materials used in the spent fuel rack. This affidavit shall respond to the concerns expressed in the last paragraph of section VI.C. of this memorandum.

(6) This is an interlocutory order and is not subject to appeal.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

**Dr. Oscar H. Paris
ADMINISTRATIVE JUDGE**

**Mr. Frederick J. Shon
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Peter B. Bloch, Chairman
Jerry R. Kline
Frederick J. Shon

In the Matter of

Docket Nos. 50-440-OL
50-441-OL

**CLEVELAND ELECTRIC
ILLUMINATING COMPANY, et al.**
(Perry Nuclear Power Plant,
Units 1 and 2)

February 19, 1982

The Board announces procedures to make its trip to the General Electric Control Room simulator near Tulsa, Oklahoma, as informative as possible. It expresses an interest in being informed about the General Electric Nuclenet 1000 Control Room, and it explains that its interest in being informed relates to the possibility that it may subsequently raise a *sua sponte* issue concerning control room reliability.

**RULES OF PRACTICE: *SUA SPONTE* ISSUE (PRELIMINARY
INVESTIGATION)**

A Board may seek information which will help it to decide whether or not to raise a *sua sponte* issue.

MEMORANDUM
(Concerning Visit to General Electric Control Room Simulator)

On February 12, 1982, Cleveland Electric Illuminating Company (applicant) filed a letter relating to the trip the Board has scheduled for March 5, 1982, to the General Electric Control Room Simulator near Tulsa, Oklahoma. That simulator contains a control board similar to that

scheduled for use at Perry. Nearby, there is a Nuclenet 1000 control room simulator.

Applicant informs us that it has arranged a simulation for us and we are grateful for its cooperation. To make the simulation more meaningful, however, we urge that the operators know neither the order of the tasks they will perform nor the precise incidents they will handle. In addition, the Board hopes it may be able to suggest a limited number of incidents of its own while it is on the site.

Applicant also tells us that a simulation on the Nuclenet 1000 simulator could not be arranged because of its cost. This is somewhat puzzling to us because the idea of seeing that particular installation was suggested to us by Robert M. Ketchel, Manager, Regulation & Marketing Support for General Electric Company. He seemed proud of this new control room model and thought he could show it to us.

It may be that the Board does not need to see full use of the Nuclenet 1000 simulator, if that is too costly. However, we hope that the Commission staff and applicant will work together to arrange a meaningful tour. Although there are no issues relating to the control room presently in this proceeding, the Board wishes to be informed so that it will know whether or not to raise a *sua sponte* issue should that be appropriate in the future. There is broad agreement that chance of human error is an important contributor to the risk of power reactor accidents. We believe that information about this important subject should be made available to us.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Peter B. Bloch, Chairman
Jerry R. Kline
Hugh C. Paxton

In the Matter of

Docket Nos. 50-266-OLA
50-301-OLA

**WISCONSIN ELECTRIC POWER
COMPANY**

(Point Beach Nuclear Plant,
Units 1 and 2)

February 19, 1982

Failure to respond fully and in good faith after the Board orders a response to interrogatories may result in adverse findings of fact. However, the Board need not yet decide whether to make adverse findings in this proceeding, in which a special summary disposition procedure was adopted. The procedure places the burden of going forward on summary disposition on the Intervenor. The effect of adopting that procedure may be to alleviate some of Applicant's difficulties if there have been incomplete responses to interrogatories about Intervenor's case.

The Board need not act on a motion for a continuance that is not yet ripe. Should Intervenor subsequently find, nearer to the conclusion of this case, that important information about steam generator tube repair is being assembled but has not yet been made available, a motion for continuance may then be appropriate.

A change in plans concerning whether or not to conduct a full scale sleeving repair project in one of Applicant's units is not a reason to dismiss a portion of the requested amendment.

RULES OF PRACTICE: MOTION TO COMPEL

Once a Board has required a response to interrogatories, Intervenor may not effectively limit its obligation to comply with the Board's order by using limiting language in its response.

RULES OF PRACTICE: MOTION TO COMPEL (ADVERSE FINDINGS)

Although failure to comply with a Board order to respond to interrogatories may result in adverse findings of fact, the Board need not decide what adverse findings to adopt until action is necessary. When another procedure has been adopted requiring Intervenors to shoulder the burden of going forward on a motion for summary disposition, it may be appropriate to await Intervenor's filing on summary disposition, before deciding whether or not to impose sanctions for failure to respond to interrogatories pursuant to a Board order. Sanctions only will be appropriate if failure to respond prejudices Applicant in the preparation of its case.

RULES OF PRACTICE: MOTION CONCERNING LITIGABLE ISSUES

The Board required Intervenors to file a Motion Concerning Litigable Issues, by which the burden of going forward on summary disposition was placed on the Intervenors. However, Applicant and Staff will have to respond and Intervenors will reply. Thereafter, the standard for summary disposition will be the same as required under the rules.

This special procedure was appropriate because time pressures had caused the Board to apply a lax standard for admission of contentions, depriving Applicants of full notice of the contentions in the proceeding, and because Applicants had already shown substantial grounds for summary disposition of all contentions in the course of a hearing that had already been completed.

RULES OF PRACTICE: LAX STANDARD FOR ADMITTING CONTENTIONS (TERMINATION)

Although it is appropriate to admit contentions more freely than ordinary practice permits because of time pressures on a proceeding, the extraordinary freeness in admitting contentions should be terminated when the time pressures are reduced because Applicant has changed its operational plans.

MEMORANDUM AND ORDER
(Concerning a Motion to Compel and Other Matters)

On February 2, 1982, Wisconsin Electric Power Company (applicant) moved to compel Wisconsin's Environmental Decade (Decade) to respond more fully to its interrogatories of November 10, 1981. Decade responded to this motion by letter of February 5, 1982.

We also have before us Decade motions to dismiss without prejudice the portion of the amendment which would relate to the sleeving of tubes in Point Beach Nuclear Plant Unit 1 and to indefinitely continue the proceeding pending receipt of information on a January 25, 1982 steam generator tube-rupture incident at the Ginna Nuclear Plant and of information about extensive corrosion discovered in the steam generator in TMI Unit 1.

I. MOTION TO COMPEL

This is not the first time we have been called on to act on the alleged inadequacy of Decade's response to applicant's November 10 interrogatories. On January 11, 1982, we conducted an on-the-record telephone conference in which we ordered Decade to "fully answer in good faith the interrogatories that were submitted by the applicant." Tr. 899. We also pointed out that if Decade failed to respond fully and in good faith "there could be negative inferences drawn and [Decade] might thereby lose the right to litigate certain issues at a hearing." We also specified that Decade should identify any of Licensee's interrogatories which it was not answering (Tr. 897) and that "failure to respond to an interrogatory would constitute an admission that Decade had no information responsive to that interrogatory." Tr. 896-97, 899.

Now applicant approaches us again for relief. It points out that many of its interrogatories have drawn no response and that Decade continues to assert certain limitations on the nature of the review which it has conducted in order to respond to the interrogatories.

Before ruling on these matters, we find it necessary to remind the parties that this Board has important responsibilities related to the safety and environmental acceptability of the proposed license amendment. Our principal concern is to review carefully and thoroughly every important substantive issue brought to our attention. Parties can assist us in effectively allocating out time by being responsive to the spirit and intention of Board orders and by avoiding actions which will contribute to unnecessary procedural squabbles.

In this case, we take seriously applicant's complaints about Decade's response to its interrogatories. We remind Decade that adverse inferences

can be drawn if we subsequently find that it failed to respond fully and in good faith, as directed. Language attempting to limit its response to applicant's interrogatories to anything less than a full, good faith response that complies with each aspect of our on-the-record orders does not in any way reduce its responsibility to comply fully with the Board's previous order.

Nonetheless, we find it appropriate to defer ruling on applicant's motion at this time. Consideration of the entire procedural context in which this dispute arises persuades us that we are unable at this time to determine what prejudice, if any, has accrued to applicant as a result of the responses to its interrogatories.

We have already adopted a special procedure that will help to ameliorate applicant's difficulties. Although the procedure we adopted for other purposes, its use also will help to remedy applicant's difficulty in being fully informed about Decade's case through the discovery process.

We have required Decade to file a Motion Concerning Litigable issues. Tr. 890-892. This procedure is designed to redress possible difficulties which applicant may suffer because of another procedure we adopted to resolve a problem Decade had. Decade's problem arose from the extraordinary time pressures with which it was confronted as this proceeding began. The proceeding began in August. Applicant planned to institute a demonstration program during its Fall outage and a full-scale sleeving program in the Spring.

The procedure we adopted to assist Decade was the admission of a broad, generalized contention so that Decade need not move separately for the admission of issues it uncovered in the course of discovery. Considering the time pressures, we thought it preferable to permit broad latitude for raising new issues. However, a consequence is that applicant is less well informed than usual about the issues Decade may raise.

We also note that applicant previously demonstrated that several of Decade's arguments fail to raise a genuine issue of fact. LBP-81-55, 14 NRC 1017 (1981). Although that showing was made in the context of the authorization of a limited demonstration program involving the repair of only six steam generator tubes, many of the arguments had broader implications. Hence the Board was able to anticipate that applicant would move for summary disposition, with substantial grounds.

Under these circumstances, we considered it appropriate to shift the burden of going forward (but not the burden of proof) to Decade, which must file a Motion Concerning Litigable Issues, in which it must show the existence of genuine issues of fact. At that time, it must display all the evidence it relies on to establish genuine issues of fact. Broad references to materials not incorporated in the motion will not be accepted. The motion must be self-contained, with the exception that arguments which have been

fully explained may be supported by references to materials that are available to the parties and the Board.

After Decade files its Motion Concerning Litigable Issues, applicant and staff will respond. Then Decade will reply. Thereafter, the case will be decided precisely as it would on a motion for summary disposition commenced by a filing by applicant or staff. The difference is that applicant and staff need not anticipate a wide range of possible genuine issues of fact as they would in filing a motion for summary disposition. They may wait to ascertain which issues Decade relies on. (None of the parties has raised any substantial objections to the use of this procedure.)

We anticipate that applicant could, even given the applicability of this special procedure, experience some prejudice if Decade has not responded fully to its interrogatories. This prejudice could occur if applicant is knowingly kept ignorant of grounds for a contention. Were we to find that to have occurred, we would view that particular ground in a very dim light and likely would exclude it from consideration, as applicant will have been deprived of a full and fair opportunity to prepare its response. Consequently, we urge Decade to satisfy itself that applicant is kept informed, on an ongoing basis, of the grounds for Decade's contentions, which have been the subject of applicant's interrogatories. We intend this proceeding to be governed by principles of full disclosure and will not permit it to resemble a game of hide-and-go-seek.

II. MOTION TO DISMISS THE APPLICATION IN PART

Recently, applicant had told us that it no longer plans to repair its Unit 1 during the Spring of 1982 and that it probably will never do full-scale sleeving work on that unit. Decade has moved to dismiss the application for an amendment with respect to Unit 1. However, we consider this motion to be groundless. Applicant seeks a change in the technical specifications for its power reactors so that it may repair them pursuant to the changed specifications at a time of its choosing. We see no reason why a change in the timing or extent of repairs should affect applicant's right to seek a license amendment. Nor has Decade provided us with any authority to the contrary. Consequently, Decade's motion is denied.

III. MOTION FOR A CONTINUANCE

Decade has requested a continuance of this proceeding so that additional information will be available concerning a January 25, 1982, incident at the Ginna Nuclear Plant, concerning steam generator corrosion at TMI-1, and concerning other developments that may occur in the technology of tube repair.

We consider this motion not to be ripe. Our existing procedural order will permit Decade to frame interrogatories in light of information that will be contained in the staff's Safety Evaluation Report, which has not yet been issued. Ordinarily, this report could be expected to address safety problems which are related to the Point Beach amendment and we would expect that any relevant information from Ginna or TMI-1 would be reflected in the staff's safety analysis. In addition, we expect official notification concerning the Ginna incident because of its occurrence in a steam generator with some similarity to Point Beach; and we also would expect staff to inform us of the possible relevance of information derived from a review of the situation at TMI-1.

If Decade subsequently finds, as the discovery period approaches a close, that it needs additional information that will soon be available, then it should move at that time for a continuance—indicating what information is being awaited, when it can be expected to be available and why it is thought to be important to a proper determination in this case. Then applicant and staff will respond and the Board will rule on a specific problem. (In addition, if Decade were to raise serious safety concerns in the course of this proceeding and those concerns might be resolved by awaiting specific subsequent developments, any party might then request a continuance.)

Generally, continuances are not favored as we are charged with making safety determinations with respect to a developing technology. Were we to make a general practice of awaiting technological developments we might never decide a case, and we would not fulfill our Congressional mandate to decide licensing cases. However, for specific reasons continuances of limited duration might be granted.

IV. CONTENTIONS

Now that we have been informed by applicant that tube sleeving in Unit 1 will not take place this Spring, considerable time pressure has been removed from this proceeding. Consequently, it is no longer appropriate to admit new contentions freely, under the broad contention admitted by the Board. We therefore rule that Decade may properly raise all matters already submitted on the record of this proceeding, pursuant to the liberal policy we have employed. However, as of this date, late contentions will be admitted only if they comply with the criteria for the admission of late contentions. 10 CFR §2.714(a)(1).

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is this 19th day February, 1982,

ORDERED

(1) Wisconsin's Electric Power Company's Motion to Compel is deferred for subsequent Board action.

(2) Wisconsin's Environmental Decade's (Decade) Motion to Dismiss Without Prejudice a Portion of the Amendment is denied.

(3) Decade's Motion for a Continuance is denied without prejudice to refile at a more appropriate time.

(4) This is an interlocutory decision and is not subject to appeal.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Peter B. Bloch, Chairman
Dr. Jerry R. Kline
Mr. Frederick J. Shon

In the Matter of

Docket Nos. 50-440-OL
50-441-OL

**CLEVELAND ELECTRIC
ILLUMINATING COMPANY, et al.**
**(Perry Nuclear Power Plant,
Units 1 & 2)**

February 26, 1982

A motion to admit two late contentions is denied. One contention relates to the disposal of nuclear waste and the other to the need for magnesium oxide bricks beneath the reactor vessel.

The principal reason for rejecting the nuclear waste contention is that Boards are explicitly barred from considering such a contention by the Commission. The reasons for rejecting the magnesium oxide bricks contention are that the appearance of a newspaper article is not sufficient grounds for the late-filing of a contention about matters that have been known for a long time and that intervenors had not demonstrated that they could contribute to this issue because their filing did not discuss any of the technical problems related to MgO₂ bricks and did not relate the need for the bricks to any specific characteristics of the Perry plant.

RULES OF PRACTICE: GOOD CAUSE FOR LATE FILING

The appearance of a newspaper article is not sufficient grounds for the late-filing of a contention about matters that have been known for a long time. Furthermore, in deciding whether to admit a late contention, adverse weight may be given to intervenors' failure to show any mastery of relevant technical materials and failure to show the relevance of their contention to the particular characteristics of the plant involved in a licensing proceeding.

RULES OF PRACTICE: JURISDICTION OF BOARDS (PENDING RULEMAKING)

Boards may not exercise jurisdiction over contentions if those contentions are the subject of a pending rulemaking and the Commission has explicitly barred Board consideration of the subject of the contention.

TECHNICAL ISSUES DISCUSSED:

Waste disposal;
Magnesium, oxide bricks;
Core catcher.

**MEMORANDUM AND ORDER
(Concerning Late-Filed Contentions: Waste Disposal
and MgO₂ Bricks)**

On November 21, 1981, Ohio Citizens for Responsible Energy (OCRE) requested leave to file two late contentions, one with respect to the likelihood that nuclear waste will be disposed of effectively (waste disposal contention) and one with respect to the need for magnesium oxide (MgO₂) bricks beneath the reactor vessel (core catcher contention). Cleveland Electric Illuminating Company (applicant) and the staff of the Commission (staff) have responded to these contentions; and, on January 13, 1982, OCRE replied, pursuant to our specially adopted requirement that such replies must be filed.

We have decided not to admit either of these late contentions into this proceeding. However, we suggest possible avenues which OCRE may explore to obtain a determination concerning its core catcher contention.

I. WASTE DISPOSAL CONTENTION

OCRE Contention #15 is:

The Applicant has not provided reasonable assurance that it will be able to safely store and/or dispose of the radioactive materials that will be generated by Perry Nuclear Power Plant. See 10 CFR section 50.57(a)(3) and 42 U.S.C. section 4332(2)(C)(1976). That this matter poses serious concerns for the health and environment of OCRE members is undisputed. *Vermont Yankee Nuclear Power Corp. v NRDC* 435 U.S. 519 (1978).

OCRE alleges a basis for this contention by citing *NRDC v NRC* 547 F2ds 633, 641 (1978) and NUREG-0782.

We need not decide whether or not there is an adequate basis for this contention. Its adjudication is beyond our jurisdiction by explicit direction of the Commission, which stated, in announcing the initiation of a rulemaking concerning the disposal of radioactive waste:

During this proceeding the safety implications and environmental impacts of radioactive waste storage on-site for the duration of a license will continue to be subjects for adjudication in individual facility licensing proceedings. The Commission has decided, however, that *during this proceeding the issues being considered in the rulemaking should not be addressed in individual licensing proceedings. These issues are most appropriately addressed in a generic proceeding of the character here envisaged.* Furthermore, the court in the State of Minnesota case [*State of Minnesota v. N.R.C.* 602 F.2d 412, 419 (C.C.D.C. 1979)] by remanding this matter to the Commission but not vacating or revoking the facility licenses involved, has supported the Commission's conclusion that licensing practices need not be altered during this proceeding. However, all licensing proceedings now underway will be subject to whatever final determinations are reached in this proceeding.

44 Fed. Reg. at 61373 (emphasis added by applicant). *See also Potomac Electric Power Co. (Douglas Point Nuclear Generating Station, Units 1 and 2)*, ALAB-218, 8 AEC 79, 85 (1974) (waste disposal issues are subject to a generic rulemaking proceeding and ought not to be included in individual licensing proceedings). *Compare Cleveland Electric Illuminating Company, et al. (Perry Nuclear Power Plant, Units 1 & 2, LBP-82-1A, 15 NRC 43 (1982).* (The application of existing rules concerning anticipated transients without scram cannot be avoided because of a rulemaking proceeding which has not expressly enjoined licensing boards from considering the issues.)

OCRE pleads that the Commission's rulemaking is not "effective" and that, consequently, it has no adequate remedy other than in this proceeding. However, OCRE has not substantiated its allegation that the rulemaking is not effective and it also misapprehends the legal setting in which we might address that question.

It would be an uphill battle under any circumstances for OCRE to persuade us that a rulemaking instituted by the Commission, which is our master, is not effective. However, OCRE has not even bothered to inform us of the status of that proceeding nor has it indicated why the Commission's Second Prehearing Memorandum and Order (November 9, 1981) — cited in footnote 3 of applicant's response—does not demonstrate that substantial progress is being made. Indeed, there would seem to be little

sense in our beginning to litigate these issues here after extensive evidence has already been received in the rulemaking proceeding; and OCRE fails to persuade us that there is any reason to believe that we can be any more effective than can the Commission in that parallel proceeding.

We also note that OCRE relies on a portion of an appeals court decision which was overruled. It states that *NRDC v NRC* 547 F.2d 633, 641 (1977) requires that issues be considered in licensing proceedings unless they have been considered in *effective* generic proceedings. However, that ground for decision was overruled by *Vermont Yankee Nuclear Power Corp. v NRDC* 435 U.S. 519 (1978) and similar language was not employed in the subsequent *State of Minnesota Case*, which was discussed by the Commission as a reason for the ongoing rulemaking proceeding.

OCRE's interest in this important issue could more appropriately have been addressed in the rulemaking proceeding. We are without authority to receive its arguments here. (We find no reason to have a rule on whether there was good cause for the late filing of this contention.)

II. CORE CATCHER CONTENTION.

Despite the early stage of this proceeding and our generally forgiving attitude toward the late admission of important safety or environmental issues, we find that OCRE has not shown good cause for the late filing of its Contention #16, which follows:

The Applicant should include in its containment design for Perry Nuclear Power Plant the use of magnesium oxide bricks. While this Intervenor has not fully investigated the utilization of this material or of its mechanism, it relies upon a *Wall Street Journal* article (November 13, 1981 at 29) to base its contention. The article states that the reactor cores of planned off-shore nuclear plants will be surrounded by "magnesium oxide bricks to keep any core meltdown from sending radioactive debris into the sea below." If this method is available to protect against meltdowns at sea, should/could it not be used likewise as a further containment measure at PNPP? An enhanced margin of safety is what OCRE seeks for its members.

We agree with applicant that the appearance of a newspaper article does not in and of itself create cause for late filing under the criteria set forth in §2.714. The information reflected in the cited article is not new. The idea of a core catcher is more than a decade old. *Consolidated Edison Co. of N.Y. (Indian Point Station Unit No. 2)*, LBP-72-16, 5 AEC 43, 52 (1971). The idea of using the core catcher for the floating nuclear plant was included in the draft Final Environmental Statement (Part III) issued in May 1978.

We agree with applicant that permitting a newspaper article, reflecting information widely available previously, to be good cause for late filing would virtually wipe out the requirement of cause. This is unlike the appearance of a scholarly article containing new analysis.

However, failure to show good cause is not OCRE's only deficiency related to late filing. By relying on a newspaper article without any further research and by failing to raise any specific issues concerning the plans for Perry, OCRE has failed to provide a basis for believing that the core catcher is needed at Perry or that OCRE has any special competence to pursue this issue. Furthermore, OCRE does not indicate why the rulemaking on degraded core issues is not satisfactory as a forum for its concerns.

Consequently, after balancing the factors related to late filing, we conclude that the applicable criteria have not been met. (We need not decide whether the criteria governing the Emergency Core Cooling System necessarily exclude this contention, which OCRE relates to the sufficiency of the containment.)

Because of its concern with this issue, OCRE should be informed of the issuance of John L. Darby (Sandia National Laboratories) *A Review of the Applicability of Core Retention Concepts to Light Water Reactor Containments* (NUREG/CR-2155, September 1981). That NUREG/CR has no official standing in this proceeding. Furthermore, its conclusions appear to be adverse to OCRE's contention. However, if OCRE can revise its contention and meet the criteria for late filing based on a careful, scholarly review of the analysis in that document, it may wish to move for the admission of a new, substantially revised contention on this subject. While repetitive late filing on the same subject are not encouraged, we might choose not to exclude a contention which demonstrated, based on an understanding of the Perry Plant and of available technical information, that a serious safety problem exists which could be effectively ameliorated by some practicable form of core catcher. *See also* Proposed Policy Statement on Safety Goals for Nuclear Power Plants (February 11, 1982), *slip op.* at 13 ("the Commission also recognizes the importance of mitigating the consequences of a core-melt accident").

OCRE may be able to raise this issue in an appropriately drafted petition to the Director of Nuclear Reactor Regulation pursuant to 10 CFR §2.206.

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is this 26th day of February, 1982,

ORDERED

The motions filed on November 21, 1981, by Ohio Citizens for Responsible Energy concerning the admission of its contentions #15 and #16 are denied. This is an interlocutory order that is not subject to appeal.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Block, Chairman
ADMINISTRATIVE JUDGE**

**Jerry R. Kline
ADMINISTRATIVE JUDGE**

**Frederick J. Shon
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Peter B. Block, Chairman
Jerry R. Kline
Hugh C. Paxton

In the Matter of

Docket Nos. 50-266-OLA
50-301-OLA

**WISCONSIN ELECTRIC POWER
COMPANY**
(Point Beach Nuclear Plant,
Units 1 and 2)

February 26, 1982

A Board decision whether or not to withhold from the public a portion of its record pursuant to a proposal that the information be treated as confidential does not create a *sua sponte* issue requiring formal notification of the Commission.

RULES OF PRACTICE: *SUA SPONTE*

Boards have the authority pursuant to 10 CFR §2.718 to regulate a hearing in a "fair and impartial" manner. They are authorized, pursuant to this authority, to consider whether or not it is appropriate to withhold a portion of their record from the public pursuant to a proposal that the information be treated as proprietary. Exercise of this authority does not give rise to a *sua sponte* issue requiring notification of the Commission.

RULES OF PRACTICE: *SUA SPONTE*

When a Board has already completed action on a procedural matter and no further obligation has been imposed on a party, it is not appropriate to notify the Commission of the initiation of a *sua sponte* matter. Such a notification would not avoid delay or serve any other

purpose of the Commission's rule that it be notified of the pendency of a *sua sponte* issue.

RULES OF PRACTICE: *SUA SPONTE*

Board questions related to admitted contentions do not create *sua sponte* matters requiring notification of the Commission. That the Board gives advance notification to a party that related questions may be asked does not convert those questions into *sua sponte* issues requiring notification of the Commission.

MEMORANDUM AND ORDER Operating Licensing Amendment (Concerning a Motion to Certify a *Sua Sponte* Question)

On February 23, 1982, Westinghouse Electric Corporation (Westinghouse), appearing specially to protect allegedly proprietary information from disclosure, requested the Board to certify to the Commission its determination with respect to an allegedly *sua sponte* matter. This motion is a reincarnation of arguments previously rejected by us. LBP-81-62, 14 NRC 1747 (1981) and LBP-82-5A (reconsideration), 15 NRC 216 (1982).

Although our grounds for decision in these earlier rulings were somewhat attenuated by LBP-82-6, 15 NRC 281, 288 (1982), we continue to believe that confidentiality issues do not fall within the scope of the *sua sponte* limitation found in 10 CFR §2.760a. That section discusses the kinds of substantive issues properly considered by a Licensing Board in its initial decision, which has the principal purpose of deciding the substantive issues in a case and generally does not restate every procedural ruling made along the way.

Section 2.760a should be interpreted together with §2.718, which provides the authority to regulate the hearing in a "fair and impartial" manner. Furthermore, that authority should be interpreted in light of the Commission's policy to withhold information from the public only after balancing "legitimate concerns for the protection of competitive positions" against "the right of the public to be fully apprised." 10 CFR §2.790(b) (2). In addition, §2.790(e) gives licensing boards the authority to rule on "proposals" of Confidentiality. It would appear that the submitter is the moving party and the Board rules on the proposal. Section 2.790 can be interpreted to make the Board responsible for ruling on "proposals" although this responsibility is not clearly imposed.

Texas Utilities Generating Company, et al. (Comanche Peak Steam Electric Station, Units 1 and 2), CLI-81-36, 14 NRC 1111 (1981), cited to

us by Westinghouse, is not apposite. In that case, a Licensing Board sought to retain jurisdiction over contentions submitted to it by a party that had withdrawn from the case. It adopted that course without justifying its exercise of *sua sponte* authority. A consequence of its action was a continuing role in supervising staff action with respect to those issues even though the issues had not been determined to be important substantive issues.

In this case, our use of procedural authority has been limited to an order that one passage of one document should be released to the public. The passage will not be released until after Westinghouse has an opportunity to appeal our order. Furthermore, our determination with respect to this issue is over and done with. To certify the issue to the Commission would not conserve Westinghouse's resources. No further effort by Westinghouse with respect to our ruling is called for. The issue can be fully raised on appeal.

To bother the Commission with this matter now is far from the intent embodied in the *sua sponte* rule. That rule is designed to prevent Boards from pursuing "important" safety or environmental issues which the Commission might later decide were not so important. The rule did not intend to affect the Board's authority to conduct a fair and impartial hearing, open to public scrutiny. (We note, as well, that our decisions on this matter have been published and could have been reviewed by the Appeal Board *sua sponte* if it chose.)

To be sure, our interest in the public's right to know is a continuing interest and goes beyond the single passage of the Wiesemann Affidavit on which we have already ruled. We have announced that our inquiries in the hearing scheduled for March 10, 1982, could extend beyond the specific matters raised by intervenor. LBP-82-6, 15 NRC 287-88 (1982).

Following our previously explained logic, we consider ourselves authorized to explore confidentiality issues even beyond those raised by an intervenor. We also believe that even were our concern substantive rather than procedural, Board inquiries within the general scope of matters already raised by an intervenor are wholly appropriate and are not affected by the *sua sponte* restriction. That rule is intended to preclude major, substantive inquiries not related to the subject matter already before a Board. If the subject matter is already before the Board, a Board is not expected to adjourn a hearing before asking questions that extend somewhat beyond the strict limits of an intervenor's inquiries. When, as in this case, a Board can anticipate the likelihood that some such inquiries may be made, it is to the party's advantage that the Board has chosen to indicate the extent to which its questions may go beyond those of the intervenor. Advance notification of an authorized practice does not convert that practice into a *sua sponte* consideration, particularly since the actual

exercise of such authority is entirely speculative and will depend on the course of the hearing.

One purpose of the *sua sponte* rule is to avoid unnecessary delay. Obviously, our ruling has imposed some additional burden on Westinghouse (and, to a lesser extent, on Wisconsin Electric Company). However, this proceeding has not been delayed by our interest in the procedural question of the public's right to know. Like most procedural questions (even those requiring evidentiary determinations), our inquiry is less complex than if we had taken up a potentially serious safety matter. Furthermore, we have managed to consider these questions without any delay in the underlying case. Consequently, application of the *sua sponte* rule to this case would not serve the Commission's principal purpose in adopting the rule: avoiding unnecessary delay.

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is this 26th day of February, 1982,

ORDERED

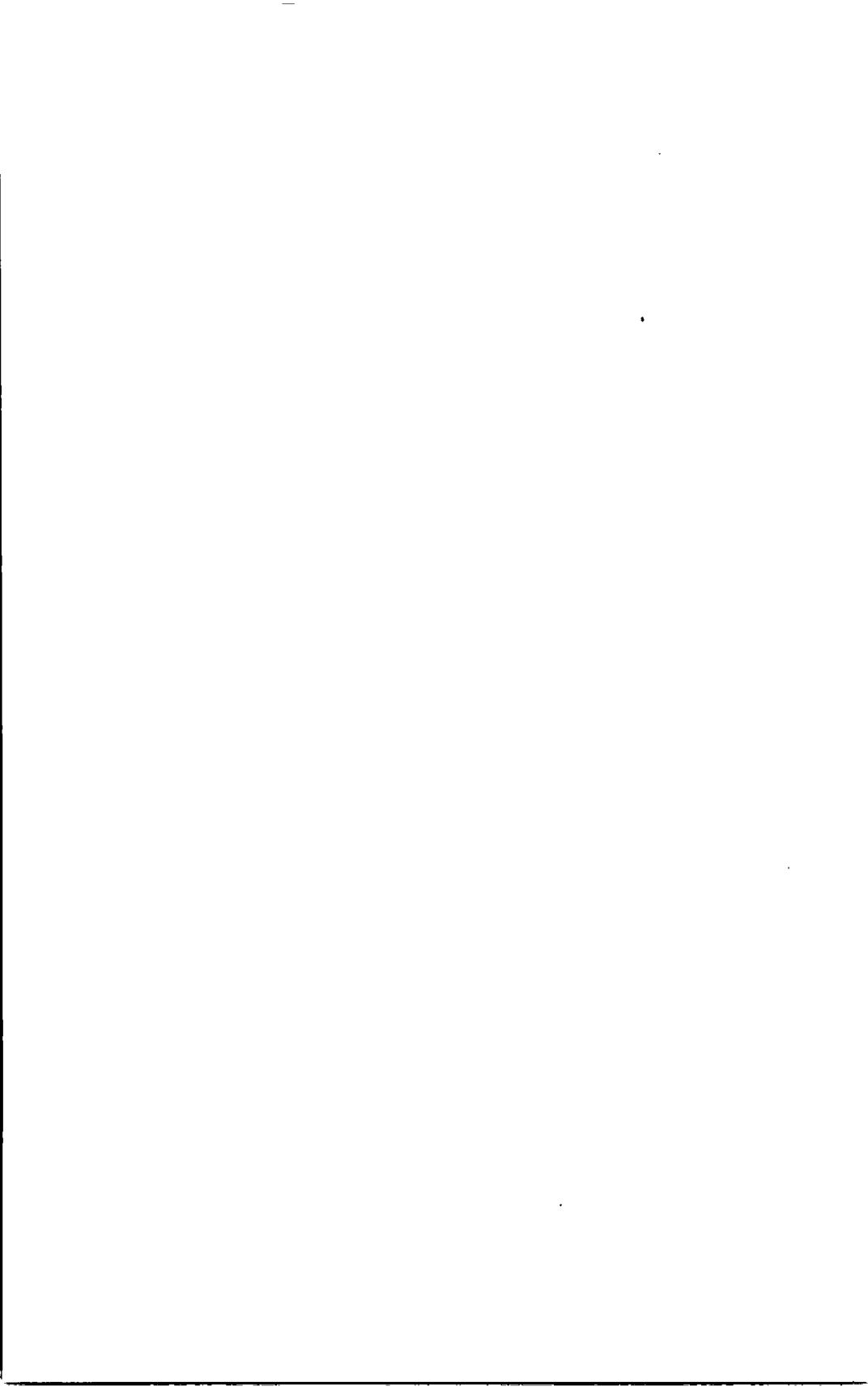
(1) Westinghouse Electric Corporation's Motion to Certify Sua Sponte Question to Commission is denied.

(2) This is an interlocutory order that is not subject to appeal.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE

Bethesda, Maryland



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION:

COMMISSIONERS:

Nunzio J. Palladino, Chairman
Victor Gilinsky
Peter A. Bradford
John F. Ahearne
Thomas M. Roberts

In the Matter of

**PROTECTION OF UNCLASSIFIED
SAFEGUARDS INFORMATION
(10 CFR Parts 2, 50, 70 and
73)
(45 FR 85459)**

March 2, 1982

The Commission denies a petition requesting reconsideration of rules issued pursuant to Section 147 of the Atomic Energy Act (46 *Fed. Reg.* 51718 (October 22, 1981)), and immediate suspension of two of them — one prohibiting the unprotected telecommunications of safeguards information except in emergency situations and the other mandating the use of a GSA approved security container for the storage of such information in areas that do not have protected or controlled access. The Commission rejects petitioners' claim that the new rules will require the purchase of "secure" communication equipment or GSA approved containers and explains how the rules requirements can generally be met without the use of such equipment.

ORDER

Background

On the sixtieth day after the Nuclear Regulatory Commission's adoption and entry of final rules governing protections for safeguards information pursuant to section 147 of the Atomic Energy Act of 1954 as

amended,¹ KMC and the Physical Security Coordinating Group (Petitioners), through their attorney Jay E. Silberg, wrote a petition to the Commission requesting reconsideration of those rules and immediate suspension of two of them. In support of their petition they have presented in the main the same allegations and arguments with which they opposed the proposed rule, and which the Commission has already considered and rejected.² Thus, the Commission finds that no basis has been provided that warrants reconsideration or suspension of the subject rules.³

Because petitioners appear to misunderstand what these rules entail, we take this opportunity to discuss briefly the two regulations sought to be suspended — the one prohibiting unprotected telecommunications, the other mandating various storage requirements.

The Commission has prohibited the use of unprotected telecommunication circuits for Safeguards Information except under emergency or extraordinary circumstances in recognition of the ease of accomplishing an interception and the difficulty or impossibility of detection when information has been compromised by such a tap. Nonetheless, it is our view that this rule will not require the purchase of "secure" communication equipment. Routine communications may be mailed, for example, and there is an exemption for emergencies. Moreover, routine security related transmissions between on-site guard forces or alarm stations can easily be limited to code formats or cryptic language, and discussions of an isolated element taken out of context can be couched in terms that effectively eliminate the identity of any Safeguards Information and therefore would be allowed on commercial telephone. Our own staff has concluded that this restriction will not impede their review of power reactor security plans and has no intention of installing protected circuits to licensed facilities. It is notable that one of the NRC licensed fuel facilities has had a *classified* security plan for many years — subject to a bar against unsecured transmissions — and never found the need for either secure or protected communicating circuits either on or off site.

¹ See 46 Fed. Reg. 51718 (1981).

² A somewhat different legal argument was proffered with respect to the issue whether the Commission has authority to prohibit disclosure of generic studies. The argument was based on an erroneous statement of the legislative history of section 147. Petitioners apparently failed to recognize that the original House Bill H.R. 2608 which authorized nondisclosure protections for generic studies was amended by a later bill, H.R. 5297, which omitted that protection and that the version sent by the House to conference therefore omitted the protection. Thus although petitioners are correct that the Conference Report notes that there was no change to the House version, that fact lends support to their thesis. The plain language of Section 147, the Conference Report and the legislative history indicate that the Commission has not the authority to do as petitioners request.

³ In view of this disposition, the Commission does not decide whether the petition is a timely request for reconsideration or whether it is more properly treated as a request for rulemaking.

Petitioners complain that the Commission has required a GSA approved security container for areas that do not have protected or controlled access and ask for a change in the regulations to allow the use at any location of the steel filing cabinets now permitted in protected or controlled access areas. They assert that the Commission believes both the steel containers and the filing cabinets afford equivalent protection quoting as support the Commission's statement in the Supplementary Information that "both satisfy this objective [to make more difficult undiscovered compromise of Safeguards Information]".

The Commission believes that each satisfies that objective in the location for which it is required. Because with free access and unlimited time the filing cabinet might more easily be compromised without leaving a trace, it would not satisfy the objective in areas to which access is not controlled. In actuality, however, GSA approved security containers appear to be required only in uncontrolled areas such as might exist at a power reactor construction site. It appears that "in many cases corporation headquarters or other office buildings will qualify as controlled access areas provided they are attended around the clock *or locked at night.*" NUREG-0794 at 5, emphasis provided. We are informed by our staff that after numerous conversations with affected licensees and individuals, they have yet to identify a situation positively requiring the use of a GSA approved storage container. Thus it does not appear that petitioners are adversely affected by this rule. Commissioner Roberts disapproved this Order.

Conclusion

For the foregoing reasons, the petition is DENIED.

For the Commission*

SAMUEL J. CHILK
Secretary of the Commission

Dated at Washington, D.C.
the 2nd day of March, 1982.

* Commissioner Ahearne was not present when this Order was affirmed. Had Commissioner Ahearne been present he would have affirmed the Order.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Nunzio J. Palladino, Chairman
Victor Gilinsky
Peter A. Bradford
John F. Ahearne
Thomas M. Roberts

In the Matter of

Docket No. 50-537
(exemption request
under 10 CFR 50.12)

UNITED STATES DEPARTMENT OF
ENERGY
PROJECT MANAGEMENT
CORPORATION
TENNESSEE VALLEY
AUTHORITY
(Clinch River Breeder Reactor
Plant)

March 16, 1982

The Commission denies the Department of Energy's request for an exemption under 10 CFR 50.12 for authority to conduct site preparation activities for the Clinch River Breeder Reactor prior to the issuance of a construction permit or Limited Work Authorization.

ORDER

On November 30, 1981 DOE, for itself and on behalf of its co-applicants Project Management Corporation and the Tennessee Valley Authority (Applicants), requested an exemption from 10 CFR 50.10 pursuant to 10 CFR 50.12 to conduct site preparation activities for the Clinch River Breeder Reactor (CRBR) prior to the issuance of a construction permit or limited work authorization. The scope of those proposed activities is described in the Commission's Memorandum and Order of December 24, 1981 in which the Commission established the informal procedures for considering this request. 14 NRC 1100, CLI-81-35 (1981). Grant of the exemption was opposed by the Natural Resources Defense Council, Inc.

and the Sierra Club (Intervenors) who are intervenors in the now reopened proceeding for a construction permit for CRBR. After receiving comments on the exemption request from Applicants, Intervenors, and several other persons, the Commission conducted an oral presentation on February 16, 1982. Subsequently, in the early part of March, the Commission conducted two public meetings to discuss the exemption request. The Commission has decided to deny the request.

Chairman Palladino and Commissioner Roberts dissent and would have granted the exemption.

Individual Commissioners' views are attached.

It is so ORDERED.

For the Commission

SAMUEL J. CHILK
Secretary of the Commission

Dated at Washington, D.C.
this 16th day of March, 1982.

**COMMISSIONER GILINSKY'S SEPARATE VIEWS ON DOE'S
EXEMPTION REQUEST FOR THE
CLINCH RIVER BREEDER REACTOR**

I have voted against granting the Clinch River Breeder Reactor an exemption from NRC's licensing regulations to permit early site work because I am not persuaded that such an exemption would be in the public interest.

Background

The Clinch River reactor is subject by law to NRC licensing. Normally, a utility cannot begin site preparation and excavation until it has received a Construction Permit ("CP") after satisfactory resolution of all environmental and safety issues. The NRC's regulations, however, do provide that an applicant may be granted an exemption, known as a Limited Work Authorization 1 ("LWA 1"), from this requirement if the Licensing Board has made all the environmental findings required at the CP stage and has made a preliminary safety finding that the site is suitable.¹

¹10 CFR 50.10.

The Department of Energy ("DOE") is eager to obtain the benefit of this exemption so that it may break ground as soon as possible. But given the state of the licensing proceeding, it does not appear that the Clinch River project will be eligible for an LWA 1 until sometime in 1983. In these circumstances, DOE has asked the Commission for a further relaxation of licensing requirements, under section 50.12 of our regulations, to enable it to begin site preparation now, roughly a year before it can satisfy the requirements for an LWA 1.² DOE has, in effect, asked for an exemption on top of an exemption. If the section 50.12 exemption request presently before the Commission is granted, DOE apparently intends to apply as soon as it can for an LWA 2 which, if granted, would permit additional work to be performed in advance of receipt of a Construction Permit.³

I will pass over two preliminary legal questions: whether section 50.12 of our regulations, which sets out the standards for granting the exemption in question, is in fact applicable to a one-of-a-kind research reactor which will as an incidental matter produce power; and, whether section 50.12 is consistent with the provisions of the National Environmental Policy Act.⁴ The answers are unclear, and will presumably be provided by the courts in due time. For the purposes of this decision I will assume that the Commission can grant an exemption if that is in the public interest. As I stated at the outset, I do not believe it is.

² 10 CFR 50.12 governs the grant of an exemption from the requirements of 10 CFR Part 50. The Commission may grant an exemption if it finds that the exemption is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest. Section 50.12(b) prescribes that, in deciding whether to permit construction prior to the issuance of a construction permit, the Commission will consider and balance: (1) whether the construction will have a significant adverse impact on the environment; (2) whether any adverse impact can reasonably be redressed; (3) whether the construction would foreclose the subsequent adoption of alternatives; and, (4) the effect of delay on the public interest, including the need for the power to be generated by the proposed facility, the availability of alternate sources of energy, and the cost of delay to the applicant and to consumers.

³ DOE presently seeks permission to clear and grade the site, build access roads and construction facilities, and excavate the reactor's foundations. These are the type of activities normally permitted under an LWA 1. The installation of structural foundations prior to the issuance of the construction permit normally requires the issuance of an LWA 2. This requires the Licensing Board to find that the requirements of an LWA 1 have been satisfied and that there are no unresolved safety issues, that would constitute good cause for not allowing the activities proposed under the LWA 2 to proceed.

DOE expects that beginning site preparation in 1982 will enable construction to be completed one year earlier than if site preparation were to begin in 1983.

⁴ 42 U.S.C. 4321 *et seq.*

Effect of an Exemption on NRC and Power Reactor Safety

The source of my concern is that granting the section 50.12 exemption would be the first step in placing Clinch River on a fast track within the NRC license review process.⁵ Such high-priority, fast-track treatment for Clinch River is bound to impact licensing and safety supervision of the power reactors which constitute our principal responsibility.

The Clinch River reactor involves a new technology for which there is no established body of NRC safety criteria. These need to be developed while the safety review is being performed. If this work is to be done properly, it will inevitably make substantial demands on the limited resources and skills of the NRC. In view of the budgetary situation this agency's resources are tight. If Clinch River is placed on a fast track, other projects will likely have to be put on a slow track.

For most of last year, licensing schedule projections seemed to suggest that NRC would not complete power plant license reviews for a number of power plants before their construction was finished and they were ready to operate. It now appears that these fears were exaggerated. We have managed to gain control of these licensing schedules and we are now working apace with plant construction. However, we do not have a wide margin for dealing with unplanned contingencies. Moreover, in order to accelerate our licensing reviews, we have been forced to delay the resolution of a number of safety issues. Any resources which are freed by slowdowns in reactor construction schedules should be devoted to resolving these issues, which affect the protection of this country's \$100-200 billion investment in light water power reactors, rather than to accelerating the breeder's licensing.⁶

While the President and Congress have urged us to deal expeditiously with both the breeder and light water reactors, there has not been any suggestion, of which I am aware, that the interests of the latter should be sacrificed in favor of the former. Such a suggestion would in fact be extremely unfortunate. Our predecessor agency was often distracted from

⁵ There is a view that nothing of the sort is involved here, and that we have only to deal with an isolated exemption. This used to be called salami tactics. The modern name is segmentation of decisionmaking.

⁶ I am aware that the NRC staff recently informed the Commission that speeding up Clinch River licensing would not require much additional effort. This does not relieve my concern over resources; the staff estimate is implausible unless the Clinch River review and the development of its licensing criteria are to be superficial affairs. If anything, the staff estimate heightens my concern about how the staff would interpret a Commission decision to authorize a speedup in the Clinch River licensing schedule.

the pressing safety and waste problems of the light water power reactors by the demands of the breeder reactor. This has proven to be an expensive mistake.

It is also interesting that the Edison Electric Institute, in its testimony at our hearing in support of the exemption request, was not prepared to recommend that licensing the breeder should take precedence over the licensing of its member utilities' light water power plants.

The issue, let me reiterate, is not whether the NRC will undertake the Clinch River review, but whether NRC will conduct it at a pace which is unnecessarily harmful to NRC's other responsibilities.

Applicant's Claim that Exemption Will Reduce Costs

Set against these concerns are the applicant's claims that substantial benefits will result from speeding up this project.

There is presumably some advantage in having a year earlier the information which the project is supposed to generate. The gain is intangible, and no persuasive argument was presented that it would be substantial. Whatever the economic incentives once were for developing breeder reactors, they are much diminished. Breeders, which compensate for their expense by conserving uranium, were economically interesting when uranium was thought to be scarce and large numbers of conventional reactors were expected to use it up quickly. But uranium supplies are plentiful and increasing, while the projections for the number of reactors to be installed have been sharply deflated. The chief problem in the uranium market is not finding uranium but coping with falling prices.

The applicant has also argued that, quite apart from any research benefits, substantial economic savings will result from an earlier start of construction. In its initial presentation, DOE asserted that a one year gain in the construction schedule would result in savings of \$120-240 million.⁷ When asked to justify these assertions, DOE submitted an analysis⁸ which, as was pointed out by one of the parties to the proceeding, failed to consider the time-value of money and, as a consequence, did not suitably discount future expenditures. When this was done properly, the gains which DOE claimed for rapid completion of the project effectively vanished.

⁷ Letter from Secretary Edwards to NRC Chairman Palladino, November 30, 1981.

⁸ Letter from Deputy Assistant Secretary Chipman to NRC Chairman Palladino, December 31, 1981.

DOE then tried to revive its conclusion with an argument which purported to demonstrate that there would be a difference in the cost attributable to *past* expenditures depending upon whether or not the site preparation exemption were granted.⁹ Both the Deputy Secretary and the applicant's expert witness, Arthur Andersen & Co., attempted to defend this argument at the hearing before the Commission. Needless to say, this proposition is wrong. It also contradicts the analysis of an almost identical problem, the cost of delays in licensing commercial power plants, done by DOE for the House Appropriations Committee.¹⁰ That analysis correctly recognized that sunk costs cannot affect the choice among future alternatives. In other words, while it is valid to assign an interest charge to past expenditures, that charge is the same for all future options and therefore drops out of any cost comparison among them. What matters for choosing among future alternatives are *future* benefits and *future* costs.

In response to criticisms made at the hearing, DOE and Arthur Andersen filed additional written statements with the Commission. DOE conceded that from "the economic or resource perspective" interest on past expenditures is not a factor to be considered in deciding between the costs of future options.¹¹ In spite of this, the Deputy Secretary persisted in presenting a "financial cost" analysis which is the same incorrect analysis DOE originally put forward. DOE thus lists \$190 million in interest on past expenditures as the principal cost of not granting the exemption.¹²

⁹ DOE submission to the Chairman, "Re: Clinch River Breeder Reactor Plant", January 28, 1982.

¹⁰ In its report, DOE states that "the monthly carrying costs of the completed units . . . would be incurred even if the units operated and are therefore *not* part of the direct costs of the delay." DOE went on to explain that "any cost that would be incurred with or without the delay does not affect this cost differential and is therefore *not* part of the cost of the delay." See letter of April 14, 1981, from Richard E. Weiner, Director, Division of Power Supply Reliability, Office of Utility Systems, Economic Regulatory Agency to Darrell G. Eisenhut, Director, Division of Licensing, Office of Nuclear Reactor Regulation, Nuclear Regulatory Commission.

At the hearing, the Commission asked the Deputy Secretary to provide it with the Economic Regulatory Agency's views on DOE's method of calculating the gains to be realized by granting the section 50.12 exemption. DOE's written response states that DOE no longer provides cost analyses to the House Appropriations Committee and that in view of "recent reorganizations within the Department, the Office of Policy, Planning and Analysis is the organization with the relevant responsibility and expertise for this review." Letter from Deputy Secretary Davis to the Commission, "Re: Clinch River Breeder Reactor Plant", February 25, 1982.

¹¹ Letter from Deputy Secretary Davis to the Commission, "Re: Clinch River Breeder Reactor Plant", February 25, 1982, p. 3.

¹² *Ibid.*, p. 5.

The \$190 million figure comes from Arthur Andersen's conclusion that "In the event of a *one-year delay* in the construction of Clinch River, *interest* will be incurred *for one extra year*."¹³

Arthur Andersen's error lies in comparing project costs measured in dollars of two different years, the accelerated project's costs being measured in dollars of one year and the unaccelerated project's costs measured in dollars of the following year. When a correction has been made to measure the costs in dollars of a common reference year, (which can be any year) the conclusion of every example presented by Arthur Andersen is reversed.¹⁴

The conceptual difficulty seems to stem from overlooking the fact that the accounting convention for the cost of a project produces a result in dollars of the year of completion. An economic comparison between projects, however, must be made in dollars of a common reference year.

The error is a common one. As a standard textbook on engineering economy puts it, although the principle that a decision made now necessarily deals with the future is simple enough,

"... many people have difficulty in accepting the logical implications of the principle when they make decisions between alternatives. This seems particularly true when sunk costs are involved. Although some of the failures to recognize the irrelevance of sunk costs involve a misuse of accounting figures, these mental obstacles to clear reasoning are by no means restricted to people who have had contact with the principles and methods of accounting."¹⁵

When interest on past expenditures has been eliminated from the calculation of the cost of not granting this exemption, three items remain: a management charge of about \$40 million, a \$20 million charge for (discounted) deferred revenue, and a negative figure which reflects the

¹³ Letter from Arthur Andersen & Co. to the Commission, February 23, 1982, p. 3.

¹⁴ Arthur Andersen submitted the attached chart (*see* p. 372) which purports to demonstrate that completing the illustrative project one year earlier will result in a savings of \$563 million in the overall project cost. As can readily be seen from the chart, however, the cost of the accelerated project is measured in 1994 dollars while that of the unaccelerated project is measured in 1995 dollars.

If the cost of the accelerated project is measured in 1995 dollars, using Arthur Andersen's assumption of an 11% rate of interest, the cost of the project is \$8,903 million (\$8,021 plus 11%). This cost is \$317 million greater than the cost of the \$8,584 million cost of the unaccelerated project (also measured in 1995 dollars).

¹⁵ Eugene L. Grant, W. Grant Ireson, *Principles of Engineering Economy*, New York, 1970, p. 315.

discounting of future expenditures. The sum of these figures, in the example presented by DOE, yields \$28 million as the cost of not granting the exemption.

Lest anyone look to the \$28 million to tip the balance toward an exemption, it should be noted that the figure is an arbitrary one, based on the artificially low discount rate assumed by DOE.¹⁶ If a more realistic discount rate were employed, the cost might well be zero or, more likely, might become a benefit.¹⁷ In any case, the uncertainty in the analysis is larger than the result.

In sum, no compelling argument has been made, on the basis of the cost estimates provided by the applicants, for the proposition that granting this exemption would serve the public interest by significantly lowering the cost of the Clinch River project.

Putting Clinch River on a Fast Track

Should Congress, nevertheless, want this reactor to be built earlier than contemplated by the licensing schedule, it would be best for Congress to exempt Clinch River from NRC licensing altogether. If NRC could easily accommodate an accelerated review, I would come to a different conclusion. However, it cannot. I am concerned not only about the impact of a fast track breeder licensing review on NRC's other responsibilities, but also about the quality of NRC's work if there is heavy pressure to accelerate the review. Even if this project were exempt from licensing, the NRC could still conduct a safety review, on the same "best efforts" basis as it performs other reviews for DOE.

To exempt Clinch River entirely from licensing may seem at odds with one of the original goals of this program — to demonstrate the licensability of a breeder reactor — but that goal is no longer as important as it once was. Such a demonstration was important when the CRBR was thought to be the prototype for dozens of commercial breeder power plants which were to follow on its heels. It now seems unlikely that there will be any commercial breeder plants in the United States for decades. And, even if breeders are built in the distant future, it is doubtful that the standards applied to this plant will be a satisfactory model for the later plants.

¹⁶ DOE has assumed an inflation rate of 8% and interest rate of 11%. These assumptions result in an effective discount rate of 3% and, in this case a saving of approximately \$30 million.

¹⁷ I would also note that DOE initially valued the deferred power output of Clinch River at \$6 million per year but that it has revised this estimate to \$10-20 million. There does not seem much point in quibbling, however, about this figure.

CHART SUBMITTED BY ARTHUR ANDERSEN (SEE FOOTNOTE 14)
ILLUSTRATION OF THE COST OF A ONE YEAR DELAY IN 1981

Year	No Delay (Millions)			One Year Delay (Millions)			Carrying Cost Increase (Decrease)
	Yearly Investment	Carrying Cost	Total Cost	Yearly Investment	Carrying Cost	Total Cost	
1974	\$100	\$ 11	\$ 111	\$100	\$ 11	\$ 111	\$.
1975	100	23	234	100	23	234	.
1976	100	37	371	100	37	371	.
1977	100	52	523	100	52	523	.
1978	100	68	691	100	68	691	.
1979	100	87	878	100	87	878	.
1980	100	108	1,086	100	108	1,086	.
1981	100	130	1,316	100	130	1,316	.
1982	100	156	1,572	.	145	1,461	(11)
1983	100	184	1,856	100	172	1,733	(12)
1984	100	215	2,171	100	202	2,035	(13)
1985	100	250	2,521	100	235	2,370	(15)
1986	100	288	2,909	100	272	2,742	(16)
1987	100	331	3,340	100	313	3,155	(18)
1988	100	379	3,819	100	358	3,613	(21)
1989	100	431	4,350	100	408	4,121	(23)
1990	100	490	4,940	100	464	4,685	(26)
1991	100	554	5,594	100	526	5,311	(28)
1992	100	626	6,320	100	595	6,006	(31)
1993	100	706	7,126	100	672	6,778	(34)
1994	100	795	8,021	100	756	7,634	(39)
1995	.	.	.	100	850	8,584	850
Total			\$8,021			\$8,584	\$563

The \$563 million cumulative cost that would be incurred as a result of a one-year delay represents the future value of the \$145 million cost during the year of delay. It is based on the delay being a full year, the succeeding construction period being 13 years and an interest rate of 11%.

COMMISSIONER BRADFORD'S SEPARATE VIEWS ON CLINCH RIVER

I have only a little to add to the views of Commissioners Gilinsky and Ahearne. I agree in general with the points that they have made and concur specifically in Commissioner Gilinsky's discussion of delay costs¹ and in the latter part of Commissioner Ahearne's discussion of the DOE analysis.² In particular, I see nothing useful to be had from DOE's attempt to calculate costs three different ways.³ The economic costs are what matters, and the Commission majority is in agreement that they do not exceed \$28 million using the implausibly low DOE discount rate.

As Commissioner Gilinsky has noted, a more realistic discount rate would show a net benefit from not accelerating this project. Indeed, there is likely always to be a net benefit from deferring a project unless the discounted value of its operation is sufficient to tip the balance the other way. With Clinch River, the value of accelerating the operation is non-existent. The benefits from its operation occur only when a scarcity of uranium drives the cost of conventional reactor fuel above the cost of reprocessed plutonium. Since that event now does not seem at all likely in this century (a proposition not challenged by DOE or industry witnesses or Commissioners Palladino and Roberts), there is no economic benefit to be assigned to having the Clinch River Breeder in 1988 rather than 1989.

. . .

I agree in general with Commissioner Ahearne's analysis of the non-economic factors although I do not attach much significance to the history of Section 50.12. Specifically, I agree that the Commission could grant the exemption consistently with Section 50.12.⁴ I agree also that nothing in the first three factors under 50.12 appears to preclude the exemption. However, the exemption is emphatically not in the public interest. The economic dimension of the public interest test has been covered. All that remains is a discussion of the implications for the NRC licensing process.

One must start with the realization that the "normal" licensing process defines the public interest as the NRC has come to view it over three

¹ Gilinsky opinion, pp. 368-71.

² Ahearne opinion, pp. 395-99.

³ Letter from Deputy Secretary Davis to the Commission, "Re: Clinch River Breeder Reactor Plant," February 25, 1982.

⁴ Whether such an action would contravene NEPA is less clear. The segmentation question and the foreclosure of alternative points are substantial and would need more careful refutation than they receive in the opinions favoring the exemption. This point is especially important because it is hard to see how the Commission could be keeping an open mind on the NEPA issues while finding that the public interest requires accelerated completion of the project at Clinch River.

decades. During this time it has licensed nearly half of the free world's nuclear generating capacity without any delay of completed plants and with minimal delay of any sort. Consequently, special exemptions are not lightly given, especially to one-of-a-kind reactors.

The difficulty with special exemptions that go beyond the Limited Work Authorization procedures is that they slice applications into inscrutable segments. Bit by bit, plants get built, with their full implications unreviewed until completion. As the economic commitment grows, the safety and environmental reviews are inevitably subject to increasing economic pressure.⁵ For all of the Commission's past protestations to the effect that the work is done at the risk of the applicant, this has rarely been completely true and is in any case unpersuasive when the applicant is government funded to so great an extent.

The issue here is not licensability. It is whether anything about this project merits the kind of special treatment that a shortcircuiting of our Limited Work Authorization procedures would involve. The Commission's most tangled and costly proceedings (Seabrook and Diablo Canyon) have come when it has allowed substantial investment prior to completion of difficult licensing reviews. In a recent case, the Court of Appeals⁶ declined to allow the NRC to postpone hearing a significant safety issue until after the plant was built.

These cases are not specifically analogous to this exemption request, but they serve to illustrate the broader point about the unwisdom of piling large sunk costs on the licensing process unnecessarily. While it appears that the environmental issues here are clearcut, the Commission should not go by appearances untested in hearings absent compelling circumstances. The NRC has been surprised before, and the allowing of increasing economic commitment to a project before the record merits a Limited Work Authorization is in itself contrary to the public interest.

SEPARATE VIEWS OF COMMISSIONER AHEARNE

SUMMARY

The Department of Energy (DOE) has requested an exemption under 10 CFR 50.12 in order to begin site preparation for the Clinch River

⁵ As Justices Black and Douglas observed in their dissent in the only previous breeder licensing case, the ill-fated Fermi I plant, ". . . when millions have been invested, the momentum is on the side of the applicant, not on the side of the public. The momentum is not only generated by the desire to salvage an investment. No agency wants to be the architect of a white elephant." *Power Reactor Development Co. v. Electrical Union*, 367 U.S. 396, 417 (1961).

⁶ *State of Illinois v. NRC*, No. 80-1163, July 1, 1981, unpublished opinion.

Breeder Reactor (CRBR). In addressing this request, I conclude it is not for the NRC to address (1) the need for an LMFBR program or for a demonstration scale facility or (2) the total cost of the CRBR.

Section 50.12 has a long history. A version of 50.12(a) authorizing specific exemptions has been in existence for over 20 years. When the Atomic Energy Commission (AEC) modified its regulations in 1972 to place restrictions on site preparation activities because of its new National Environmental Policy Act (NEPA) responsibilities, it introduced a version of 50.12(b) to provide a specific method by which applicants could show why work already begun should not be suspended until the AEC did an environmental review.

In 1974 the AEC developed an alternative way to approve site preparation activities prior to issuance of a construction permit — the Limited Work Authorization (LWA). A 50.12 exemption was still an option, but the Commission noted it was to be used “sparingly and only in cases of undue hardship.” Since the LWA provisions became final in 1974, only one 50.12 exemption for site preparation activities has been issued.

I conclude 50.12 can be applied in this case. However, DOE must make a strong showing on the four 50.12(b) factors since 50.12 is to be used only in very unusual circumstances. The factors to be considered are: environmental impact, redressability, foreclosure of alternatives, and public interest.

The NRC staff has concluded the work that would be done under the exemption would have no significant environmental impact, and the local authorities strongly support the request. Nevertheless, site preparation inherently involves some environmental impacts and \$88 million would be spent on project construction. Reasonable restoration is possible, although there may be some potential problems because of funding considerations. No alternative appears to be foreclosed by the proposed work.

Addressing the effect of delay on the public interest, I considered whether there is (1) a Congressional mandate, (2) a need to move ahead on the project for production of power or research and development (R&D) purposes, or (3) a substantial dollar cost to the taxpayer for delay.

After reviewing many letters from Congress and the Congressional legislative history, I conclude there is no mandate to waive—or not to waive—our standard procedures. The project is not being justified by need for power, and Congress has confirmed such a need is not a factor. Since I defer to DOE on the general need for R&D and it has not made that case, R&D needs do not provide a justification for the exemption. Thus the decision rests on the cost. And it is here the applicant presented its worst case.

We have the following DOE estimates for a one-year delay:

- November 30, 1981: \$120 million
- January 18, 1982: (a) \$120 million, "clearly conservative"
(b) \$175 million
- January 28, 1982: (a) \$120 million, "clearly conservative"
(b) \$161 million
(c) \$166 million
(d) \$175 million
- February 25, 1982: (a) \$129 million, "appropriations perspective"
(b) \$ 28 million, "economic perspective"
(c) \$218 million, "financial perspective"

I conclude the DOE has finally agreed that as far as the true dollar cost of delay, it is in the region of \$30 million—coincidentally, about the cost of the management team.

This is sufficiently different from the original estimate as to indicate the DOE paid little attention in preparing its original statement, although the series of estimates does not lead me to have confidence in *any* of the estimates. In the case of a utility applicant we would look with strong disfavor on such rapidly shifting submissions.

Thus, I conclude the DOE has failed to make the public interest case and, in the cost area, badly.

I am also concerned that DOE may not understand the appropriate controls that should be applied when assuming the role of a license applicant. The NRC has high standards for license applicants — which underlie the concept of licensability, which is a CRBR objective. It is because of these standards that showing licensability is an important accomplishment.

Therefore I vote to deny the exemption request.

I. Areas Not Considered

In addressing the request for an exemption from the Department of Energy,¹ there were two issues which I did not consider.

It is not for the NRC to decide the need for a liquid metal fast breeder reactor program or the need for a demonstration scale facility, e.g.,

¹ The request is from the Department of Energy, for itself and the Tennessee Valley Authority and the Project Management Corporation. In this opinion this group is collectively referred to as the applicant or DOE.

whether such is a sound use of tax monies. Determination of these needs, including the timing and objectives, is more properly determined by DOE.² In 1976 the Commission directed:

“that the following be assumed as established by the ERDA impact statement and associated processes:

a. The need for a liquid metal fast breeder reactor program, including its objectives, structure and timing.

b. The need for a demonstration-scale facility to test the feasibility of liquid metal fast breeder reactors when operated as part of the power generation facilities of an electric utility system, including its timing and objectives.³

Thus these needs are to be assumed. Therefore, we should not address such questions as whether and by how much the drop in reactor orders, the reevaluation of uranium resources, and the drop in uranium prices have delayed the need for a demonstration reactor such as the CRBR.⁴ These are not appropriate issues for the NRC. We should defer to DOE.

We also are not estimating the full cost of the CRBR. Considerable debate has taken place over the “true” cost of this project, with much of the debate on how long will it really take to bring a first-of-a-kind machine to successful operation. Although costs of delay are an issue here, the full cost of the project is not.

II. Application of Section 50.12

There are three issues with respect to the use of Section 50.12: (1) can it be used; (2) should it be used; and (3) if so, does consideration of the factors support granting the present request?

The applicant argues that the section is a valid part of the NRC regulations; was consciously retained following introduction of the LWA procedures; that the Atomic Energy Act of 1954 requires that procedures such as this be available for demonstration projects; and, therefore, Section 50.12 is usable in this case. The opponents argue that 50.12 is a vestigial remnant — with little applicability after the 1974 LWA procedures were

² This position mirrors the Commission's earlier decision on whether NEPA required the NRC to address broader environmental issues previously addressed in the ERDA Program Statement. *Project Management Corporation, et al.* (Clinch River Breeder Reactor Plant), CLI-76-13, 4 NRC 67 (1976). The Commission was “guided largely by the ‘rule of reason’ generally applicable to NEPA issues [citation omitted], by the implications of the Energy Reorganization Act and Congressional consideration of the Clinch River project, and by considerations of practicality.” *Id* at 79. I find the Commission's reasoning and guidance persuasive.

³ *Id* at 92.

⁴ *E.g.*, Letter from F. von Hippel to Chairman Palladino (January 13, 1982) (submitted in response to December 24, 1981 NRC invitation for comments on DOE exemption request).

issued, as shown by the fact that virtually all exemptions were issued before the LWA provision was a portion of the regulations; that it was not meant to be used for first-of-a-kind designs; and the contention in the reopened hearing precludes the use of Section 50.12.

Background of Sections 50.12 and 50.10

In 1960 the Commission added a new paragraph to Section 50.10 which provided "No person shall begin construction of a production or utilization facility on a site on which the facility is to be operated until a construction permit has been issued."⁵ The new regulation went on to define construction to include pouring of foundations or installation of any portion of the permanent facility. It explicitly excluded activities such as excavation, and construction of roadways, railroad spurs, and non-nuclear facilities such as turbine buildings and temporary construction buildings. This was not an absolute prohibition. The Commission did grant requests for specific exemptions.⁶ In fact, in 1969 the Commission proposed specific procedures and criteria for issuing exemptions to allow certain categories of activity prior to issuance of a construction permit.⁷ However, this proposal was later withdrawn. The enactment of the National Environmental Policy Act (NEPA) in 1970 caused a significant change in the Commission's approach.

Changes to Reflect NEPA

In response to NEPA, the Commission proposed a rule in 1971⁸, which became final in 1972⁹, to "redefine the 'commencement of construction'" and "provide for Commission environmental review prior to 'commencement of construction.'"¹⁰ Under the new definition of "construction" an applicant could no longer clear land, excavate, build a non-nuclear building, or take other substantial action which would adversely affect the environment. Some activities, such as those reasonably necessary for determining site suitability, were still permitted provided efforts were taken to minimize environmental harm.

In some cases the proposed rule would have affected activities already

⁵ 25 Fed. Reg. 8712 (September 9, 1960).

⁶ At that time the regulations included 50.12, "Specific Exemptions," which is virtually identical to the current 50.12(a).

⁷ 34 Fed. Reg. 2357 (February 19, 1969) (proposed rule to allow exemptions for installation of foundations and below grade walls prior to issuance of construction permit).

⁸ 36 Fed. Reg. 22848 (December 1, 1971).

⁹ 37 Fed. Reg. 5745 (March 21, 1972).

¹⁰ *Id.*

underway. Activities which were no longer authorized but which had been authorized, either at the applicant's option (because they were not covered by the original definition of construction) or by a previously issued specific exemption (under 50.12), were dealt with by the addition of two new sections — 50.10(d) and 50.12(b). In essence, affected applicants were required to show cause why their activities should not be suspended until the Commission had an opportunity to do an environmental review. The Commission reached its decision on the show cause requests by considering and balancing a set of factors. The factors to be considered were virtually identical to the factors listed in the current version of 50.12(b). The proposed rule addressed only transition cases.

The final rule added a footnote to the standard exemption provision, Section 50.12(a), which provided "In acting upon an application for an exemption permitting the conduct of the activities prior to the issuance of a construction permit prohibited by §50.10, the Commission will consider and balance the environmental factors [applicable to the show cause determination as] described in paragraph (b) of this section." The Commission explained:

"In making this relief generally available only to those persons who have commenced actual site preparation activities prior to the effective date of these amendments, the Commission realizes that in individual cases, particularly those instances where plants are in an advanced stage of development, but where no site preparation work has yet been started, undue hardship may be incurred. In those situations, relief may be sought by requesting a specific exemption under §50.12. Although it is expected that specific exemptions will be used only sparingly for this purpose, appropriate relief may be granted in particular cases where the facts so warrant and a favorable determination can be made with respect to the specified environmental considerations listed in the new §50.12(b)."¹¹

Limited Work Authorizations and Section 50.12

In 1974 the Commission introduced a new set of amendments which "would provide for a procedure different from that set forth in §50.12(a) of the Commission's present regulations in 10 CFR 50 whereby site preparation and excavation and certain other on-site activities could be undertaken prior to issuance of a construction permit for a nuclear power reactor."¹² The procedure, a limited work authorization (LWA), differed

¹¹ *Id.* at 5746.

¹² 39 Fed. Reg. 14506 (April 24, 1974).

from an exemption in several important respects. Although the LWA was routinely available, the scope of activities was defined and limited, the staff had to complete its final environmental statement before issuance, and the Licensing Board had to make the required NEPA findings before issuance.¹³ The proposed rule included an amendment to 50.12 which precluded any exemption from 50.10 authorizing activities *beyond* the scope of an LWA. However this was "deleted as unnecessary in light of the Commission's policy of granting exemptions from §50.10(c) sparingly and only in cases of undue hardship."¹⁴

The Commission explicitly considered the value of the LWA procedures and the relation to exemptions:

"A number of comments suggested that the Commission should adopt a more liberal policy regarding granting of exemptions from §50.10(c) pursuant to §50.12(a). The Commission has rejected this suggestion and will continue the present policy of granting such exemptions sparingly and only in cases of undue hardship. A number of comments also suggested that the provisions in §50.10(e) requiring a full NEPA review and hearing prior to grant of authorization were unnecessary and would unduly delay plant construction. The Commission believes however, that such provisions, which facilitate public participation and ensure appropriate consideration of NEPA matters, are in the public interest and should be retained in the rule."¹⁵

The following comment made by the Commission in 1974 is of interest in the present case:

"Consideration of the instant amendments arises at a time of deep national concern over energy sources and supply — a concern which the Commission fully shares."¹⁶

The LWA procedures were an attempt to accommodate the Commission's NEPA responsibilities with a need to bring nuclear power plants on line:

"Prior to the enactment of the National Environmental Policy Act of 1969 (NEPA) and the amendments to §50.10 adopted by the Commission on March 21, 1972 (37 FR 5745), site excavation for safety-related structures was generally permitted to be undertaken by applicants without any prior Commission review. The essential distinction between the past situation and the present one is that NEPA now applies to certain Commission actions. However, this essential difference is accommodated in the amendments

¹³ 39 Fed. Reg. 4582 (February 5, 1974) (proposed rule).

¹⁴ 39 Fed. Reg. at 14507.

¹⁵ 39 Fed. Reg. at 14507-08.

¹⁶ 39 Fed. Reg. at 14508.

by the requirement that there be a full NEPA review and hearing on NEPA issues covered by the Commission's NEPA regulations prior to authorizing any on-site work otherwise generally prohibited by §50.10(c) . . . The Commission believes that this approach reflects a reasonable approach toward timely decision making within the framework of the present Act."¹⁷

In 1975 Section 50.12 was modified as part of a number of changes issued to reflect the abolition of the Atomic Energy Commission and the creation of the Nuclear Regulatory Commission.¹⁸ The amendments were characterized as technical and conforming amendments rather than substantive amendments. The footnote to §50.12(a) was deleted, and §50.12(b) was revised to cover a request for an exemption from 50.10 rather than an attempt to show cause why the Commission should not suspend activities which were ongoing during the specified transitional period in 1972. Presumably the transitional determinations had been completed and the original 50.12(b) was no longer necessary. Consequently this change appears to accomplish little more than deleting an unnecessary section and transferring a related section from a footnote to a new paragraph.

One final change of interest occurred in 1976 and 1977. While considering early site review regulations, the Commission proposed to "extend the so-called 'limited work authorization' concept to include production facilities such as commercial isotopic enrichment plants and fuel reprocessing plants, and testing reactors."¹⁹ The Commission did extend the LWA procedures to specified utilization facilities rather than just power reactors. However, the final rule did not include production facilities. The Commission simply asserted it decided not to extend the LWA procedure to production facilities "because this would be premature and unnecessary."²⁰

Can Section 50.12 be Used?

Based on the development of the rules, I reach the following conclusions: The approach currently found in §50.12(b) was originally developed to deal with a transition period which occurred in 1972 when the AEC adopted new restrictions on construction activities to implement its NEPA responsibility. Although it was primarily intended for applicants who had already begun affected activities, there was a recognition from the beginning that exemptions might be justified in a few limited other instances.

¹⁷ 39 Fed. Reg. at 14507.

¹⁸ 40 Fed. Reg. 8774 (March 3, 1975).

¹⁹ 41 Fed. Reg. 16835 (April 22, 1976)

²⁰ 42 Fed. Reg. 22882 (May 5, 1977).

This exemption option has been deliberately maintained, although the Commission has consistently insisted it should be used "sparingly" and only in cases of "undue hardship" or "extraordinary" circumstances.²¹ This high threshold for exemptions was maintained in the face of serious energy concerns in 1974.

However the AEC may have intended the provision, it is nevertheless present in the regulations. Although plausible, there is nothing in the background of Section 50.12 to suggest the Commission intended to preclude an exemption for a first-of-a-kind facility. The failure to expand the scope for LWA's is consistent with simply not extending a routine procedure to a category of facilities for which there is little experience and little necessity. It does not follow the Commission intended to preclude use of a nonroutine procedure for a nonroutine facility. Finally, to forbid its use because of a contention in the hearing essentially repeals the provision, since such an interpretation would transform a 50.12 exemption into an LWA-1, which can be issued after a hearing.

Basically the Commission appears to have preserved its options to act on a case-by-case basis in the event that unusual circumstances justified unusual actions. Consequently, I do not reject on its face the applicants' request. However, they have a heavy burden.

Thus, I conclude the section can be applied.

Should Section 50.12 be Used?

Whether it should be applied turns on whether the exemption route should be used for CRBR. The issue is linked to 50.12(b) (4), i.e., it is a public interest question. In essence, if everyone agrees CRBR should be licensed, then what type of licensing procedure should be followed? The exemption opponents argue that for a first-of-kind reactor, the full, standard (canonical) proceeding should be followed. The applicant argues that what is necessary is for the licensing procedures in the regulations to be followed. Then, since 50.12 is in those regulations, the applicant believes granting the exemption is consistent with following NRC licensing procedures.

I find the applicant's arguments slightly specious. The provision *is* in the NRC regulations—and was used extensively until the LWA provision was included in the NRC regulations. The 50.12 exemption route was used for 49 facilities in the last fifteen years. However, after the LWA rule was

²¹ E.g., 39 Fed. Reg. at 14507; *Louisiana Power & Light Company* (Waterford Steam Electric Generating Station, Unit 3), CLI-73-25, 6 AEC 619, 622 n.3 (1973); *Washington Public Power Supply System* (WPPSS Nuclear Project Nos. 3 and 5), CLI-77-11, 5 NRC 719, 723 (1977).

published in April, 1974, LWA-1's were issued for 55 plants. The *only* 50.12 request granted *since* April 1974 was in a case where (a) an LWA-1 had already been granted (and therefore the initial environmental hearing had been held), (b) the applicant wanted approval for construction activities going beyond those approved in the first LWA, (c) the NRC had in place a policy statement prohibiting issuing additional LWA's until a particular rulemaking was completed, and (d) the request (referred to variously as a request for a broader LWA and for an exemption) was unopposed by the parties to the hearing. Thus, while the applicant is correct — a 50.12 exemption is part of the NRC licensing procedures — granting such an exemption would place the CRBR proceeding in the rare category, the category of extremely unusual procedures. To the extent that meeting full NRC licensing procedures is among the objectives of the CRBR program, use of a 50.12 waiver prevents meeting these objectives.

A major issue relating to the public interest is what is meant by licensability. As I recall, one objective of the CRBR project from its beginning has been to demonstrate licensability. The requested exemption is perceived by many as removing CRBR from the NRC's normal process and thereby damaging the possibility that the project can meet the licensability objective. Thus, for example, Senator Quayle wrote:

"The legislative history of the Clinch River project clearly shows that a major goal of this project is to demonstrate the licensability of the liquid metal fast breeder reactor. Any deviation from licensing procedures established by NRC would obviate this purpose and deprive the nuclear industry of the clear precedents needed to proceed with additional LMFBR plants.

I believe the best way to assure a stable future for the nation's nuclear industry, which represents a vital part of our present and future energy supply structure, is to stabilize and clarify the regulatory environment. Exempting demonstration plants from normal regulatory requirements can only delay progress toward meeting this goal. It will also retard the progress of proving new technology. For these reasons, therefore, I request that you deny DOE's request for exemptions."²²

These arguments do not lead me to reject the request, however, since it is not an NRC requirement that we follow our normal licensing procedures. However, DOE must make a strong showing on the 50.12(b) factors.

²² Letter from Senator Quayle to Chairman Palladino (February 5, 1982).

III. Consideration of Section 50.12(b) Factors

Section 50.12(b) instructs the Commission to consider and balance four factors: (1) environmental impact, (2) redressability, (3) foreclosure of alternatives, and (4) public interest.

Environmental Impact

The first factor concerns "significant adverse impact on the environment." Inherently this is not a trivial issue for site preparation activities. The Commission originally redefined construction to include site preparation activities because "site preparation constitutes a key point, from the standpoint of environmental impact, in connection with the licensing of nuclear facilities and materials."²³

In 1977 the NRC staff prepared a final environmental statement (FES) for the CRBR.²⁴ The staff concluded that site preparation activities, conditioned as proposed in the FES, would not result in significant adverse environmental impacts. Although there have been changes since that evaluation, the NRC staff continues to believe no significant adverse impacts will result.

In addition, the local authorities are strongly in favor of the project. We have received letters of support from the Mayor and the Administrator of Clinton, Tennessee, from the Mayor and City Coordinator of Harriman, Tennessee, from Tennessee State Representative McNally, who represents Oak Ridge, from Governor Alexander of Tennessee, and from Mayor A. K. Bissell of Oak Ridge, who spoke at the Commission's public meeting on February 16, 1982. Such support, while a strong positive indication, is probably not sufficient to show negligible environmental impact (I believe the authorities of West Valley, New York also supported that project when it was proposed). But if the Commission weighs heavily the opposition of local authorities to siting a facility, we should similarly weigh such support. The local authorities also agree with DOE's contention that some of the proposed work would also be valuable for future industrial development of the site. Nevertheless, \$88 million would be spent on project construction and, even at today's high prices, that represents a significant construction project — it clearly will have an impact on the area.

Although the impacts are not so trivial that they can be entirely ignored, they do not weigh strongly against the exemption.

²³ 37 Fed. Reg. at 5746.

²⁴ "Final Environmental Statement Related to the Construction and Operation of the Clinch River Breeder Reactor Plant," NUREG-0139 (December 1976).

Redressability

The second criterion, whether redress of adverse impacts “can reasonably be affected” is not completely separate from the first. The applicant argues that all but the detailed topography can be restored for about 10% of the construction cost, and that some of the activities (e.g., the railroad spur and roads) could be left to enhance industrial development.

I do not read the criterion as asking whether the site *would* be restored but, rather, whether it *could* be restored. The former addresses Congressional funding; the latter, the facts of construction and restoration. Although I am skeptical that what takes \$88 million to do can—at a later date—be undone for \$8 million, I agree with the applicant that it should be possible to undo what they propose to do. The applicants will not be able to restore all of the original topographic features. However, I believe some consideration should be given to the industrial zoning which indicates local feeling about appropriate uses.

This factor does not weigh against granting the exemption. Reasonable restoration is possible, although there may be some practical problems because of funding considerations.

Foreclosure of Alternatives

The third factor concerns whether the activities would “foreclose subsequent adoption of alternatives.” The intervenors argue it would foreclose their contention that an LWA cannot be granted for a first-of-a-kind reactor. This is a bootstrap argument. To forbid the use of exemption authority because of a contention in an LWA hearing effectively nullifies the exemption authority. If the exemption must await the LWA-1 hearing, the authority becomes meaningless because an LWA-1 itself can be issued after the hearing. As for the merits of the issue, I see no reason why it needs to be discussed in a hearing. It is basically a legal argument. I do not believe the intervenors’ foreclosure argument is persuasive. No other arguments were raised as to issues that would be foreclosed.

The staff concluded in its 1977 final environmental statement that the ERDA sites at Hanford, Idaho and Savannah River “are better than the proposed site or any of the other alternative sites because the isolation provided would result in lower radiation doses in the event of an accidental release of radioactivity, in terms of both the nearest receptor and the number of people exposed.”²⁵ However:

“A delay of 2-1/4 years in completion of the project appears to be the minimum result of a change in site location at this time,

²⁵*Id.* at 9-22.

assuming current schedules would otherwise be met . . . The staff's overall conclusions hinge on a balancing of the reduction in accident risks achievable with a remote location against the resulting costs and inability of the demonstration plant to accomplish its goals on a time frame compatible with the present timing goals of the LMFBR program . . . In balancing the factors discussed above, the staff's judgment is that the applicant's preferred proposal, utilizing the Clinch River site, is reasonable and that no substantially better alternative is available."²⁶

The \$88 million for project construction represents a significant investment. More important than the money, the work will give this site an additional edge in terms of timely completion. Thus there is potential prejudice to the alternate sites issue.

However, the Clinch River site already has an edge as evidenced by the staff's decision in 1977, and there is no reason to believe the incremental advantage obtained through work under the proposed exemption is sufficient to foreclose consideration of alternative sites. This conclusion is influenced by the redressability considerations discussed above. In addition, anyone following this project at all closely realizes that there is no real possibility of an alternative site for the CRBR.

On balance, I believe factor (3) of Section 50.12(b) is neutral regarding this exemption request.

Finally, the public interest factor must be addressed — as has been obvious from the beginning. Since the Applicants have a heavy burden and the other three factors are marginal, it is clear that consideration of the public interest criterion will be determinative for me.

IV. Public Interest

In considering the effect of delay on the public interest, there are three issues: (1) Is there a Congressional mandate for the exemption? (2) Is there a need to quickly move ahead on the project for either the power or the R&D? (3) Is there a substantial dollar cost to the taxpayer for delay?

If some or all are strongly "yes," then it would seem 50.12(b) (4) would carry the waiver request.

Congressional Mandate

On December 24th the Commission asked the DOE: "Is there any indication in the acts providing for CRBRP authorizations or appropri-

²⁶ *Id.* at 9-23.

ations, associated committee or conference reports, or legislative history that speaks to the licensing procedures to be used by the NRC?"²⁷ In response, the applicant quoted the Omnibus Appropriations Bill:

"The Omnibus Budget Reconciliation Act of 1981, Pub. L. No. 97-35, includes a Congressional mandate for expeditious project completion. The Conference Report accompanying this legislation and the contemporaneous statements of the floor managers at the time of the enactment conclusively demonstrate the following elements of Congressional intent:

- a. The plant must be constructed in a timely and expeditious manner; construction must be undertaken as expeditiously as possible; the cooperation of all agencies is required."²⁸

However, in testimony before us, the lead spokesman for the applicant, Mr. Edgar, was less positive:

"Commissioner Ahearne: My question is, do you read the omnibus budget bill as at least implying Congressional intent that the NRC should grant the exemption?

Mr. Edgar: It implies Congressional intent, or in fact reflects the Congressional intent that Clinch River should be completed as expeditiously as possible. It does not address 50.12 per se. It provides a basis upon which the Commission can take that into account as a matter of policy in whether to exercise its discretion to use 50.12.

Commissioner Ahearne: My question is, do you read it as implying that it's the Congressional intent that we should grant the exemption?

Mr. Edgar: It reinforces it."²⁹

Several Senators and Congressmen have warned us not to interpret the language as endorsing the waiver and others have advised us it is consistent with the waiver request.

Those endorsing the request all point out the exemption would be consistent with the Congressional intent.

The Chairman of the House Committee on Science and Technology, Representative Fuqua, joined by fourteen other members, including the Chairman of the Subcommittee on Energy Research and Production, Representative Bouquard:

"We would, therefore, confirm that the Secretary's request is consistent with Congressional intent."³⁰

²⁷ "Memorandum and Order," CLI-81-35, Attachment A, Question 2 (December 24, 1981).

²⁸ "Applicants' Answers to Questions Set Forth in Attachment A to the Commission's December 24, 1981 Order" at 5-6 (January 18, 1982) (footnotes omitted).

²⁹ Unofficial transcript of Commission meeting on February 16, 1982 at 188

³⁰ Letter from Representative Fuqua *et al.* to Chairman Palladino (February 11, 1982).

The Chairman of the Senate Subcommittee on Nuclear Regulation, Senator Simpson, joined by Senator Domenici, Chairman of the Senate Budget Committee:

"We believe that NRC approval of the Secretary of Energy's request pursuant to Section 50.12, provided the Commission finds that all other requirements of that section are met and that such action is consistent with its statutory responsibilities for protection of the public health and safety, would be fully consistent with the expressions of Congressional intent respecting this project"³¹

The Chairman of the Senate Committee on Energy and Natural Resources, Senator McClure:

"I therefore confirm that the Secretary's request is consistent with Congressional intent."³²

And, finally,³³ the Senate Majority Leader, Senator Baker said:

"If the Commission finds in its deliberations and considerations that the four criteria of 10 CFR 50.12 are satisfied, then I believe it is consistent with the established and continuing purpose of section 50.12, and in the public interest as expressed repeatedly by the Congress, for the Commission to act favorably on the submission by the Secretary of Energy. The intent of the Congress has most recently again been expressed in the Conference Report on the Omnibus Budget Reconciliation Act of 1982, (P.L. 97-35), wherein the Clinch River Breeder Reactor Project is identified as an essential element of the Liquid Metal Fast Breeder Reactor program. The Conferees directed that the Project should be constructed in a timely and expeditious manner. The accompanying floor statements by the managers of the Reconciliation Act in both Houses of the Congress interpret and amplify that report language.

In my judgment, if the Commission finds that the requirements of section 50.12 are met, favorable action on the DOE request would be entirely in harmony with the Commission's statutory role to protect the public health and safety, while continuing to reserve

³¹ Letter from Senators Domenici and Simpson to Chairman Palladino (February 25, 1982).

³² Letter from Senator McClure to Chairman Palladino (February 17, 1982).

³³ It should be noted that the Science Advisor to the President, Dr. Keyworth, has also advised us that:

"From the standpoint that Congress has funded the program and that the President has directed the completion of the CRBR, the requested exemption is consistent with national policy and the public interest." Letter from Dr. Keyworth to Chairman Palladino (February 24, 1982).

for the Congress the policy determination related to the funding, timetable, and role of the Project in the LMFBR program."³⁴

However, the quoted letters do not indicate a belief that Congress *considered* the 50.12 waiver provision and *intended* for us to use it. This point has been made by several other Congressmen:

The Chairman of the Senate Appropriations Committee, Senator Hatfield, joined by Senator Cohen:

" . . . If the NRC were to authorize site preparation activities at this time, it would be compelled to grant exemptions from established regulatory procedures for the CRBR. We have serious doubts about the wisdom of granting such exemptions.

The Clinch River Breeder Reactor was authorized in 1970 by P.L. 91-273 as a demonstration project that would lead to the early commercialization of breeder reactors. Since its inception, NRC licensing of the CRBR has been an integral part of the project.

. . .

Throughout the annual debates over the CRBR, Congress has never expressed support for regulatory exemptions for the project. To the contrary, the Omnibus Budget Reconciliation Act conference agreement reaffirms the need for proceeding with the established regulatory course for the CRBR in order to make future commercialization possible. The Conference report states, 'The conferees intend that the plant should be constructed in a timely and expeditious manner, so that a decision on the commercialization and deployment of breeder reactors can be made on the basis of information obtained in the operation of the plant.'

We do not agree with Secretary Edward's assertions that the CRBR ' . . . must be expeditiously constructed to meet the objectives of the CRBR program.' To the contrary, we believe it is in the best interests of future commercial development of LMFBRs for the CRBR to undergo the established regulatory procedures without exemption. Furthermore, we believe granting exemptions to the CRBR could seriously erode the public's confidence in the federal nuclear energy programs in general and breeder reactor programs in particular."³⁵

The Chairman of the House Committee on Interior and Insular Affairs and Chairman of the Subcommittee on Energy and the Environment, Representative Udall:

³⁴ Letter from Senator Baker to Chairman Palladino (February 26, 1982).

³⁵ Letter from Senators Hatfield and Cohen to Chairman Palladino (December 15, 1981).

“ . . . As chairman of the Committee with primary jurisdiction in the House over the nuclear regulatory process, I am concerned about the implications of the Commission's actions (pursuant to the Secretary's request) on the siting and licensing of the CRBR.

Existing regulations (10 CFR Part 50.10) provide for a procedure whereby site preparation and excavation and certain other onsite activities could be undertaken prior to the issuance of a construction permit for the CRBR. The purpose of this regulatory procedure is to lessen the impact of the licensing process on an applicant's construction schedule and expedite completion of the project. The Secretary has determined, however, that this orderly procedure is inadequate in the case of the CRBR. He has requested, therefore, that the Commission provide the extraordinary regulatory relief of granting an exemption (under 10 CFR Part 50.12) that would allow CRBR site preparation prior to and without fulfilling the requirements for issuance of a limited work authorization (LWA). To my knowledge, the Commission has not granted an exemption under 10 CFR 50.12 in a contested proceeding since the adoption of the LWA regulations in April 1974; a practice in keeping with the Commission policy of granting such exemptions sparingly and only in cases of undue hardship.

Prior to a final decision on the Secretary's request, I hope the Commission will consider fully the adequacy of established LWA procedures to allow a timely commencement of CRBR site preparation while protecting the integrity of the licensing process and the rights of all parties to participate in the proceeding.

. . .

Finally, to the extent that Clinch River is intended as a demonstration of the commercialization potential of breeder reactors (including their ability to be licensed by NRC), it appears somewhat self-defeating to shortcut the normal licensing process at the first opportunity. In the event that the Commission grants the exemption sought by the Secretary, public confidence in the regulatory process as it applies to Clinch River and future breeders may suffer unnecessary and irreparable harm.”³⁶

The ranking minority member of the Senate Subcommittee on Nuclear Regulation, Senator Hart, joined by Senators Tsongas, Humphrey, Bumpers, and Bradley:

“We do not believe that it has ever been the intent of Congress to encourage such exemptions, nor do we believe that such exemp-

³⁶ Letter from Representative Udall to Chairman Palladino (December 8, 1981).

tions are in the best interests of possible future commercial development of Liquid Metal Fast Breeder Reactors (LMFBRs).

The legislative and contractual history of the Clinch River project clearly state that one of the goals of this project is to demonstrate licensability of LMFBRs for commercial application. To exempt this project now would merely postpone this determination and cause extensive delay and increased cost of any LMFBR plant that might follow. The time to clearly demonstrate LMFBR licensability is now.

. . .

This report language [Conference Report accompanying the Omnibus Budget Reconciliation Act of 1981] is not a request for regulatory exemptions. To the contrary, it reaffirms the need to go through all steps of established regulatory procedure now to pave the way for possible future commercialization.

We urge you to consider these points and deny DOE's request for exemptions."³⁷

Examination of the legislative history does not show any indication that a 50.12 waiver request was addressed—even by suggestion—in discussions on the bill. Hence, although it is clear Congress supported moving ahead expeditiously on the CRBR, there is nothing to show this was not intended to direct DOE to get the licensing process restarted—rather than to direct the NRC to waive our normal procedures. Consequently, I do not read the Congressional action as a directive to waive—or not waive—our normal procedures.

Need for Power or for R&D

Turning to the second point, "although the Clinch River facility will produce electricity for the TVA power system, the proposal is not being justified on the basis of the electricity it will generate."³⁸ In addition, the Conference Report for the Appropriations Bill stated:

"The conferees intend that the plant should be constructed in a timely and expeditious manner, so that a decision on the commercialization and deployment of breeder reactors can be made on the basis of information obtained in the operation of the plant. The plant should therefore be constructed on the basis of that objective, and not on the basis of providing needed power in the specific region of the Clinch River site."³⁹

³⁷ Letter from Senator Tsongas *et al.* to Chairman Palladino (December 9, 1981).

³⁸ CLI-76-13, 4 NRC at 77.

³⁹ H.R. Rep. No. 97-208, 97th Cong., 1st Sess. at 827 (1981) (Conference Report for the Omnibus Budget Reconciliation Act of 1981).

Of course, this should also remove need for production of power as a factor supporting the exemption. (Fortunately, since with TVA deferring power rapidly and with an extremely aggressive conservation program⁴⁰ it would have been difficult to rest on the need for 350 MWe for the TVA system.) As for the R&D need, in its 1976 decision the NRC decided to defer to DOE on questions of the general need, including timing. DOE has made little effort to support this exemption on the basis of the adverse impacts of delaying R&D results. (Although I defer to DOE's judgment, I note DOE has merely provided a few conclusory statements with little supporting material.) Thus the need for R&D does not provide a justification for the exemption request.

V. Dollar Costs of Delay

Which rests the decision upon the cost. And it is here that the applicant has presented his worst case. The cost of delay has been the subject of substantial discussion, both in filings by the applicants and the NRDC and in the public meetings held by the NRC. The applicant has presented several substantially different cost estimates - for the most part unrelated - and has used creative accounting.

It has been difficult to get a firm estimate from the DOE. The DOE has shifted position substantially. On November 30th, when DOE initially submitted their application, Secretary Edwards wrote:

*"Absent approval of this request, procedural delays will cause undue hardship in the form of another 1-2 years of delay and \$120-240 million of increased costs. . . . Approval of this request would avoid hardship to the project and Federal taxpayer, since it would avoid another 1-2 years of delay and \$120-240 million of increased costs."*⁴¹

Secretary Edwards went on to reiterate this last point:

*"Approval of the request would . . . save the taxpayers \$120-240 million."*⁴²

And later,

*"Additional . . . cost increases of \$120-240 million can be avoided if the Commission recognizes the unique and extraordinary circumstances surrounding the project."*⁴³

Secretary Edwards enclosed a November 1981 Site Preparation Activities Report,⁴⁴ which he said "provides the detailed justification and support

⁴⁰ Office of Power, Division of Energy Conservation and Rates, Tennessee Valley Authority, "Program Summary" (October, 1981) (TVA/OP/ECR-82/1).

⁴¹ Letter from DOE Secretary Edwards to Chairman Palladino at 2 (November 30, 1981).

⁴² *Id.* at 3.

⁴³ *Id.* at 3-4.

⁴⁴ "Clinch River Breeder Reactor Plant: Site Preparation Activities Report" (November 1981).

for this 50.12 request." The only addressal of the delay cost came in Section 7.0., "Effect of Delay on the Public Interest," where the total discussion of the cost consists of the following:

"If approval to initiate site preparation activities identified herein is granted by March 1, 1982, it is estimated that the current Project schedule can be shortened by at least 12 months. Taking into account only the costs of those activities that are sensitive to schedule changes, the estimated 12 months reduction in schedule is conservatively estimated to result in a direct savings of \$120 million."⁴⁵

Certainly this magnitude of cost would be a significant factor and would weigh heavily on the side of granting an exemption in the public interest. Therefore, the Commission requested DOE in our order of December 24th to:

"(a) Provide the documentation which forms the basis for projected cost of delay and environmental impact estimates referred to in the Site Preparation Activities Report and Secretary Edwards' letter.

(b) Demonstrate the validity of the cost estimate."⁴⁶

The DOE responded on January 18th:

"Applicants estimate that, absent authorization pursuant to Section 50.12 to begin site preparation activities the Project will incur (1) additional delays at one-to-two years duration and (2) corresponding increased costs in the amount of \$120-240 million"⁴⁷

The DOE went on to state:

"The range of delay costs can be conservatively estimated on the basis of: (1) an estimate of cost increases for certain unavoidable management activities which are particularly sensitive to delay; (2) an estimate of the effects of inflation assuming a delay in initial criticality from September 1988 to February 1990; and (3) an estimate of the cost of capital expended on hardware for the period of delay. Each of these estimates are more fully described below; they show that the cost estimate of \$120-240 million in the SPAR is clearly conservative."⁴⁸

. . .

⁴⁵ *Id.* at 7-2.

⁴⁶ CLI-81-35, Attachment A, Question 9.

⁴⁷ Applicants' January 18, 1982 Answers at 40.

⁴⁸ *Id.* at 41 (footnote omitted).

"The Applicants' estimate that the cost of maintaining the various management groups for an additional one-to-two year period is \$42.3 million per year."⁴⁹

Turning to inflation, the DOE noted:

". . . the CRBRP Project is funded through Congressional appropriations and thus operates with, and all costs are estimated based upon, year of expenditure dollars. Total project costs are estimated using a standard 8% escalation value. Any increased costs due to delay in this case will be borne by the nation's taxpayers, and the Commission should not ignore the adverse effects of inflation upon the taxpayer.

The Applicants estimate that the impact of a one-to-two year delay amounts to \$88.8 million per year"⁵⁰

Finally, the DOE argued:

"Whenever an organization, including the United States Government dedicates funds to a capital project, it foregoes the opportunity to invest those funds in alternative projects which will earn an equal or greater return on investment *or* to pay off debt on which the capital costs are being incurred. In short, the organization 'ties-up' capital and incurs an opportunity cost. Although certain components of the cost may be difficult to measure, it is, in an economic sense, a real cost and is included as a cost in an investor owned utility's accounting and ratemaking.

. . .

A one-to-two year delay in the Project schedule will result in additional cost on expended capital during the delay period. In order to arrive at a conservative estimate of the cost of capital during the delay period, a rate of 10 percent* was applied only to the capital costs for hardware.** The delay costs amount to \$43.9 million on a yearly basis

* The interest rate applied is substantially less than that established by the Secretary of Treasury pursuant to Public Law 92-41. See CAS 417.50. As of January 1, 1982, the rate established by the Secretary of Treasury was 14 3/4 percent. 47 Fed. Reg. 366 (Jan. 5, 1982).

** Applied to *total* capital costs the yearly cost of capital attributable to delay amounts to approximately \$110 million per year."⁵¹

⁴⁹ *Id.* at 42.

⁵⁰ *Id.* at 44.

⁵¹ *Id.* at 45-46.

Therefore the DOE concluded a one-to-two year delay would result in cost increases per year of \$42.3 million for unavoidable management activities, \$88.8 million for inflationary impact, and \$43.9 million for "increased interest on expended capital for hardware alone."⁵² Thus, although the DOE never totalled the numbers, the reader could reasonably infer a one year delay would cost \$175 million.

However, government agencies, departments, etc., are financed by fund accounts.⁵³ That is, they are given money for specific purposes — those identified in their annual budgets. If the money is not used for this purpose, it must be "returned" to the Treasury. Some monies must be spent in the given fiscal year, although much R&D funding is "no-year" money and is available until expended. Nevertheless, fund money cannot be saved and invested for profit. Expenditures from fund money then have no real opportunity cost while monies spent from the asset or expense accounts of the private sector do.

The money raised in taxes by the Treasury is distributed to the various agency funds via the budgeting process. However, the government does not tax to accumulate capital. Thus Treasury monies have no real opportunity because they are also funds. It follows then that no cost accrues to the use of government funds, e.g., to government monies spent on government activities or projects directly operated by the government other than the one-for-one depletion of the fund. This is true if and only if fund money is used.⁵⁴

On January 18th, NRDC and the Sierra Club filed comments on the November DOE application. They pointed out that "delay costs appear to be based almost solely on anticipated inflation When the time value of money is taken into account, inflation-related costs of delay vanish, because of offsetting savings from postponing expenditures."⁵⁵ They argued

⁵² *Id.* at 46.

⁵³ Funds differ from cash accounts in that assets are placed in funds for *specific* purposes. The use to which these monies may be put is restricted to the purpose of the fund. Idle fund money cannot be used to pay the rent, invested for revenue, etc. (unless it is an investment fund). Only the monies needed to finance the responsibilities of the fund are assigned to it. The fund does not have title to the money, only the use of it.

⁵⁴ Normally, when the government wants to build a costly project, it hires a private contractor to do the work. The contractor pays the cost of the effort and is reimbursed, often at intervals during the process of construction. The contractor must borrow to pay operating expenses. The private contractor, because he must borrow at a real cost (interest) or use his own funds which do have real opportunity costs, may claim the cost of interest as a cost to the project. Therefore, if CRBR were being built by a non-government entity, interest costs would be a cost to the project. Since CRBR is being built largely by DOE with government funds, no opportunity cost should be imputed to the government money.

⁵⁵ "Comments of the Natural Resources Defense Council, Inc. and the Sierra Club in Opposition to Applicant's Exemption Request Under 10 CFR §5012" at 32 (January 18, 1982).

that "Because the interest rate at which the Treasury borrows is currently greater than the inflation rate, there would be an actual savings by deferring expenditures on the project."⁵⁶ The intervenors cost expert, Charles Komanoff, estimated "that a 1-year deferral in construction actually creates a savings, in present value terms, on the order of \$30 million."^{57,58}

Mr. Komanoff also calculated the effect of loss of revenue from the CRBR to be \$20 million for a one year delay. (He obtained that by neglecting CRBR fuel processing and fabrication costs and assuming CRBR maintenance costs would be the same as the 1980 U. S. nuclear plant average and the CRBR capacity factor would be the same as the U.S. nuclear average to date.)

On January 28th, the DOE provided comments on the NRDC comments.

DOE agreed that time value of money should be taken into account, but said:

"Unfortunately, NRDC fails to understand that in calculating the cost or saving from delay, not only unexpended funds but also expended funds must be taken into account. In fact, the Project incurs a substantial cost on expended funds as a result of any delay in beginning site preparation activities"⁵⁹

DOE stated that they "continue to rely on their earlier cost submission made in Response to Question 9 of the Commission's Order of December 24, 1981."⁶⁰

They did present a table giving a present worth analysis of anticipated project expenditures and concluded "The net effect after discounting anticipated expenditures to present worth, is a \$30.2 million savings."⁶¹ They went on to consider "the elements of the 'time value of money' neglected by NRDC."⁶² Chart B (following p. 31) shows "Cost of Annual Interest of Expended Capital at 11%" to be \$189.9 million. This is arrived at by taking each year expenditures, from 1979 to 1981, inflating at 11% per

⁵⁶ *Id.*

⁵⁷ "Statement of Charles Komanoff Presented to the Nuclear Regulatory Commission in Opposition to Applicants' Exemption Request Under 10 CFR §50.12" at 6 (attached to January 18, 1982 NRDC/Sierra Club opposition to DOE request).

⁵⁸ I believe that the arguments introduced by Komanoff and taken up in later presentations by DOE on the time value of money are invalid in the context of a government run, fund-supported project such as the CRBR. I summarize the submissions here to document the changing DOE position.

⁵⁹ "Applicants' Response to Natural Resources Defense Council, Inc. and Tennessee Attorney General's Comments" at 28 (January 28, 1982).

⁶⁰ *Id.* at 29 n. 32.

⁶¹ *Id.* at 30.

⁶² *Id.* at 31.

year to the present, and then taking 11% of the total. The DOE also calculated the present worth of lost revenue from a one year delay in operating the CRBR to be \$5.9 million.⁶³

The DOE concluded:

"A complete analysis which accounts for the 'time value of money' results in the following project costs and savings due to delay:

Net Savings on Anticipated Expenditures	\$30.2
Interest on Past Expenditures	\$189.9
Loss Due to Deferral of Revenue	\$5.9

In summary, in the event of a one year delay, the project will incur substantial increased costs. The elements of the delay costs on a yearly basis include: (1) increased management costs in the amount of \$42.3 million;³⁰ (2) inflation in the amount of at least \$88.8 million;³¹ (3) using NRDC's analysis methods, interest on expended capital on a net basis of \$23.5 million;³² and (4) losses due to the deferral of revenue in the amount of \$5.9 million. As these analyses demonstrate, the range of costs estimated in the SPAR OF \$120-240 million is clearly conservative.

³⁰ See Applicants' Answers at 77.

³¹ See Applicants' Answer at 46, 78.

³² The net interest on capital of \$23.5 million was derived by deducting the gross cost savings attributable to a one year delay from the interest costs on expended capital. Applicants' previous submittal estimated this value at \$43.9 million. Applicants Answers Question 1 Answers 9 (a)-(b), Appendix C. The additional refinements suggested by NRDC's methods of analysis provided a basis for the more rigorous analysis herein."⁶⁴

The reader was thus left to conclude the true cost is \$161 million (using the summary), \$166 million (using "time value of money"), or \$175 million (from the January 18th response).

NRDC-Sierra Club responded on January 28th, again using Komanoff:

"[T]he future rate and level of expenditures on CRBRP have no bearing on the cost of past expenditures.' Applicants' capital investments in the project are essentially sunk costs. They will have to pay interest on these investments at the same rate regardless of the project's start-up date. Put another way, 'There is no linkage whatsoever between progress of CRBRP and the Government's obligation to pay fixed costs of financing past expenditures.'"⁶⁵

⁶³ *Id.* at Chart C (following Chart B).

⁶⁴ *Id.* at 32-33.

⁶⁵ "Supplemental Comments of the Natural Resources Defense Council, Inc. and the Sierra Club in Opposition to Applicants' Exemption Request Under 10 CFR §50.12" at 6 (January 28, 1982) (quoting "Supplemental Statement of Charles Komanoff Presented to the Nuclear Regulatory Commission on January 28, 1982 in Opposition to Applicants' Exemption Request Under 10 CFR §50.12" which is attached to the supplemental comments).

The DOE position was aggressively questioned by the Commission in the February 12th public meeting. The Commission requested that the costs be examined by the group that had been calculating cost of utility delay (for use in monthly NRC submissions to the House Appropriations Subcommittee on Energy and Water Development).

The DOE responded, in a February 25th letter from Deputy Secretary Davis,⁶⁶ stating:

- (1) The DOE no longer provides cost analyses to Mr. Bevill.
- (2) In view of recent department reorganizations, the Office of Policy, Planning and Analysis has the relevant responsibility and expertise and therefore has developed the response.
- (3) There are "three distinct perspectives on the cost of delay"⁶⁷
 - (A) The Appropriations or Fiscal Perspective. Mr. Davis stated:

"Each year, as Congress debates the funding to be appropriated to the project, the legislator's viewpoint for the decision will be in terms of inflated dollars. The cost of the project to date is always expressed in inflated dollars, not constant dollars. . . .

From the appropriations perspective, a one year delay will cause the project costs to increase because of inflation on labor and materials, as well as the added costs of management during the delay. Offsetting these costs will be revenues that are higher due to inflation during the delay. These have been estimated to be: \$136 million in cost inflation; \$42 million in management costs; and higher revenues (a net credit) of \$49 million. This results in a net total of \$129 million in increased appropriations over the life of the project."⁶⁸

(B) The economic or resource perspective. Mr. Davis identified these by distinguishing them from the third perspective;

"Economic costs measure the total burden upon the productive capacity of the national economy. Financial costs measure the relative burden upon individual parties and provide a useful perspective when considering individuals, firms or governments as operating entities. Thus, while in a given case, past expenditures may have no economic cost, the individual, firm or government making those expenditures may sustain a real financial cost because capital is tied up unproductively."⁶⁹

⁶⁶ Letter from DOE Deputy Secretary Davis to NRC Commissioners (February 25, 1982).

⁶⁷ *Id.* at 2.

⁶⁸ *Id.* at 3 (footnotes omitted).

⁶⁹ *Id.*

He calculated this economic cost to consist of \$38 million for maintaining the necessary management, \$20 million for deferred revenues (DOE now accepts the Komanoff estimate, and a savings of \$30 million from deferral of anticipated expenditures. Thus he concluded "Total Quantifiable Economic Costs" would be \$28 million.⁷⁰

(C) The Financial Cost Perspective. Mr. Davis stated:

"By analogy to commercial power or industrial plants, the effect of a one year delay in project completion will result in the capitalization of an additional year of interest measured at the time of plant completion."⁷¹

He then calculated a present worth total financial cost of \$218 million. Thus we have the following DOE estimates for a one-year delay:

- | | |
|--------------------|---|
| November 30, 1981: | \$120 million |
| January 18, 1982: | (a) \$120 million, "clearly conservative" |
| | (b) \$175 million |
| January 28, 1982: | (a) \$120 million, "clearly conservative" |
| | (b) \$161 million |
| | (c) \$166 million |
| | (d) \$175 million |
| February 25, 1982: | (a) \$129 million, "appropriations perspective" |
| | (b) \$ 28 million, "economic perspective" |
| | (c) \$218 million, "financial perspective" |

I conclude the DOE has finally agreed that as far as the true dollar cost of delay, it is in the region of \$30 million—coincidentally, about the cost of the management team. Thus, I need not go into detail as to why I disagree with the earlier DOE estimates. The DOE has dropped them, insofar as we are to address "economics."

This is sufficiently different from the original estimate as to indicate the DOE paid little attention in preparing its original statement, although the series of estimates does not lead me to have confidence in *any* of the estimates. In the case of a utility applicant we would look with strong disfavor on such rapidly shifting submissions.

Thus, I conclude the DOE has failed to make the public interest case and, in the cost area, badly.

I am also concerned that DOE may not understand the appropriate controls that should be applied when assuming the role of a license applicant. The NRC has high standards for license applicants — which underlie the concept of licensability, which is a CRBR objective. It is because of these standards that showing licensability is an important accomplishment.

Therefore I vote to deny the exemption request.

⁷⁰ *Id.* at 4.

⁷¹ *Id.* at 5.

DISSENTING VIEWS OF CHAIRMAN PALLADINO

I firmly believe that the DOE request for an exemption under §50.12 should be granted so that preparation activities can proceed at the CRBR site.

I arrive at this conclusion because I believe that the criteria under §50.12 are satisfied in this case. The information and analysis which we have received on the public record from the participants and the Commission offices demonstrate that:

1. the site preparation activities will not have a significant adverse impact on the environment of the CRBR site;
2. the impacts of site preparation can be redressed and the site returned to a condition suitable for future uses;
3. the site preparation activities do not foreclose future alternatives, including the use of the site for other purposes; and
4. delay in conducting site preparation activities, in view of the readiness of the applicant and the national policy to go forward with the CRBR project, can only result in harm to the public interest.

I do not understand the position of my fellow Commissioners who oppose the DOE request on the basis that granting the exemption would not be in the public interest. It appears to me that in opposing the exemption request they are saying the public interest is better served by denying the petition than by granting it. How is the public interest served in not going forward with the CRBR project where the Congress has approved its construction and operation on an expedited basis, where the applicant is ready, willing and able, and where the activities proposed pose no lasting threat to the environment or to the public health and safety?

If one agrees that there are no environmental or health and safety reasons to deny the exemption, one must ask the question, "What can be the basis for denying it?"

One reason that has been suggested is that the "licensability" of CRBR would not be proved if this exemption were granted. However, an exemption for site clearing and preparation will *not* remove the requirement of a construction permit before CRBR is built. The granting of this exemption would not foreclose the consideration of any proper question about CRBR in that CP proceeding. I do not understand how "licensability" is at stake in our decision on the exemption unless one aspect of CRBR licensability is to test its ability to withstand unnecessary delay in regulatory approval of site clearing and preparation.

In addressing licensability, Commissioner Ahearne quotes Senator Quayle that an exemption for DOE would be a deviation from NRC licensing procedures and would not serve the Congressional purpose for CRBR to demonstrate licensability. However, a number of other members of the Senate disagree. For example, Senator McClure has stated that "the Secretary's request [for exemption] is consistent with Congressional intent." Letter to Nunzio J. Palladino, Chairman, NRC, from James A. McClure, Chairman, Committee on Energy and Natural Resources, dated February 17, 1982. The issue is not licensability, but rather whether or not the criteria of 50.12 are satisfied. I believe that they are.

Commissioner Ahearne concludes that Congressional action is not "a directive to waive — or not waive — our normal procedures." However, this statement should not end the matter of Congressional intent for our deliberations. I believe our decision on the exemption can and should be consistent with Congressional policy. The Congressional policy for "expeditious construction of CRBR clearly favors the exemption. The Commission majority does not take issue with my conclusion that denial of the exemption will delay CRBR construction. They simply choose to ignore the delay.

Much attention has been given to the economic costs of delay. I do believe that CRBR will be more costly if we deny the requested exemption. Unfortunately, §50.12(b)(4) of our regulations, which was probably drafted with a commercial generating station in mind, has unduly narrowed the Commission discussions about the public interest criterion.

In this respect, I cannot agree with several of Commissioner Ahearne's statements. For example, he "rests the [CRBR] decision on cost . . ." Why is no weight to be given to the Congressional policy for expeditious construction of CRBR? Also, he states that "R&D need . . . is not an NRC issue." However, our regulations make it an issue, and our prior decisions require us to accept DOE's statement as establishing the need for a demonstration facility, including its timing. *United States Energy Research and Development Administration et al.*, CLI-76-13, 4 NRC 67, 79, 83-84, 92 (1976).

Commissioner Gilinsky believes that to grant the exemption would adversely impact NRC's licensing and safety responsibilities for power reactors. The information which the staff has given us does not support this view. Rather, we have been told that granting the DOE exemption may require less than one staff year of additional effort. I do not believe that the success of our licensing and safety efforts for power plants depends on one staff year.

In summary, I believe that granting the exemption is in the public interest. The criteria for the exemption are satisfied, and completion and operation of the CRBR has already been determined by Congress to be in the public interest. The Congressional intent for expeditious completion of the project is furthered; the R&D purpose and benefits of the project for our nation will occur sooner; and the hardships and uncertainties created by unnecessary delay of the project are minimized.

Therefore, I dissent and would approve the exemption.

SEPARATE DISSENTING VIEW OF COMMISSIONER ROBERTS

At the outset, I would like to put DOE's request for an exemption in a broader context by looking at the requirements of the National Environmental Policy Act (NEPA) in addition to the requirements of the NRC's regulations which were promulgated to implement NEPA. NEPA requires Federal agencies to determine whether their proposals for action are major and whether they will significantly affect the quality of the human environment. If an agency concludes that its action meets this standard, then NEPA requires that an environmental impact statement be prepared and circulated for comment. NEPA does not require that the conclusions of the environmental impact statement be tested in an adjudicatory hearing.¹

This contrasts with Section 50.10 of the Commission's regulations from which DOE has requested an exemption. Under Section 50.10, site preparation activities may not commence until (1) a final environmental impact statement has been issued, (2) a hearing has been held and all environmental findings required by NRC's regulations have been made, and (3) a licensing board has found the site suitable from a radiological health and safety standpoint. Thus, in context, it becomes clear that the NRC's regulations impose more procedural hurdles than the statute (NEPA) they were designed to implement. Specifically, under Section 50.10, an applicant may not commence site preparation until the NRC's final environmental impact statement has been the subject of an adjudicatory hearing. Thus, DOE has requested an exemption not from the requirements of NEPA but from the NRC's requirement that a hearing be conducted prior to site preparation.

¹ At a public meeting on the exemption request, NRDC's representative agreed with this conclusion by stating, "I must say, I do not think the National Environmental Policy Act requires an adjudicatory hearing." Transcript, December 16, 1981, at 41.

Section 50.12(b) establishes the criteria which must be met in order to permit grant of an exemption from Section 50.10. While I will not reiterate these criteria here, I conclude that DOE has made the showings necessary to satisfy each of the four criteria. With regard to the first three criteria, my conclusions rest on the analyses of environmental impacts described in the Clinch River Final Environmental Statement issued in 1977 and in the OPE Report which analyzed the filings submitted by DOE, NRDC, and others.

With regard to the fourth criteria—public interest—I conclude that it *is* in the public interest to receive, as soon as possible, the information which will flow from operation of the Clinch River Breeder Reactor. Congress (as the elected representative of the people) has already determined that the liquid metal fast breeder reactor program generally and the Clinch River Reactor specifically are in the public interest. Given Congress's decision that it is in the public interest that the Clinch River Reactor be built and operated, the Commission's determination of public interest becomes much narrower. The Commission merely must determine whether *early* operation of the reactor, and thus early receipt of research and development knowledge, enhances the public interest.² In light of the fact that no unredressable environmental harm or safety harm has been alleged by any participant, I conclude that, of course, early receipt of research and development information enhances the public interest. Because nuclear reactor technology is very complicated, operating experience is gained slowly. Early operation of the breeder reactor will speed up and increase the informational benefits to be gained.

Given the narrow scope of the Commission's determination, the debate on whether grant of an exemption is in the public interest became rather confused. There was a lot of discussion of the issue of "licensability." That term is, of course, undefined. To me, "licensability" merely means that the Commission is able to license the reactor—in other words, make all the findings required by the Atomic Energy Act (AEA) and NEPA. Grant of an exemption does not affect "licensability." Simply put, there are two routes to pursuing licensing approval—one route involves an environmental hearing prior to site preparation; the other involves a hearing after site

² I do not read the Commission's decision of August 27, 1976, to foreclose Commission recognition of research and development benefits in its determination of what is in the public interest. Rather, that decision deals solely with the need for the staff to determine the "need for power" from the Clinch River Breeder Reactor in the environmental impact statement. United States Energy Research and Development Administration, Project Management Corporation, Tennessee Valley Authority (Clinch River Breeder Reactor Plant), CLI-76-13, 4 NRC 67, 77 (1976).

preparation has begun. Authority to commence site preparation prior to a hearing before a licensing board is based on the Commission (rather than the Staff and a licensing board) making environmental impact and public interest findings. Thus, regardless of which route is followed, every finding required by the AEA and NEPA will be made. If these findings are affirmative, then the Clinch River Breeder Reactor will be "licensable."

Another issue which dominated the public interest discussion was the question of the impact of grant of the exemption on NRC Staff resources. Preliminarily, it is important to note that when Congress decided that the licensing review of the Clinch River Breeder Reactor would be conducted by the NRC, Congress, in effect, allocated staff resources. The Commission was then under a duty to implement Congress's decision which it did by determining that 15 people would be given the full time responsibility for reviewing DOE's application. To date, only 12 of these slots have been filled; of these 12, only 8 are from the NRC Staff. This allocation of Staff resources would not appear to affect adversely the NRC's ability to work on safety issues. Many commentators appear to regret Congress's decision that any Staff members be assigned to the Clinch River review. Be that as it may, Congress acted.

With regard to the question of whether additional staff reviewers would be required if an exemption were granted, the Staff's best estimate is that no additional people would be needed. The Staff did acknowledge, however, the possibility of an additional 1-2 man years. This impact on Staff resources is certainly not sufficient to justify the conclusion that grant of an exemption is *not* in the public interest. Additionally, this level of staffing does not support the claim that the Staff's review has been fast-tracked. The present optimistic estimate of when the NRC's licensing process will be complete and a construction permit issued is 1990. An eight-year licensing review would hardly appear to be fast-tracked. In any event, the Commission has not directed the Staff to speed up its review process in any way.

A third issue raised in the public interest discussion was the cost of delay. DOE showed a cost of delay of \$28 million. NRDC admitted that that amount could be \$20 million. In my mind, a savings to the taxpayers of \$20 million is significant and sufficient to justify the conclusion that grant of an exemption is in the public interest. Moreover, I believe that the cost analyses done by both DOE and NRDC were incomplete. The effects of delay on the liquid metal fast breeder reactor program was not discussed. There was no discussion of escalation cost. There was no attempt to determine what effect delay would have in terms of increased regulatory requirements and in terms of the cost of compliance with increased

requirements. In other words, I conclude that while DOE made the showing necessary to demonstrate a significant cost of delay, I believe that if the analyses had been more sophisticated, the cost of delay probably would have been larger.

In sum, I conclude that DOE made the showings required by Section 50.12(b) and I would grant the exemption requested.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Nunzio J. Palladino, Chairman
Victor Gilinsky
Peter A. Bradford
John F. Ahearne
Thomas M. Roberts

In the Matter of

Docket No. P-564-A
(Antitrust)

**PACIFIC GAS AND ELECTRIC
COMPANY**
**(Stanislaus Nuclear Project,
Unit 1)**

March 17, 1982

The Commission deems a "Notice of Prematurity and Advice of Withdrawal" filed by the applicant in this antitrust proceeding to be a request for permission to withdraw, and refers the matter to the Licensing Board for consideration and decision under the Commission's rule governing withdrawal of license applications (10 CFR 2.107(a)).

**RULES OF PRACTICE: CONSTRUCTION PERMIT APPLICATION
(ANTITRUST MATTERS)**

An application for a construction permit may be submitted in three parts, one of which shall include any antitrust information required by 10 CFR 50.33a. 10 CFR 2.101(a)(5).

**RULES OF PRACTICE: CONSTRUCTION PERMIT APPLICATION
(ANTITRUST MATTERS)**

The purpose of the Commission's rule providing for early filing of antitrust information is to enable utilities to obtain formal, binding resolution of antitrust issues prior to the need to begin construction. Such information must be considered part of an application; if there is no application, there can be no formal proceeding and no binding

adjudication. See Section 105(c), Atomic Energy Act of 1954, as amended, 42 USC 2135(c).

ORDER

On September 18, 1981 Pacific Gas and Electric Company (PG&E) filed with the Commission a Notice of Prematurity and Advice of Withdrawal, seeking through this pleading to advise the Commission that it will no longer participate in this proceeding. PG&E maintains that it has filed no part of an application for a construction permit, that the antitrust information it has submitted is only "pre-application" information and that therefore there are no formal requirements governing its withdrawal.

PG&E is incorrect in its assertion that it can unilaterally withdraw from this proceeding. The antitrust information required by 10 CFR 50.33a is a part of the application for a construction permit. As stated in 10 CFR 2.101(a)(5), the application for a construction permit may be submitted in three parts, one of which "shall include any information required by §50.33a." Moreover, to regard the information submitted here as something other than the formal filing of an application would defeat the whole purpose of the rule providing for early filing. The purpose of the rule was to enable utilities to obtain formal, binding resolution of antitrust issues prior to the need to begin construction. If there is no application there can be no formal proceeding and no binding adjudication. See Section 105(c) of the Atomic Energy Act of 1954, as amended; 42 U.S.C. 2135(c).

Withdrawal of this application is controlled by 10 CFR 2.107(a), which provides as follows:

The Commission may permit an applicant to withdraw an application prior to the issuance of a notice of hearing on such terms and conditions as it may prescribe, or may, on receiving a request for withdrawal of an application, deny the application or dismiss it with prejudice. Withdrawal of an application after the issuance of a notice of hearing shall be on such terms as the presiding officer may prescribe.

The Commission will therefore treat this motion as a request for permission to withdraw. Since the notice of hearing has been issued in this case, the matter lies within the jurisdiction of the Licensing Board under the rule.

In this regard, the Commission notes that PG&E has already requested the Licensing Board to suspend discovery but that this request was denied. Since that time, however, the Ninth Circuit Court of Appeals has upheld the California statutory provisions that stood as an obstacle to the project. The Appeal Board has also issued two opinions — *Puerto Rico Electric*

Power Authority (North Coast Nuclear Plant, Unit 1), ALAB-662, 14 NRC 1125 (1981) and *Philadelphia Electric Company* (Fulton Generating Station, Units 1 and 2), ALAB-657, 14 NRC 967 (1981) — dealing with treatment of requests to withdraw. In addition, it is unclear from the Licensing Board's decisions whether it considered the possibility of imposing terms and conditions on PG&E's withdrawal, such as requiring PG&E to compile and preserve the current status of discovery.

The Licensing Board, which is closely involved in this proceeding, is in the best position to initially evaluate the effect of these considerations on the request to withdraw.

In light of these considerations, the Commission hereby refers this matter to the Licensing Board for consideration and decision.

It is so ORDERED.

For the Commission*

SAMUEL J. CHILK
Secretary of the Commission

Dated at Washington, DC,
this 17th day of March, 1982.

* Commissioner Ahearne was not present; had he been present, he would have approved the order.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Nunzio J. Palladino, Chairman
Victor Gillinsky
John F. Ahearne
Thomas M. Roberts

In the Matter of

Docket No. 50-289

**METROPOLITAN EDISON
COMPANY**
(Three Mile Island Nuclear
Station, Unit No. 1)

March 30, 1982

The Commission, pursuant to a mandate from the Court of Appeals for the District of Columbia Circuit, issues a statement of the reasons for its determination that psychological health is not cognizable under the Atomic Energy Act.

ATOMIC ENERGY ACT: RESPONSIBILITY OF NRC

The Commission's authority under the Atomic Energy Act to protect the public health and safety is limited to the "special hazards of radioactivity." *New Hampshire v. AEC*, 406 F.2d 170, 173-175 (1st Cir. 1969), *cert. denied*, 395 U.S. 962 (1969). It does not extend to protection against psychological stress, which is not a physical risk associated with radioactivity.

ATOMIC ENERGY ACT: RESPONSIBILITY OF NRC

Even if it could be determined that the Commission has the authority under the Atomic Energy Act to consider psychological health, the legislative history makes it clear that the Commission is not required to consider such issues, and strong policy considerations argue against the Commission's doing so.

MEMORANDUM AND ORDER

The United States Court of Appeals for the District of Columbia Circuit, in a Judgment issued January 7, 1982, in *People Against Nuclear Energy v. Nuclear Regulatory Commission*, No. 81-1131, directed the Commission, *inter alia*, to "prepare a statement of the reasons for its determination that psychological health is not cognizable under the Atomic Energy Act."¹

The views of the Commission with respect to the cognizability of psychological health under the Atomic Energy Act may be summarized as follows. First, the Atomic Energy Act itself does not discuss psychological health, and the statute, its legislative history, and applicable caselaw all suggest strongly that Congress intended the Commission to exercise its regulatory authority to protect only against the physical risks associated with radioactivity.

Even if it were found that Congress did not bar the Commission from considering non-physical risks associated with NRC-licensed activities, the indicia of Congressional intent alluded to above make clear that Congress never *required* the Commission to consider psychological health effects under the Atomic Energy Act, and there are strong policy considerations which argue against the consideration of psychological health effects *per se* in NRC licensing and enforcement proceedings. The Commission's reasoning is set forth in greater detail below.

- I. The Focus of the Atomic Energy Act is on the Hazards Which Civilian Nuclear Activities Pose to Physical *Health and Safety*, Not to *Psychological Well-being*.
 - A. The statute, its legislative history, and applicable caselaw all indicate that Congress intended the Commission to protect public health and safety against the physical risks associated with radioactivity.

The Atomic Energy Act does not address directly the question of whether the Commission's regulatory responsibilities extend to psychological effects associated with the operation of nuclear reactors. The relevant

¹ That Judgment came on petitioner PANE's appeal from the Commission's Memorandum and Order of December 5, 1980, in which a 2-2 division of the Commissioners on the question of whether psychological stress contentions should be accepted in the TMI-1 restart proceeding had the effect of denying those contentions. Subsequently, after the appointment and confirmation of a fifth Commissioner, a 3-2 majority stated its adherence to the position that psychological stress contentions should not be accepted in the restart proceeding. That ruling, contained in an order dated September 17, 1981, was not accompanied by an opinion.

statutory provision states only that the Commission has the duty of regulating the operation of nuclear reactors "in order to . . . protect the health and safety of the public." 42 U.S.C. 2021(d). The issue which faced the Commission was one of statutory construction: what did Congress intend the words "health and safety" to mean when it enacted the Atomic Energy Act of 1954?

As explained by Commissioner Hendrie:

The Congress which passed the Atomic Energy Act of 1946 created the Atomic Energy Commission in order to bring a maximum of technical expertise to bear on complex and hazardous activities associated with a developing technology. When the Atomic Energy Act of 1954 authorized the development of a civilian nuclear power industry, it was understood from the first that the public might well be apprehensive about a technology associated in the minds of most with the destructive power of atomic weapons. One of the major reasons for providing for public hearings on nuclear power plants was to provide a means for educating the public about nuclear energy and the measures taken to assure its safety. The 1965 report to the AEC by its Regulatory Review Panel, for example, characterized the most significant functions of public hearings as including a demonstration that "the AEC has been diligent in protecting the public interest" and that the applicant's proposal had received a "thorough and competent review." Congress implicitly acknowledged that public fears about nuclear reactors were a reality which had to be addressed; the means chosen by Congress was to have technical issues of nuclear safety addressed and resolved by technical experts in a public licensing review process administered by the Atomic Energy Commission. Thus, it is not only that there is no suggestion in the Act, its legislative history, or more than a quarter century of Congressional oversight that the Commission's decisions in licensing proceedings were intended to encompass psychological stress associated with particular licensing actions, it is also that Congress envisioned that the Commission's expert judgments, publicly arrived at, would help serve to prevent or allay public fears.

Petitioner PANE argues that the plain meaning of "health," as defined in the dictionary, encompasses mental health, and that the Atomic Energy Act therefore obligates the Commission to evaluate the psychological effects of allowing the Three Mile Island Unit 1 reactor to resume

operation.² In support of this position, PANE cites judicial decisions in such areas as abortion, zoning, and tort liability.

The meaning of the term "public health and safety", as used in the Atomic Energy Act, was analyzed in detail by the First Circuit Court of Appeals in *New Hampshire v. Atomic Energy Commission*, 406 F.2d 170, cert. denied, 395 U.S. 962 (1969). In that case, the court rejected the contention of the State of New Hampshire that the Commission was required by the Atomic Energy Act to consider the effect on public health of discharges of hot water into the Connecticut River. The State had asserted that such discharges could be harmful to public health by reducing the capacity of the river to assimilate waste. Though the subsequent passage of the National Environmental Policy Act and the Federal Water Pollution Control Act amendments of 1972³ assures that the effects of thermal and other discharges are now fully evaluated before a reactor operating license can be issued, the court's analysis of the statute and its legislative history is no less valid today as a gloss on the meaning of the statutory language.

As in the present case, the petitioners in the *New Hampshire* case argued that the analysis of the scope of the Commission's responsibilities need go no further than a judgment on the "present day plain meaning" of the terms "health" and "safety". The court rejected that proposed approach, stating: "we do not feel that we fulfill our function responsibly by simply referring to the dictionary." 406 F.2d 170, 173. The court explained:

Here we feel a very palpable restriction in the history surrounding the problem addressed by the Congress, the subsequent Congressional confirmation of the limited approach taken by the Commission . . . and a recognition of the complexity of administrative arrangements which would attend a literal definition of public health and safety as these terms are used in the Atomic Energy Act. 406 F.2d 170, 173-174.

The court then stated its conclusion that "[t]he history of the 1954 legislation reveals that the Congress, in thinking of the public's health and safety, had in mind only the special hazards of radioactivity." 406 F.2d 170, 174. It backed up that conclusion with an exhaustive review of the applicable legislative history, and it also traced subsequent actions of

² At the same time, PANE asserts that it would be a "*reductio ad absurdum*" to suggest that psychological effects must be evaluated before nuclear reactors can be licensed to operate for the first time, since "[t]hat type of interpretation could conceivably prohibit reactors virtually anywhere, which is clearly not the intent of Congress." Petitioner's Brief in *PANE v. NRC* [hereinafter "Petitioner's Brief"], pp. 25-26.

³ 42 U.S.C. §4321, et seq. (NEPA); 33 U.S.C. §1251, et seq. (FWPCA).

Congress and the Commission which shed light on the original congressional purpose.

First, the court observed that the Senate and House Reports on the 1954 legislation contrasted conditions in 1946, when the first Atomic Energy Act was passed, with conditions eight years later. In 1946, the Reports said, "there was little experience concerning the health hazards involved in operating atomic plants," whereas by 1954 it had become "evident that greater private participation in power development need not bring with it attendant hazards to the health and safety of the American people." 406 F.2d 170, 174, n. 4, *quoting* Senate Report No. 1699, Vol. I, Legislative History of the Atomic Energy Act of 1954, p. 751; House Report No. 2181, *id.*, p. 999, U.S. Code Congressional and Administrative News, p. 3458. The court found "[v]ery little else on the subject of health and safety . . . in the massive three volume Legislative History." It concluded:

It seems obvious to us that these terms were beyond the purview of the 1954 deliberations and that their meaning had been deemed settled at the time of the passage of the Atomic Energy Act of 1946. 406 F.2d 170, 174, n. 4.

The court then reviewed the legislative history of the 1946 Act. It cited the Senate Report on the bill, which described one of the kinds of authority granted to the Commission by Section 12 of the Act in the following terms:

Establish safety and health regulations to minimize the danger from explosion, radioactivity, and other harmful or toxic effects incident to the presence of such materials. Sen. Rep. No. 1211, U.S. Code Cong. Service, 79th Cong., 2d Sess., 1946, p. 1335.

The court observed that Section 12 of the 1946 Atomic Energy Act spoke more briefly of "danger from explosions and other hazards," and it found "no motive other than one of simplifying language" to explain the deletion of the words "from explosions and other hazards" in the 1954 legislation. 406 F.2d 170, 174 n. 4.

The court observed that the 1954 Act had created a "very special relationship, crystallized in statutory form between the Commission and the Joint Committee on Atomic Energy — a relationship that is rarely embodied in positive law." 406 F.2d 170, 174. The court found that the Joint Committee's interpretation of the Act's purposes supported the view that Congress intended "public health and safety" to include only the "special hazards of radioactivity." The court cited the Joint Committee's first study report on the Act, in which it said:

The special problem of safety in the atomic field is the consequences of the hazards, created by potentially harmful radiations

attendant upon atomic energy operations. Joint Committee Print, A Study of Atomic Energy Commission Procedures and Organization in the Licensing of Reactor Facilities, 85th Cong., 1st Sess., p. 4 (1957), *quoted at* 406 F.2d 170, 174.

The First Circuit commented that the Commission had been consistent in confining itself to the regulation of radiation hazards, and that the Joint Committee had apparently raised no objection to that approach. The court cited the Supreme Court's affirmation of the special significance of the Joint Committee's acquiescence in an action of the Commission:

It may often be shaky business to attribute significance to the inaction of Congress, but . . . considering especially the peculiar responsibility and place of the Joint Committee on Atomic Energy in the statutory scheme, we think it fair to read this history as a *de facto* acquiescence in and ratification of the Commission's licensing procedures by Congress. *Power Reactor Development Corp. v. International Union of Electrical Workers*, 367 U.S. 396, 409 (1961), *quoted at* 406 F.2d 170, 174 n. 5.

The court went on to discuss subsequent amendments to the Atomic Energy Act which illuminated the intent underlying the 1954 Act. In 1959, Congress amended the Act to allow the Commission to relinquish control over some nuclear materials and activities to the States. The statutory language spoke in terms of "protection of the public health and safety from radiation hazards." 42 U.S.C. 2021(b). In defining the authority which the States could assume, Congress was necessarily also defining the authority which the Commission was already exercising.

The court also cited Congress' action in 1965 to amend 42 U.S.C. 2018 of the Act to make clear that the Commission was not subject to control by other governmental agencies, state, local and federal. In its report, the Joint Committee on Atomic Energy described the Commission's regulatory control as "limited to considerations involving the common defense and security and the protection of the health and safety of the public with respect to the special hazards associated with the operation of nuclear facilities." S.Rep. No. 390, 89th Cong., 1st Sess., p. 4, 1965, *quoted at* 406 F.2d 170, 175.

New Hampshire v. AEC, in finding that the Commission's authority was limited to protecting against the "special hazards of radioactivity," plainly supports the Commission's action here, for psychological stress in our society is not peculiar to the generation of electricity through the splitting of atoms.

PANE's argument that the fear of radiation is so uniquely a hazard of radiation that it requires consideration by the Commission is unpersuasive. Presumably, every hazardous technology gives rise to fears peculiarly associated with it: fear of being inundated by failure of a newly con-

structed dam, for example, or of being hit by debris from a crashing airplane. That is not a ground, however, for imposing a statutory duty on the Corps of Engineers, the Federal Aviation Administration, or the Nuclear Regulatory Commission, requiring those agencies to develop expertise in the categories and subcategories of psychological stress associated with the particular technology which each regulates. The Commission's determination that the major contribution which it can make to the alleviation of psychological stress is to make sound technical decisions in its areas of expertise is a wholly reasonable reading of its obligations under the Atomic Energy Act.

PANE also contends that the *New Hampshire* court erred in its reading of the legislative history, and that it improperly narrowed the scope of the Commission's responsibility to protect "health" under the statute. In particular, PANE asserts that the court failed to give proper weight to what it terms "the only relevant pre-enactment legislative history of any significance", *i.e.*, the description of the 1946 Senate Report, quoted above, of Section 12 of the Act. Petitioner's Brief, p. 31. According to PANE, the court failed to consider the significance of the Report's statement that the Commission's duty was to "minimize the danger from explosion, radioactivity and other harmful or toxic effects." PANE emphasizes the phrase "other harmful or toxic effects", contending that it shows Congress' concern with "a full range of harmful effects." PANE asserts that even if the court was correct in holding that the Commission's authority extended only to the "special hazards of radioactivity," the "threat of invisible and unknown radiation" unquestionably falls in that category. Petitioner's Brief, pp. 21-22.

The language on which PANE relies does not support the broad reading of the statute which it urges, but rather the contrary, as the court correctly recognized. Under the *ejusdem generis* principle of statutory construction, where a statute sets forth a list of specific items and then includes a reference to unspecified "other" items, the latter term will be construed as though it read, "other items of like kind."⁴ In the present case, the context makes it apparent that Congress had in mind the physical dangers asso-

⁴ The D.C. Circuit's discussion of the *ejusdem generis* rule of statutory construction in *Association of American Railroads v. United States*, 195 U.S.App.D.C. 371, 603 F.2d 953 (1979), is directly applicable to the present case: "The rule of *ejusdem generis* is a common sense doctrine which teaches: 'Where general rules follow specific words in an enumeration describing the legal subject, the general words are construed to embrace on objects similar in nature to those objects enumerated by the preceding specific words.' 2A Sutherland Statutory Construction §47.17, at 103 (4th ed. 1973) (footnotes omitted); see *Weyerhaeuser Steamship Co. v. United States*, 372 U.S. 597, 600-01, 83 S.Ct. 926, 10 L.Ed.2d 1 (1963); *Cleveland v. United States*, 329 U.S. 14, 18, 67 S.Ct. 13, 15, 91 L.Ed. 12 (1946) ('Under the *ejusdem generis* rule of construction the general words are confined to the class and *may not be used*

(CONTINUED)

ciated with nuclear materials, specifically the risks of explosion and of exposure to radiation, and the reference to "other harmful or toxic effects" can only be interpreted in that light. Psychological distress is sufficiently dissimilar to the types of harm enumerated in the statute that it cannot be considered among the "other harmful or toxic effects" contemplated by Section 12. This is all the more true in view of the total absence of any suggestion in the legislative history or in 35 years of Commission practice and congressional oversight that the Commission was intended to take into account psychological distress alleged to result from its activities.

The fact that Congress did not specifically state whether psychological distress falls within the Commission's authority does not, contrary to PANE's contention, argue for an expansive reading of the statute. Where Congress has intended that an administrative agency should take psychological considerations into account, it has used precise language to express that intent. In the Noise Control Act, for example, the Administrator of the Environmental Protection Agency is authorized to conduct or contract for research that includes "investigation of the psychological and physiological effects of noise on humans and the effects of noise on domestic animals, wildlife, and property, and determination of acceptable levels of noise on the basis of such effects." 42 U.S.C. 4913(1)(A).⁵

In the present case, it is reasonable to suppose that Congress never spoke to the issue of whether the Commission was required to consider

to enlarge it' (emphasis added); *United States v. Stever*, 222 U.S. 167, 174, 32 S.Ct. 51, 53, 56 L.Ed. 145 (1911) ('[u]nless there is a clear manifestation to the contrary, general words, not specific or limited, should be construed as applicable to cases or matters of like kind with those described by the particular words.');

United States v. Brown, 536 F.2d 117, 121 (6th Cir. 1976). A statutory reference to 'other' objects of a general nature . . . most frequently calls for the application of the doctrine." 603 F.2d 953, 963-64. In the present case, PANE is undeniably attempting to use the reference to "other harmful or toxic effects" to enlarge the class of effects reached by the statute to include matters which have never previously been suggested to fall within the scope of the Act.

⁵ Among other statutes in which Congress specifically authorized the agency to take psychological factors into account are the following: the Fire Research and Safety Act of 1968, providing *inter alia* for research into the "biological, physiological, and psychological factors affecting human victims of fire, . . . psychological and motivational characteristics of persons who engage in arson . . . , the conditions of stress encountered by firefighters, the effects of such stress, and the alleviation and reduction of such conditions," 15 U.S.C. 278(f)(2), (f)(2)(E), and (f)(2)(G); the Occupational Safety and Health Act of 1970, "providing for research in the field of occupational safety and health, including the psychological factors involved," 29 U.S.C. 651(b)(5); 1972 amendments to the Elementary and Secondary Education Act of 1965, authorizing grants for projects designed to plan for, test, and demonstrate the effectiveness of programs for Indian children, including those to "meet the special health, social, and psychological problems of Indian children," 20 U.S.C. 887c.(b)(3); and the Rehabilitation Act Amendments of 1974, authorizing programs to "develop new and innovative methods of applying the most advanced medical technology, scientific achievement, and psychological and social knowledge to solve rehabilitation problems," 29 U.S.C. 701(5).

psychological distress because the issue never came up. To the best of our knowledge, this case is the first instance, in the years since the Atomic Energy Act of 1946 was passed, in which the suggestion has been made that the Commission's obligation to protect health and safety included the prevention of psychological distress. If, as PANE seems to argue, the silence of Congress on a particular issue were always to be construed as a mandate to the agency to consider that issue, the result would be to reward petitioners able to frame contentions so far-fetched that they either did not occur to the Congress or were considered too unlikely to warrant discussion.

- B. Even if the Commission's authority were broad enough to permit it to consider psychological health under the Atomic Energy Act, the Commission would not be required to do so, and strong policy considerations counsel against doing so.

We have outlined in the preceding section of this Memorandum and Order our reasons for believing that Congress intended the Commission to confine its regulatory activities under the Atomic Energy Act to the physical hazards of radioactivity, rather than to psychological concerns. At the same time, we are conscious that the Commission, even more than most administrative agencies, has wide discretion to interpret the scope of its mandate and the means of fulfilling its duties. The D.C. Circuit Court of Appeals has commented, in *North Anna Environmental Coalition v. NRC*, that the NRC's regulatory scheme is "virtually unique in the degree to which broad responsibility is reposed in the administrative agency, free of close prescription in its charter as to how it shall proceed in achieving the statutory objectives." 533 F.2d 655, 658-59 (1976) (quoting *Siegel v. AEC*, 400 F.2d 778, 783 (D.C. Cir. 1968)). See also, *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 543 (1978). Even if we believed ourselves to possess sufficient authority to *permit* us to consider psychological health under the Atomic Energy Act — or were found by a reviewing court to have such authority — the same indicia of Congress' overriding concern with the physical hazards of radioactivity which we have outlined above demonstrate *a fortiori* that the Commission is not *required* to consider psychological health under the Act. There are, moreover, substantial policy considerations which argue against considering psychological effects under the Atomic Energy Act.

The primary objective of the Atomic Energy Act was to protect the health and safety of the public from the dangers associated with a civilian nuclear power program by establishing a technical agency with special expertise in radioactivity and its hazards. Congress provided for an expert agency and a public process for resolving questions of nuclear safety so

that safety decisions would be made competently and openly. Viewed in that light, the reduction of psychological stress is a desirable byproduct of open and competent decisions.

A technical agency, whether charged with assuring the safety of dams, airplanes, or nuclear power plants, ought properly to apply itself primarily to the areas in which it is uniquely expert, as Congress intended. A technical agency cannot and should not be expected to devote its resources to developing expertise in the categories and subcategories of psychological stress alleged to be peculiar to the particular technology which that agency regulates. Rather, the protection of the public from psychological distress, including that resulting from fear of various technologies, ought properly be the responsibility of agencies with expertise in the area of mental health.⁶ The major contribution which technical agencies can make to the prevention and alleviation of psychological stress is to make sound technical decisions and to make those decisions available to the public in understandable terms. To require technical agencies with no psychological expertise to address themselves to mental health issues would be doubly undesirable: it would impair the agencies' ability to fulfill their necessary technical responsibilities, while providing no assurance that the public's psychological well-being was entrusted to capable hands.

It may be countered that a technical agency which lacks expertise in a particular area is at liberty to acquire that expertise, either by hiring knowledgeable staff or by retaining consultants. This is undeniable. What is equally undeniable, however, is that in a world of finite resources, the Commission cannot allocate funds and personnel to the evaluation of psychological stress without diverting resources from its major responsibility — that of protecting public health and safety from the radiological

⁶ The Commission took action to bring the issue to the attention of relevant groups. In November 1979, Mitchell Rogovin (Director of the special inquiry group established by the NRC to study the Three Mile Island accident) suggested that some action, perhaps by the National Institute of Mental Health, might be appropriate. The Commission forwarded this recommendation to the Governor of Pennsylvania with the explanation: "Recognizing that the responsibility for the health and welfare of those citizens is shared by the State of Pennsylvania and the Federal Government, the Commission believes that your views would be of the utmost value as we evaluate Mr. Rogovin's recommendation." (Letter from Chairman Joseph M. Hendrie, Nuclear Regulatory Commission, to Governor Richard Thornburgh, Pennsylvania, dated November 30, 1979.) After receiving a generally favorable response from Pennsylvania, the Commission sent a letter to the Department of Health and Human Services relating the background and concluding "the Nuclear Regulatory Commission believes that it would be desirable for your Department to evaluate these proposals and to consider what remedial programs may best address the problems that have been identified. We will direct our staff to provide whatever assistance may be necessary in developing and instituting such programs." (Letter from Chairman John F. Ahearne, Nuclear Regulatory Commission, to Secretary Patricia R. Harris, Department of Health and Human Services, dated April 17, 1980.) The Department of Health and Human Services acknowledged our request and identified some ongoing state and federal efforts which addressed the concerns.

hazards posed by nuclear power plants. In our view, it makes far more sense for the Commission to address itself to the health and safety issues which are the source of public anxieties than to attempt to quantify, analyze, and palliate the anxieties themselves. The Licensing Board, in its certification to the Commission, was only expressing sound common sense when it declared: "Certainly it is true that the best way to minimize any psychological stress in the communities around TMI-1 is to make the plant safe or not allow it to operate." 11 NRC 297, 308.

There are, moreover, issues which by their nature do not lend themselves to resolution in the adjudicatory process. The same reasoning which has led courts to disfavor the consideration of psychological effects under the National Environmental Policy Act is applicable to the adjudication of psychological health under the Atomic Energy Act. Judge Leventhal, writing for the D.C. Circuit in *Maryland-National Capital Park and Planning Commission v. United States Postal Service*, 487 F.2d 1029 (1973), observed:

Some questions of esthetics do not seem to lend themselves to the detailed analysis required under NEPA for a §102(C) impact statement. Like psychological factors they "are not readily translatable into concrete measuring rods." 487 F.2d 1029, 1038.

It may be argued in response to Judge Leventhal's comment that the Commission does in fact make judgments on esthetic matters as part of the NEPA process, and that a body capable of judging the esthetic effects of its decisions should also be capable of judging their psychological effects. That argument would not be valid, however. Although as Judge Leventhal suggested, esthetic factors may be difficult to quantify and describe with analytical precision, ultimately any layman is capable of forming an opinion on a matter of esthetics. By contrast, sound judgments on the probable psychological effects of regulatory decisions would require far more than a layman's opinion. Thus the need for expertise is added to the problems of quantification.

Finally, we believe that whatever discretion the Commission may have in defining "health" under the Atomic Energy Act, the definition it adopts — or which may be established by reviewing courts — will be applicable to every nuclear power plant. We cannot accept the proposition, advanced by petitioner PANE, that the Atomic Energy Act requires the evaluation of psychological health in the vicinity of Three Mile Island, because of the accident there, but that it would be a "*reductio ad absurdum*" to suggest that the Act requires the Commission to examine psychological health whenever it licenses the construction or operation of a reactor. PANE goes on to explain that "[t]hat type of interpretation could conceivably prohibit reactors virtually anywhere, which is clearly not the intent of Congress." PANE Brief, pp. 25-26.

Whatever else Congress may have intended, we cannot believe that it meant that "health" under the Atomic Energy Act, should clearly encompass the psychological well-being of persons fearful of a second nuclear accident in their vicinity, while equally clearly excluding the mental health of persons who fear that their locality may experience its first nuclear accident. On the contrary, it is apparent to us that if the definition of "health" under the Act is held to include psychological health in any proceeding, the inevitable result will be the litigation of psychological health in virtually every licensing proceeding, with effects on the NRC's processes which could only be destructive. It is not merely that the analysis and litigation of psychological stress issues would require the expenditure of resources and time; safety issues also require resources and time, but those expenditures on safety issues contribute to sounder decisions and the better protection of the public. We do not believe that the public well-being, including psychological well-being, would be benefited in any meaningful way if the Commission's Licensing Boards or the Commission itself were to take on the task of weighing, in one licensing proceeding after another, the essentially unprovable claims and counter-claims of competing arrays of mental health experts.

We reiterate, therefore, our conviction that the most appropriate means of taking psychological stress into account in its decisionmaking process is to make sound safety decisions and to publicize fully and accurately the basis for those decisions. In that way, the resources of the Commission can be devoted to the agency's real task — that of protecting the public's health and safety by assuring that licensed nuclear reactors are built and operated safely — rather than diverted to assessing the degree to which members of the public fear those judgments to be incorrect.

The separate views of Commissioner Gilinsky are attached.

For the Commission,

SAMUEL J. CHILK
Secretary of the Commission

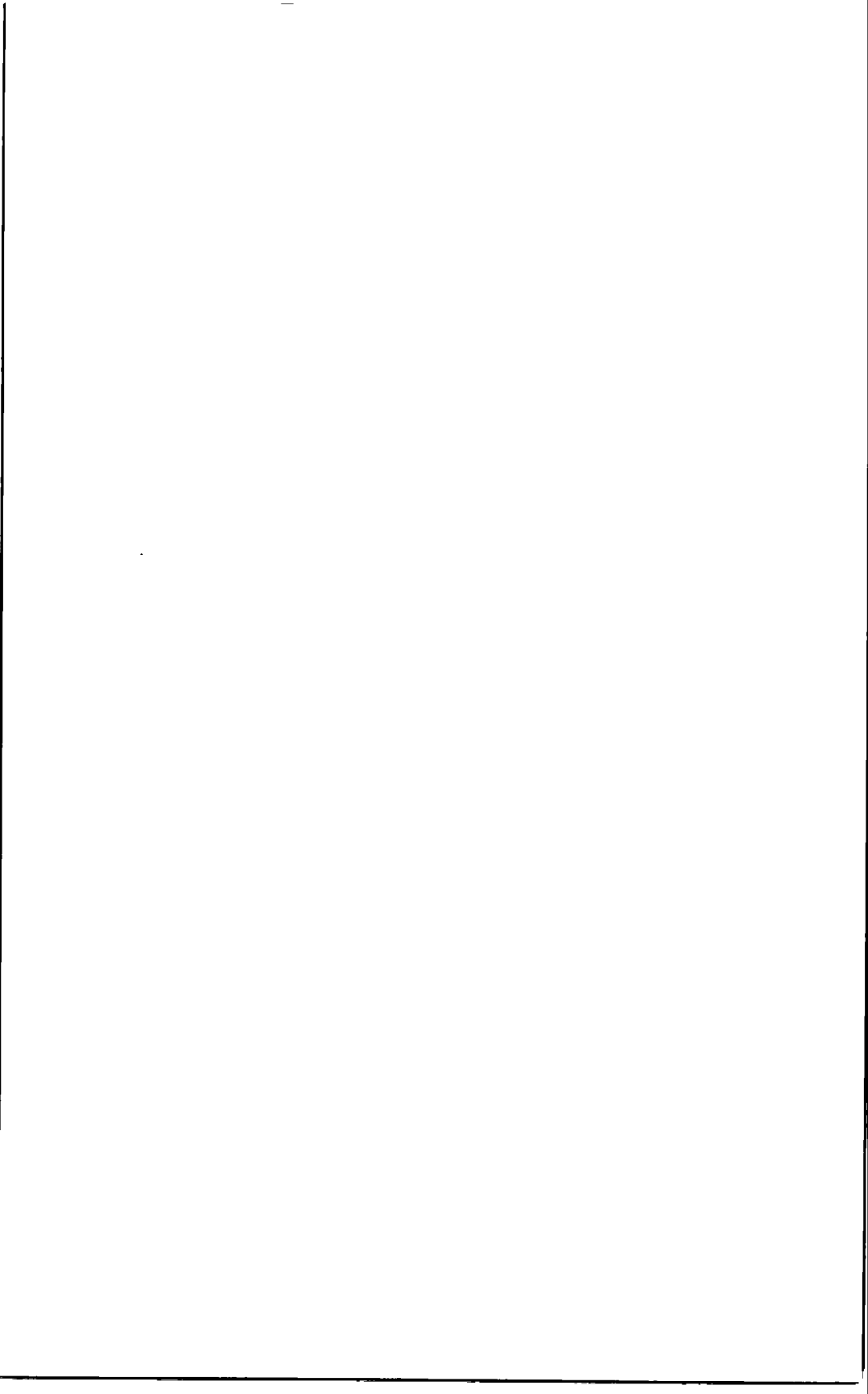
Dated at Washington, DC
this 30th day of March, 1982

SEPARATE VIEWS OF COMMISSIONER GILINSKY

In my view, the Commission has discretion under the Atomic Energy Act to consider psychological health issues raised in connection with the licensing of nuclear power plants. In the TMI-1 restart proceeding, the Commission should have exercised this discretion to admit the psychological stress

contention to the hearing after the Commonwealth of Pennsylvania asked the Commission to consider this issue and the Licensing Board unanimously supported that request. In any other field, such issues would normally be handled by the political process at the State and local level. In light of the Atomic Energy Act's pervasive preemption of State authority regarding nuclear matters, only the Federal Government can deal with them. The Commission, as the representative of the Federal Government, should have made every effort to accommodate the concerns of the Commonwealth.

I do not think that taking up psychological issues after the most serious nuclear power reactor accident in history in any way implies taking them up in every reactor licensing case. In most cases, the public interest would not be served by airing these issues in the Commission's proceedings. These matters are intrinsically difficult to adjudicate and, in any case, largely beyond the Commission's expertise. It is by no means clear that the Commission would be able to deal with them in a satisfactory way. Nonetheless, in the particular circumstances of this case, it would have been wiser for the Commission to have heeded the Commonwealth's concern. What the Commission did, in effect, was to tell the neighbors of this plant that nowhere in the government—local, state, or federal—can the concerns at issue here be considered, short of an act of Congress.



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Alan S. Rosenthal, Chairman
Dr. John H. Buck
Dr. W. Reed Johnson

In the Matter of

Docket Nos. 50-443
50-444

**PUBLIC SERVICE COMPANY OF
NEW HAMPSHIRE, *et al.***
**(Seabrook Station, Units 1
and 2)**

March 3, 1982

Upon remand from the Commission in this construction permit proceeding, the Appeal Board, after receiving additional evidence on the intervenor's methodology for determining the appropriate Safe Shutdown Earthquake (SSE) for the plant and on the staff's methodology for correlating vibratory ground motion with the Safe Shutdown Earthquake, reaffirms its earlier determinations on the SSE for the plant and associated maximum vibratory ground motion; ALAB-422, 6 NRC 33, 54-63 (1977), and ALAB-561, 10 NRC 410, 436-a *et seq.* (1979).

**REGULATIONS: INTERPRETATION (10 CFR PART 100,
APPENDIX A)**

10 CFR Part 100, Appendix A, requires that the seismic design of a nuclear power facility take account of the maximum effective vibratory acceleration which might accompany the determined Safe Shutdown Earthquake for that facility. Appendix A is concerned solely with ground motion which might have an effect on the facility's safety-related structures and components.

TECHNICAL ISSUES DISCUSSED:

Seismic design criteria:

Safe Shutdown Earthquake,
measurement of earthquake size (intensity v. magnitude),
prediction of earthquake intensity/frequency,
formulation of seismic response spectrum,
maximum vibratory ground motion (acceleration).

APPEARANCES

Mr. William S. Jordan and Ms. Lynne Bernabei, Washington, D.C., for the intervenor, New England Coalition on Nuclear Pollution.

Messrs. Thomas G. Dignan, Jr., and R. K. Gad III, Boston, Massachusetts, for the applicants, Public Service Company of New Hampshire *et al.*

Mr. Roy P. Lessy for the Nuclear Regulatory Commission staff.

DECISION ON REMAND

On September 25, 1980, by a divided vote the Commission remanded to us this construction permit proceeding involving the Seabrook nuclear facility in New Hampshire. CLI-80-33, 12 NRC 295. The instructions given us were (1) to reopen the record to receive additional evidence on certain seismic issues; and (2) in the light of that evidence, to reconsider the conclusions we reached on those issues in ALAB-422, 6 NRC 33, 54-65 (1977) and ALAB-561, 10 NRC 410, 436-a *et seq.* (1979).

In compliance with that directive, we held a further evidentiary hearing last April, in which the applicants, the intervenor New England Coalition on Nuclear Pollution and the NRC staff participated. On the basis of the disclosures at that hearing, together with the proposed findings of fact of the respective parties, we have reconsidered our prior conclusions. For the reasons stated in this opinion, we find no cause to disturb them.

I.

A. The background of the seismic remand was summarized in ALAB-623, 12 NRC 670, 672-675 (1980), in which we denied the Coalition's motion to suspend the Seabrook construction permits *pendente lite*. For convenience, we repeat that summary here.

1. In an initial decision issued in 1976, the Licensing Board authorized the issuance of construction permits for the Seabrook facility. LBP-76-26, 3 NRC 857. The decision prompted appeals by several of the parties, including the Coalition. A principal question presented by the Coalition's appeal was addressed to the Licensing Board's application of the seismic and geologic siting criteria for nuclear power plants which are contained in Appendix A to 10 CFR Part 100.

At the root of those criteria is the "Safe Shutdown Earthquake" (SSE) concept. As recently reemphasized:²

The SSE for a particular site is that earthquake "which is based upon an evaluation of the maximum earthquake potential considering the regional and local geology and seismology and specific characteristics of local subsurface material" and "which could cause the maximum vibratory ground motion at the site" 10 CFR Part 100, Appendix A, §III(c), §V (a). The nuclear power plant must be designed so that, should the SSE occur, "certain [specified safety] structures, systems, and components will remain functional". *Id.*, §VI(a)

In short, the SSE is the earthquake postulated for the purpose of determining the adequacy of the seismic design of the facility. The plant has to be capable of being safely shutdown despite the effects of whatever vibratory ground motion might be experienced at the site as a result of the SSE. (One of the elements of the SSE determination is, of course, an ascertainment of the amount of such motion (*Id.*, V(a)).)

Before the Licensing Board, the applicants and the NRC staff had adduced evidence in support of their position that the Seabrook SSE had a maximum Intensity of VIII (measured on the Modified Mercalli scale) and that the vibratory ground motion (acceleration) which might be experienced at the site as a result of that earthquake would not exceed 0.25g.³ For its part, the Coalition had asserted (1) that the SSE should at a minimum be a Modified Mercalli Intensity IX; and (2) that, even for an Intensity VIII SSE, an acceleration value of approximately 0.4g should be assigned. For these propositions the Coalition had relied *inter alia* upon,

¹ On the strength of that authorization, the permits were issued on July 7, 1976. Their effectiveness was later twice suspended for periods of time for reasons unrelated to the matters now before us. With respect to the first suspension, see ALAB-366, 5 NRC 39, as modified in CLI-77-8, 5 NRC 503 (1977); ALAB-423, 6 NRC 115 (1977). As to the second suspension, see CLI-78-14, 7 NRC 952, 957-60 (1978); CLI-78-17, 8 NRC 179 (1978).

² *Dairyland Power Coop.* (La Crosse Boiling Water Reactor), ALAB-618, 12 NRC 551, 552 (1980).

³ The acceleration associated with an earthquake is expressed in terms of a percentage of "g" (one g represents the gravitational acceleration of a free falling body).

respectively, (1) the probabilistic hypothesis advanced by one of its witnesses, Dr. Michael A. Chinnery; and (2) the testimony of another Coalition witness, Dr. Mihailo Trifunac. On the basis of its appraisal of the record, in its initial decision the Licensing Board had resolved the issue in favor of the applicants and the staff. In other words, it had found that the Seabrook facility need be designed so as to be capable of being shutdown safely in the event of a Modified Mercalli Intensity VIII earthquake producing an acceleration at the site of 0.25g. LBP-76-36, *supra*, 3 NRC at 868-71, 919-22.

Challenging this result, the Coalition complained to us of the rejection of the contrary conclusions of Dr. Chinnery and Dr. Trifunac. By a divided vote, this Board turned the challenge aside. As the majority saw it, Dr. Chinnery's probabilistic theory was both technically deficient and inconsistent with Appendix A to 10 CFR Part 100. ALAB-422, *supra*, 6 NRC at 57-60. With respect to the matter of the maximum acceleration which an Intensity VIII earthquake might occasion at the Seabrook site, the majority determined that the analytic approach of the staff's principal witness (Dr. Nathan M. Newmark) — which had led to the assignment of the 0.25g value — was preferable to that of Dr. Trifunac. *Id.* at 62-64.

Viewing the matter differently, Mr. Farrar⁴ noted his dissent from this disposition of the seismic question and thus from the affirmance of the Licensing Board's authorization of the issuance of the Seabrook construction permits. 6 NRC at 106 *et seq.*⁵ Instead of filing a full opinion at that time, however, he confined himself to a summary statement of his own conclusions with the notation that he would later file a supplemental opinion detailing the reasoning underlying his position.

2. On August 10, 1977, the Coalition filed a petition for Commission review of ALAB-422. On September 15, 1977, the Commission announced that it would defer its determination whether to grant review on the seismic issues to await Mr. Farrar's supplemental opinion.⁶ That opinion was rendered in August 1979 and prompted a response the following month from the Appeal Board majority. ALAB-561, 10 NRC 410.

Acting on a Commission invitation, the Coalition filed a supplemental memorandum on September 26, 1979 in support of that portion of its petition for review of ALAB-422 which dealt with the seismic issues. The Commission was advised, *inter alia*, that, subsequent to his testimony

⁴ By reason of his resignation in 1980 from full-time service on the Appeal Panel, Mr. Farrar no longer is a member of this Board.

⁵ All other issues raised by the Coalition and the other appellants were resolved in ALAB-422 in the applicants' favor. Jurisdiction was retained, however, over one question which this Board had raised *sua sponte* — a question which did not bear upon whether the facility should be built. 6 NRC at 104-05.

⁶ The remainder of ALAB-422 was affirmed in CLI-78-1, 7 NRC 1 (1978).

before the Licensing Board, Dr. Chinnery had undertaken certain seismological studies under NRC contract and had reported the results of those studies to the NRC staff in 1978 and 1979. According to the Coalition (supplemental memorandum, pp. 10-11), Dr. Chinnery's reports provided a sufficient answer to the criticism which had been leveled in ALAB-422 against his probabilistic analysis (and reiterated in the Appeal Board majority's response in ALAB-561 to Mr. Farrar's full dissent).

Following its receipt of the rejoinders of the other parties to the Coalition's supplemental memorandum, the Commission called for an oral briefing by the parties, which took place on May 29, 1980. At that briefing, the Commission heard (albeit not under oath) from Dr. Chinnery, as well as from a panel of staff members and a technical representative of the applicants.

In the wake of the briefing, the Coalition requested that the adjudicatory record be supplemented by the inclusion of the two reports Dr. Chinnery had prepared for the NRC and the stenographic transcript of the oral presentations. This request was opposed by the applicants and the NRC staff on the principal ground that the Commission's Rules of Practice precluded the granting of such relief.

In its remand order, CLI-80-33, *supra*, the Commission denied the Coalition's request for the reason that it was both granting review of ALAB-422 and ALAB-561 and calling upon this Board to reopen the record on the matters dealt with in the Chinnery reports and at the briefing.⁷ With respect to the earthquake intensity question, the Commission concluded that (1) the majority of this Board had erroneously determined that Dr. Chinnery's methodology was inconsistent with Appendix A to 10 CFR Part 100; and (2) the "factual validity of Dr. Chinnery's hypothesis" required "greater exploration on the record" in light of the substantial time interval since his testimony before the Licensing Board in 1975 and the "subsequent publication of Dr. Chinnery's works and general increase in seismic knowledge". 12 NRC at 296-297. Regarding the acceleration question, the Commission perceived a need for additional evidence as to "the consistency of Appendix A and staff's methodology for correlating vibratory motion with the SSE". *Id.* at 298.

B. At the hearing on remand, Dr. Chinnery and Dr. Trifunac once again testified.⁸ In addition, testimony was received from Richard J. Holt on behalf of the applicants and a panel of staff witnesses comprised of

⁷ The briefing had covered both the earthquake intensity and the acceleration questions.

⁸ At the Coalition's request, Dr. Trifunac was called as a Board witness because of his then status as a consultant to the Advisory Committee on Reactor Safeguards. Given that status, he preferred not to appear as a witness for a party to the proceeding. As before the Licensing Board, Dr. Chinnery testified on behalf of the Coalition.

James P. Knight, Robert E. Jackson and Dr. Leon Reiter. Following the hearing, the parties filed proposed findings of fact in accordance with an agreed schedule approved by us. The last such submission was received in August.

In Part II of this opinion, *infra*, we deal with the first of the questions identified in the Commission's remand order: the acceptability of Dr. Chinnery's methodology for determining the intensity value which should be assigned to the Seabrook SSE. Then, in Part III, we shall move on to consider the second question: whether the staff's methodology for correlating vibratory motion with the SSE is consistent with Appendix A to 10 CFR Part 100.

II.

As was noted in ALAB-422, *supra*, 6 NRC at 57, Dr. Chinnery is not satisfied with the determination of the seismic design of nuclear facilities based upon the size of the largest recorded historical earthquake in the particular area. Rather, as he sees it, one should go beyond the reported historical earthquakes in that area and, through a form of statistical analysis, endeavor to ascertain the likelihood of occurrence of an earthquake of yet greater intensity.

In his prepared testimony furnished to the Licensing Board in 1975,⁹ Dr. Chinnery discussed the ingredients of his probabilistic approach as applied to the Seabrook site. As he explained, his first step was to ascertain from a review of historical earthquake data, the number of earthquakes of Intensities III through IX which had occurred in three regions of the United States — Boston-New Hampshire, Mississippi Valley and Southeastern United States.¹⁰ For each of those regions, he then plotted the probability per year of the occurrence of an earthquake of each intensity level between III and IX.¹¹ According to Dr. Chinnery, this produced essentially straight line graphs with roughly the same slopes for all three areas for earthquakes of or greater than Intensity IV. This led him to conclude that the probability of an earthquake at or above the Intensity IX level could be ascertained by a linear extrapolation of the three curves and, most particularly, that for the Boston-New Hampshire region. Using such an extrapolation, Dr. Chinnery arrived at the further conclusion that "the probability of an Intensity IX or greater event [in New England] lies somewhere

⁹ NECNP Exh. 10, admitted into evidence fol. Tr. 3101. As employed herein, "Tr." refers to the transcript of the proceedings below and "R.Tr." to the transcript of the hearing on remand which we conducted.

¹⁰ In the case of the Boston-New Hampshire region, Dr. Chinnery found no earthquake of greater than Intensity VII. *Id.* at p. 1.

¹¹ *Id.* at Figure 1.

between 0 and 10^{-3} per year," which was coupled with the observation that "my assessment of the evidence leads to a number near the high end of this range."¹²

In his prepared testimony submitted to us in connection with our hearing on the remand,¹³ Dr. Chinnery elaborated upon his theory. As part of that elaboration, he illuminated the basic philosophy underlying his probabilistic approach in a discussion entitled "Frequency — Intensity Relationship."¹⁴

The characterization of the seismicity of a province in terms of the rates of occurrence of earthquakes of different sizes is usually accomplished using frequency-magnitude or frequency-intensity relationships. In the present case we use the latter, since only intensities are quoted in the Smith catalog. In addition, we use cumulative frequency-intensity counts, i.e., we count the number of earthquakes larger than or equal to a given intensity value during a given period.

The extraction of frequency-intensity data from a catalog such as Smith's must be carried out with care, since the completeness of the catalog at lower intensities is likely to be a strong function of population density, and therefore of time. We use the approach described in Chinnery and Rodgers 1973 (Exhibit 1) here.

Having extracted and plotted the data for the Boston-New Hampshire seismic zone, we have three important questions to consider:

- (i) can the data be represented by a linear frequency-intensity relationship?
- (ii) if so, what is the slope of the linear relationship?
- (iii) is there some upper bound to the intensity of earthquakes that can be expected in this seismic zone? Let us consider each of these in turn.

In addition to those questions, the justification for the use made by Dr. Chinnery of the historical data to determine the likelihood of occurrence of an earthquake of greater size necessitates consideration of a fourth ques-

¹² *Id.* at p. 4.

¹³ That submittal took the form of Direct Testimony (denominated a "Statement") and Rebuttal Testimony, both admitted into evidence fol. R.Tr. 218. The Direct Testimony was accompanied by, *inter alia*, two papers published by Dr. Chinnery:

Exhibit 1 - Chinnery and Rodgers, *Earthquake Statistics in Southern New England*, 44 Earthquake Notes 89 (1973).

Exhibit 2 - Chinnery, *A Comparison of the Seismicity of Three Regions of the Eastern U.S.*, 69 Bull. of the Seismological Society of America 757 (1979).

They will be hereinafter identified as Chinnery Exhs. 1 and 2.

¹⁴ Direct Testimony, at pp. 7-8.

tion as well: whether there is validity to his required assumption that that data can be linearly extrapolated to include larger seismic events.

Each of the four questions was addressed at the remand hearing. In Part A, we summarize the testimony of the parties; following that, in Part B, Dr. Chinnery's methodology will be examined against the background of that testimony.

A. Summary of the evidence presented by the parties

1. Representation of seismic data by a linear frequency-intensity relationship

In his direct testimony (at p. 10), Dr. Chinnery stated that "[t]he vast majority of seismologists have accepted the linearity of frequency-magnitude¹⁵ data as a working hypothesis";¹⁶ he went on to acknowledge, however, that that hypothesis "has no clearly developed theoretical basis". With regard to the "linearity" of frequency-intensity relationships, he testified that there has been "much less" discussion but that, "of what scientific literature there is, the vast bulk assumes that [such] relationships are linear."¹⁷ On cross-examination, however, he conceded that most of the scientists utilizing the linear frequency-intensity hypothesis do so for the purpose of classifying seismic regions, and not as a method of predicting maximum earthquake intensity (R.Tr. 64).

Notwithstanding these considerations, Dr. Chinnery has elected (see Chinnery Exh. 1) to "use intensities throughout" because of "the nature of the historical data".¹⁸ And, as he sees it, there is no need to justify

¹⁵ Emphasis supplied. As will be later discussed (pp. 436-37, *infra*), "Magnitude" refers to the size of an earthquake as measured by an instrumental method. "Intensity", on the other hand, refers to earthquake size as subjectively measured by its observed effects. The intensity concept was first employed long before the availability of seismic instrumentation.

¹⁶ Dr. Chinnery's employment of the term "linearity" in this context is open to misunderstanding. The relationship between earthquake frequency and magnitude is generally expressed by the equation $\text{Log } N_c = A - bM$, in which N_c is the number of earthquakes of magnitude M or greater per unit time. Because, as shall be seen (p. 436, *infra*), M is a logarithmic scale, graphical representation of this equation would be a log-log curve. It is the log-log relationship that Dr. Chinnery assumes to be linear.

¹⁷ On this score, Dr. Chinnery's employment of "linearity" is even more troublesome. The plots he used to show a frequency-intensity relationship are plots of equations in the form of $\text{Log } N_c = a - bI$. If I is a linear scale, then the plot is log linear. But if I is a logarithmic scale as assumed by Dr. Chinnery in his 1973 paper (Chinnery Exh. 1), then the plot is log-log. In either case, the equation makes the fundamental assumption that I is a uniform scale (see fn. 19, *infra*).

The nature of the plots is of more than passing academic interest. The shape of a plotted curve depends strongly on the type of graph used to make the plot. Dr. Chinnery agreed that his data points would have produced a sharply-curved line if plotted against linear axes (R.Tr. 261).

¹⁸ This, of course, refers to the fact that, except for very recent years, seismic data were exclusively reported in terms of the effects of earthquakes, *i.e.*, intensity.

analytically his assumption that the frequency-intensity relationship is a linear one. The assigned reason was that it has a recognized empirical foundation (R.Tr. 302-03).¹⁹

By way of illustration, Dr. Chinnery took historical earthquake data from four areas of the United States²⁰ to plot $\log N_c$ per year vs. intensity curves.²¹ These plots are shown in Figure 1 on the following page, which is a reproduction of a figure in his 1979 paper (see Chinnery Exh. 2, Figure 8 at p. 766). It is his thesis that these plots show that the $\log N_c$ per year vs. intensity is linear for the range Intensity IV and above.²²

Dr. Chinnery's data used in plotting the curves were not taken from the same period of time for each region — nor for the same length of time for each curve.²³ He stated with regard to the Southeastern United States region that he wished "to get away from the worst of the aftershocks" of the large earthquake of 1886 (Charleston); accordingly, he arbitrarily started with the year 1900 (R.Tr. 183). Respecting the Mississippi Valley region, "the large earthquakes there happened in 1811, 1812 (New Madrid) so I can go back further and there my intensity file goes back to 1870" (*ibid*). However, data for Intensities VI through IX are listed in his Table 2 as beginning in 1840. He admitted that the 1800 cut-off for the New England data was arbitrary (R.Tr. 59).

¹⁹ Nonetheless, Dr. Chinnery did endeavor, see Chinnery Exh. 1, pp. 93-95, to formulate a relationship between earthquake frequency and intensity by a two-step analytic process. He first noted that "it appears in general to be possible to relate the maximum epicentral Intensity I to the local magnitude M by a linear algebraic expression $M = 1 + \frac{3}{5} I$ taken from a paper by B. Gutenberg and C.F. Richter (Bull. of Seismological Society of America, Vol. 46, No. 2, 1956)". From this, Dr. Chinnery concluded that "[i]f a linear relationship exists between magnitude and intensity * * * then clearly we can write $\log N_c = c - dI$."

The only mention in the 1956 paper by Gutenberg and Richter of a possible linear relationship between magnitude and intensity is at p. 131, where they state that "[i]n Figure 5 the data for I_0 and M are correlated. The resulting empirical equation $M = 1 + \frac{3}{5} I_0$ differs only slightly from the corresponding equation in Paper 1." In his later book *Elementary Seismology* (1958), Richter notes at p. 140 that, in such equations, "[I]ntensity grades must be treated as true numerical quantities which they are not." (See also pp. 437-38, *infra*.)

²⁰ The areas used were Mississippi Valley, Southeastern United States, Southern New England and Boston-New Hampshire.

²¹ As earlier noted (fn. 16, *supra*), N_c represents the number of earthquakes producing an Intensity I or greater during a particular time period.

²² Noting the fact that low intensity data are incomplete and that the higher intensity data may be too sparse to be reliable, Dr. Chinnery also presented straight line representations of the data in each region (i.e., of the form $\log N_c = a - bI$). The slopes of these lines, determined for the four regions mainly by the frequency of earthquakes of Intensities IV to VII, lie in the range 0.54 to 0.60 (Chinnery Exh. 2, at p. 765).

²³ The actual time periods used by Dr. Chinnery were (Exh. 2, at pp. 760, 761, 764):

	III	IV	V	VI or greater
Southeastern United States	1930-1969	1900-1969	1900-1969	1900-1969
Mississippi Valley	1900-1969	1870-1969	1840-1969	1840-1969
Southern New England	1928-1959	1900-1959	1860-1959	1800-1959
Boston-New Hampshire	1928-1959	1900-1959	1860-1959	1800-1959

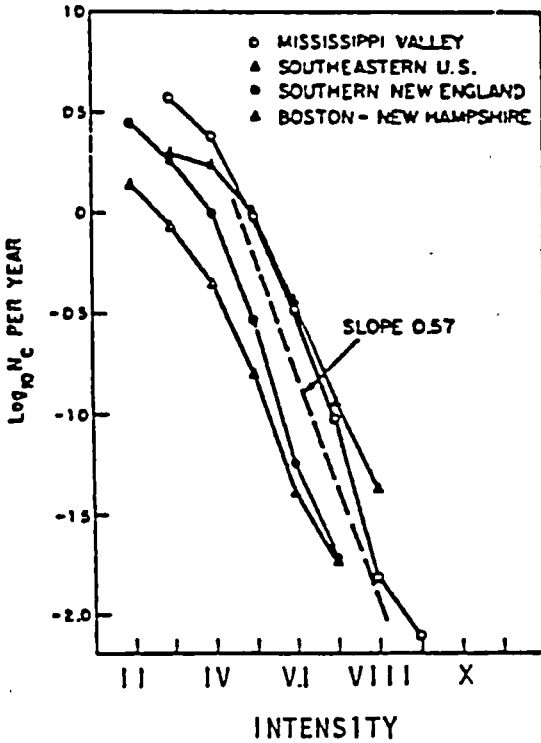


Figure 8. Comparison of the frequency-intensity data from Figures 2, 4, and 7. [Chinnery Exh. 2, Figure 8]

FIGURE 1

Dr. Chinnery also conceded that he had excluded data on Intensity III and below and had not investigated the sensitivity of the purported linearity of the N_c - intensity relationship to the omission of this data. Moreover, he had used data from Smith's Earthquake Catalogue without determining the accuracy of the data or whether late work had resulted in changes in the intensity values used by Smith (R.Tr. 54-55; see also fn. 44, *infra*).

The staff and applicants' witnesses were critical of Dr. Chinnery's conclusion that a linear representation of the frequency-intensity data is the most desirable way to display this information. They noted that many other functional relationships (e.g., truncated linear, bilinear and higher order) have been used to represent these data (Reiter, fol. R.Tr. 493, at p. 4; Holt, fol. R.Tr. 349, at p. 3). Dr. Reiter observed:

Yegian (1979) has discussed these [relationships] in recent summary of probabilistic approaches to seismic hazard analysis. New forms of frequency magnitude relationships are continually being proposed. An examination of the six issues of the *Bulletin of the Seismological Society of America* for 1980 alone indicates three different generic approaches to determining the relationship between earthquake magnitude or intensity and frequency. (Bloom and Erdmann, 1980; Berrill and Davis, 1980; and Makjanic, 1980). The linear assumption is a first order or rough approximation which may be adequate for generalized arguments but clearly requires great scrutiny and possibly higher order terms in detailed descriptions such as return periods for earthquakes of high intensities.

Reiter at p. 5.

For his part, Mr. Holt stated that Dr. Chinnery's arbitrary choice of time frames for the various seismic regions eliminated years of earthquake data that, if included, would produce drastic changes in Dr. Chinnery's results (Holt, fol. R. Tr. 349, at p. 2). Specifically, had that data been included, for each of the areas selected by Dr. Chinnery the consequence would have been curves which were non-linear at the high intensity end:

For the three cited cases, Mississippi Valley, Charleston, La Malbaie, the high intensity end of the curve does not follow a linear pattern; it does not have a "stable" slope. There are several possible explanations for this:

The observation period fortuitously includes the large earthquakes and if we looked at a much longer time period their probability level would be much lower (or their return period much longer). This is the explanation Dr. Chinnery has chosen when he uses the "linearity" of the smaller events.

The points may be fitted by another type curve or there are different slopes for the smaller earthquakes than for the larger

earthquakes; for the European area different slopes can be fit to different regions (Karnik, 1969) and, in some regions, two slopes fit the data much better than one.

The curve changes slope with time and/or the earthquakes are not uniformly distributed in time and therefore not predictable at any probability level from the limited time base we have.

Id. at p. 3.

In the same vein, Dr. Reiter pointed out that “* * * you can fit many many straight lines, many many higher order curves, bilinear curves to that data set” (R.Tr. 512).

2. Uniform slope or “b” value

Dr. Chinnery testified that the only study concerning the variation of the slopes of the frequency-intensity relationship from region to region was his own 1979 paper.²⁴ In that paper, he concluded that, in the four eastern United States areas there studied, the “frequency-intensity plots that we have considered show a remarkable uniformity. All show a pronounced linearity, and have slopes which are consistent with a value of about 0.57.”²⁵

In rebuttal, Dr. Reiter maintained that other studies of the linear relationship between earthquake frequency and intensity show “a wide range of b values has been reported.”²⁶ For example, a study by Algermesian and Perkins (1976) computed b values for 71 regions in the United States and found them to range from 0.24 to 0.76.²⁷ Dr. Reiter asserted that even a variation of the value of b from 0.45 to 0.57 results “in a variation of about 0.8 in site intensity associated with a return period of 10,000 years * * * which utilizing the trend of the means of Trifunac and Brady (1975) * * * implies 75% increase in ground acceleration.”²⁸

Figure 5 contained in Mr. Holt’s testimony is a plot of frequency vs. intensity for two regions in South Carolina and was taken from a paper published in 1977 by A.C. Tarr.²⁹ One curve on the plot shows the data for

²⁴ Direct Testimony, at p. 11. That paper accompanied the testimony as Exhibit 2 (see fn. 13, *supra*).

²⁵ In this regard, Dr. Chinnery stated that the slope of his linear projection for the Boston-New Hampshire region was determined by the slope for the data for the other eastern United States regions because the data for the Boston-New Hampshire region were very sparse (R.Tr. 48-49). On cross-examination, he acknowledged that the Intensity VII data point (derived from three events in a 160-year period) that he plotted as slightly above his graph line was in error. That data point should have been lower, reflecting a single event in that period. He indicated, however, that this error would not affect his conclusions (R.Tr. 128-9, 139).

²⁶ Reiter, fol. R.Tr. 493, at p. 5.

²⁷ *Ibid.*

²⁸ *Id.* at p. 6.

²⁹ Holt, fol. R.Tr. 349, at p. 13.

the highly seismic region in the vicinity of Charleston;³⁰ the other reflects the data for the rest of that state. The slope of the first curve — for the smaller, more seismically active, region — is markedly different (less steep) than the slope of the second.

3. Existence of an upper bound to the intensity of earthquakes that can be expected in a seismic zone

Dr. Chinnery admitted that “the question of the existence of upper bounds to maximum earthquake intensity (less than the scale maximum of XII) remains unanswered” (Chinnery Exh. 2, at p. 771). But he believes “that a rational conservative approach to the estimation of the seismic risk at a site would include the possibility of events with Intensity X or more anywhere in Eastern United States.” *Ibid.* This conclusion rested on extrapolation of the frequency-intensity data to intensities higher than those historically recorded. We discuss such extrapolation in Section 4, *infra*, pp. 435-36.

On the other hand, Mr. Holt asserted that Dr. Chinnery’s curves of earthquake frequency vs. intensity “do not tell us that there is or is not a regional ‘upper-limit’ earthquake.” He maintained that “in any given region the available stress and nature of existing earthquake structures may be such that only a small or intermediate earthquake will be produced.” Mr. Holt also testified that there is no geologic evidence of large earthquakes in New England — as there is in areas known to be seismically active. In particular, he pointed to the area around New Madrid, Missouri (Holt, fol. R.Tr. 349, at pp. 4-5; see also Appendix 3 to his testimony).

Dr. Reiter agreed with this assessment, adding that most seismologists believe that estimates of maximum likely earthquakes in a given area can be obtained only by the use of a combination of “instrumental and historical seismicity, local and regional tectonic history, geologic structure, stress measurements and, when possible, fault parameters such as dimension and slip rate” — none of which tools had been alluded to in Dr. Chinnery’s direct testimony (Reiter, fol. R.Tr. 493, at pp. 6-7).

In his rebuttal testimony (at pp. 11-12), Dr. Chinnery expanded somewhat on his theories concerning the upper bounds to earthquake sizes. He pointed out that a recent paper by Liu and Kanamori (1980) “examined 5 mid-plate earthquakes and their results * * * .” These events had es-

³⁰ An area which provided many of the seismic events included in Dr. Chinnery’s Southeastern United States region. See Chinnery Exh. 2 at p. 760.

timated fault dimensions ranging from 10km² to 100km², with seismic moments³¹ found to be between 10²⁵ and 10²⁶ dyne-cm. The corresponding stress drops³² were found to range from 100 to 1000 bars — unusually high compared to the interplate earthquakes which, according to Dr. Chinnery, have stress drops in the range of 10 to 100 bars. Dr. Chinnery concluded from this that mid-plate earthquakes may have small dimensions but, because of their stress drops, may have magnitudes in the range of 7 to 7.5 (which he equates to an epicentral Intensity of X.) He added that “in my opinion there is no sound geological basis for saying that New England is in some way an unusual mid-plate region”; *i.e.*, he thought that area to be similar to the five areas studied by Liu and Kanamori. On this basis, Dr. Chinnery reached the “professional judgment” that

a magnitude 7 (M_S) earthquake may well occur rarely in the Boston-New Hampshire zone, at a depth that may be as little as 5 to 10 km. Furthermore, I feel it will be a long time before we get enough new information that we will be able to revise this estimate. As near as I can estimate, a magnitude 7 earthquake at a depth of 10 km would lead to a surface intensity of at least X.

Id. at p. 13.

On cross-examination, however, Dr. Chinnery stated that his value of magnitude 7 to 7.5 M_S for the earthquakes in the Liu and Kanamori study was obtained by his own method of estimation and had not taken into account the much lower magnitude values (M_S 5.5 to 6.3) of the mid-plate earthquakes actually presented in the Liu and Kanamori paper.³³ Although he had calculated Modified Mercalli values equivalent to M_S 7 to 7.5 for the purposes of his rebuttal testimony and had read other papers which gave relationships between various magnitudes and intensity values, he declined to give any estimate of the Modified Mercalli values which would correspond to earthquakes in the range of M_S 5.5 to 6.3 (R.Tr. 166-170).

By way of response to Dr. Chinnery, Dr. Reiter observed that actual measurements of stress drop had been made for earthquakes in New England using techniques similar to those of Liu and Kanamori, which had

³¹ Because earthquakes are caused by rupture and sliding along fault surfaces in the earth, the net effects of an earthquake can be measured in terms of the amount of slip and the area (*i.e.*, the length times depth of the fault) over which it took place. The product of the slip (*u*), the fault area (*A*) and the rigidity (*μ*) of the surrounding rocks is taken to be the “seismic moment” (M₀); *i.e.*, M₀ = *uμA*.

³² “Stress drop” is the change (decrease) in the rock stresses on either side of the fault before and after the earthquake.

³³ R.Tr. 164. Dr. Chinnery’s exact statement was: “what you were pointing out is absolutely right, that is, they have magnitude values already in that paper which I obviously didn’t go [sic], I went through too fast to see.”

provided results of less than 50 bars (R.Tr. 556-7). And Mr. Jackson offered his observation that the rocks in New England are heavily jointed and cracked and, thus, would more likely produce small fault areas and earthquakes (R.Tr. 562-3). Although Mr. Jackson admitted his observations were made near the surface, and not at the depth of 10 km or so at which fault ruptures might occur (*id.*), he noted that geologists would generally expect to find uniformity in depth of rock structure (R.Tr. 565). In any event, Mr. Jackson believed that his observation on rock structure in New England was supported by the finding of low stress drops for earthquakes measured in the region (R.Tr. 587-8).

Regarding the possibility of an upper bound of earthquakes, Mr. Holt cited another intraplate region, England and Scotland, where, in a thousand years of data, the largest earthquake intensity measured has been Intensity VII. (R.Tr. 401). He went on to state that there was no geological evidence of large earthquakes in the New England area, such as capable faults. This is in marked contrast to the Mississippi Valley (New Madrid) region, where numerous signs of early intense earthquakes are to be found. (Holt, fol. R.Tr. 349, at pp. 4-5, Appendix 3).³⁴

4. The extrapolation of the relationship between earthquake frequency and intensity to earthquake intensities greater than any historically recorded in the area under consideration.

On the basis of his assumptions that there is a "linear" relationship between the frequency of earthquake occurrence and intensity, and that the slope of the line representing this relationship is constant throughout the eastern United States, Dr. Chinnery asserted that the relationship can be linearly extrapolated to predict the frequency of occurrence of earthquakes larger than those historically recorded (Direct Testimony, p. 12). For New England, he expressed the opinion that the linear relationship indicated by his data could be extended on a conservative basis to at least Intensity X. *Id.* at p. 13. The single articulated basis for this opinion was that five out of 10 seismologists had suggested that the largest earthquake to be expected in the Cape Ann area of Massachusetts (which is in the Boston-New Hampshire zone as described by him) might possibly be as high as Intensity X. *Id.* at pp. 12-13. In Exhibit 2 to his Direct Testimony, Dr. Chinnery maintained that, in the higher seismic areas of Charleston (Southeastern United States) and New Madrid (Mississippi Valley), the extrapolation would be valid to Intensities IX and X, respectively. (Chinnery Exh. 2, p. 771).

³⁴ There is no residual evidence of past earthquakes in the Charleston, South Carolina region, due (at least in part) to the deep overburden found there (R.Tr. 406).

On this matter, as well, staff and applicant witnesses took issue with Dr. Chinnery's thesis (see *e.g.*, Reiter, fol. R.Tr. 493, at pp. 8-9; Holt, fol. R.Tr. 349, at pp. 2-3). That disagreement centered upon his limited use of the available data. Dr. Chinnery had relied on the data given in Smith's Catalogue of Earthquakes, even though he admitted that much of the catalogue data was questionable (Direct Testimony, at pp. 4, 7; Rebuttal Testimony, at p. 14). Further, he had not investigated the accuracy of the Smith data that he had employed nor had he taken into account the re-evaluation in other studies of some of the seismic events he had utilized (R.Tr. 53-55; 128-133).

With respect to the linear extrapolation of the Modified Mercalli scale beyond Intensity VIII, Dr. Reiter emphasized that:

While Intensity VII earthquakes have occurred in many parts of the Central and Eastern U.S., Intensity VIII earthquakes have occurred in much fewer locations. Intensity IX or greater events have only occurred at four locations in eastern North America, the New Madrid Missouri Zone, Charleston South Carolina, La Malbaie, Quebec and the Grand Banks off of Newfoundland.

Reiter, fol. R.Tr. 493, at p. 8.

In the same vein, the frequency-intensity curves to which he alluded in his testimony (see pp. 431-32, *supra*) persuaded Mr. Holt that "the curve in the historical time period is not linear at the high intensity end" (Holt, fol. R.Tr. 349, at p. 3).

B. Analysis of the evidence

1. An evaluation of the evidence adduced respecting Dr. Chinnery's probabilistic hypothesis requires some understanding of the two recognized bases for measuring the size of an earthquake — magnitude and intensity.
 - a. Defining earthquake size in terms of magnitude is a relatively recent development, the concept having originated in 1931 in Japan and then further developed for California earthquakes by Charles Richter in 1935.³⁵ Magnitude is determined by instrumental measurements and is understood to be

the logarithm to base ten of the maximum seismic wave amplitude (in thousandths of a millimeter) recorded on a standard seismograph at a distance of 100 kilometers from the earthquake epicenter.³⁶

³⁵ Bolt, *Earthquakes - A Primer* (1978), at 104.

³⁶ *Ibid.*

Thus, each additional unit of magnitude as represented on the scale devised by Dr. Richter (and named after him) reflects a ten-fold increase in the amplitude of the earthquake waves.³⁷

Although the original Richter Magnitude scale was essentially a local one with application to Southern California earthquakes alone, this measurement method is now employed worldwide with the aid of various types of seismographs.³⁸

- b. In contrast, earthquake intensity — as now reflected on the Modified Mercalli scale — is not instrumentally measured. Indeed, the intensity concept originated long before instruments had been devised for the measurement of earth movement; *i.e.*, at a time when the size of an earthquake could be assessed only in terms of its observed effects. Measurements in intensity terms thus have a markedly subjective element; this becomes clear from the generally accepted standards utilized in determining the value on the Modified Mercalli scale which should be assigned to the earthquake.³⁹ It is also apparent from those standards that, although the steps in the scale from I to XII represent progressively larger earth motion, no basis exists for an assumption that the increase from step to step either is uniform or follows any particular mode of variation.
2. In short, the Modified Mercalli scale uses the effects on man and man-made structures to give a word picture of the size of the earthquake causing those effects. It provides a useful means for determining the characteristics of the magnitude of seismic events for which no instrumental data are available. Nonetheless, the scale must be used with caution, for the ground motion

³⁷ *Ibid.*

³⁸ *Ibid.*

³⁹ As described in Richter, *Elementary Seismology* (1958), at 136-38:

- I. Not felt. Marginal and long-period effects of large earthquakes.
- II. Felt by persons at rest, on upper floors, or favorably placed.
- III. Felt indoors. Hanging objects swing. Vibration like passing light trucks. Duration estimated. May not be recognized as an earthquake.
- IV. Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes. In the upper range of IV wooden walls and frame creak.

(CONTINUED)

and damage associated with any given earthquake may vary greatly depending upon local conditions (e.g., whether the situs of the earthquake has a rock or, instead, a soil foundation).⁴⁰

When questioned by us respecting the basis for his assumptions that the Modified Mercalli scale is consistently uniform throughout its range, Dr.

-
- V. Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.
 - VI. Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls, Furniture moved or overturned. Weak plaster and masonry D cracked. Small bells ring (church, school). Trees, bushes shaken (visibly, or heard to rustle—CFR).
 - VII. Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to masonry D, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices (also unbraced parapets and architectural ornaments—CFR). Some cracks in masonry C. Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.
 - VIII. Steering of motor cars affected. Damage to masonry C; partial collapse. Some damage to masonry B; none to masonry A. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
 - IX. General panic. Masonry D destroyed; masonry C heavily damaged, sometimes with complete collapse; masonry B seriously damaged. (General damage to foundations—CFR.) Frame structures, if not bolted, shifted off foundations. Frames racked. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluviated areas sand and mud ejected, earthquake fountains, sand craters.
 - X. Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
 - XI. Rails bent greatly. Underground pipelines completely out of service.
 - XII. Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.
Masonry A. Good workmanship, mortar, and design; reinforced, especially laterally, and bound together by using steel, concrete, etc.; designed to resist lateral forces.
Masonry B. Good workmanship and mortar; reinforced, but not designed in detail to resist lateral forces.
Masonry C. Ordinary workmanship and mortar; no extreme weaknesses like failing to tie in at corners, but neither reinforced nor designed against horizontal forces.
Masonry D. Weak materials, such as adobe; poor mortar; low standards of workmanship, weak horizontally.

⁴⁰ In his prepared testimony at p. 1 and p. 4, Mr. Holt discussed this point and, in Appendix 1 to that testimony, provided numerous illustrative examples. See also Bolt, *supra* fn. 35, at 101-102, for the observation that landslides, which are used as an indication of Intensity X earthquakes, can be caused by very slight seismic activity, depending on the terrain.

Chinnery acknowledged that "scientifically it [intensity] is very hard to use and to define." He further stated in his 1973 paper (Chinnery Exh. 1) that there's a plot of some data of magnitude against intensity and I'm not saying it proves very much.

There is clearly a lot of scatter there nevertheless * * * . Now, that * * * diagram in my '73 paper goes up to Intensity VIII. Whether the intensity scale continues to be linear beyond that I agree is a problem.

R.Tr. 223.

Apart from his use of the intensity scale levels as if they reflected true numerical quantities, which they manifestly do not, Dr. Chinnery's approach is replete with questionable scientific methodology. We have already noted his arbitrary selection of time periods when comparing various geologic areas of the United States. See pp. 429-32, *supra*. A yet more troublesome problem stems from Dr. Chinnery's selection of the four regions to be studied for the purposes of his analysis — a choice which necessarily has a decided bearing upon the reliability of his results and their usefulness in assigning earthquake risk.

Two of those selected regions are relatively large in area: Southeastern United States (307,000 km²) and Mississippi Valley (250,000 km²).⁴¹ Within those regions, there are much smaller areas of very high seismicity — Charleston and New Madrid, respectively — which have contributed a large percentage of the seismic events which have taken place in the region.⁴² Yet, in plotting his frequency-intensity curves for those regions, he used data from the entire region. See p. 429, *supra*. As we have seen, however, there is uncontroverted evidence that, at least in South Carolina, the slope of the curve is significantly influenced by whether the data employed are from a region of high, or instead low, seismicity. See pp. 432-33 *supra*.

The two other selected regions are considerably smaller in overall area: Southern New England (100,000 km²) and Boston-New Hampshire (27,000 km²).⁴³ More importantly, a much greater percentage of those regions are seismically active. This is especially true of the Boston-New Hampshire region which is entirely encompassed within the Southern New England region and, as its boundaries were arbitrarily drawn by Dr. Chinnery, is very irregular in shape and appears to include the principle seismic areas in eastern Massachusetts and the southern portion of New Hampshire. It might be noted that Dr. Chinnery acknowledged that he had selected that region because it had "somewhat more seismicity than

⁴¹ Chinnery Exh. 2, at pp. 758, 760.

⁴² R.Tr. 279; Holt, fol. R.Tr. 349, Fig. 5A; Chinnery Exh. 2 at pp. 759, 761.

⁴³ Chinnery Exh. 2 at p. 761.

the rest of New England" (R.Tr. 278). It thus would appear that, in making that selection, he employed different criteria than that which undergirded his choice of the other three regions. In these circumstances, it is of little, if any, significance that Dr. Chinnery's frequency-intensity curves for the four regions have similar slopes.

Moreover, as earlier noted (p. 435, *supra*), in using the paper by Liu and Kanamori to support his belief that there is no limit on the intensities of mid-plate earthquakes, Dr. Chinnery disregarded the earthquake magnitudes found by the authors and instead substituted much higher values of his own. Still further, his claim that the New England area is geologically and seismologically similar to the five mid-plate areas studied by Liu and Kanamori is without foundation (R.Tr. 145). In this connection, it is noteworthy that Dr. Chinnery conceded that he had made no analysis himself of relevant seismic records nor had he calculated stress drops for any New England earthquakes (R.Tr. 171); that the only stress measurements he knew of were taken in drill holes at depths of no more than 2000 feet (R.Tr. 199); and that, because he had not personally kept up with the record of intensities of recent New England earthquakes, he did not know if they indicated small area, high stress events (R.Tr. 201-202). Nor had he examined the spectra obtained from New England earthquakes to see how they compared with earthquake spectra in other areas (R.Tr. 202-203).⁴⁴ These admissions obtain yet greater significance when taken in conjunction with the statement made by him in response to questions by the Licensing Board concerning the possibility that the New England earthquakes might not show surface faulting because their focus might be deeper than that of California earthquakes:

No. As I said, I personally suspect that it's because they are smaller. The stresses which are built up in an area like New

⁴⁴ In this connection, as earlier noted (fn. 25, *supra*) Dr. Chinnery now accepts the recent reevaluation which reduced the number of Intensity VII events which have occurred in the Boston-New Hampshire region from three to one (an 1817 earthquake has been downgraded from VII to VI and two Intensity VII events which took place a few days apart in December 1940 near Ossipee, New Hampshire are now treated as having been a single earthquake and its aftershock). Nevertheless, as also noted, Dr. Chinnery expressed the view that this reduction does not affect the slope of his line for this region, which had been founded on a VII data point which assumed three events of that intensity.

We think otherwise. The computation of the VII data point on the basis of a single event, instead of three events, produces a value of $\log N_c$ equal to -2.2 rather than -1.72 and that value lies well below Dr. Chinnery's proposed linear curve (see Chinnery Exh. 2, Fig. 7, at p. 765). Moreover, the treatment of the Ossipee events as a single Intensity VII earthquake (R.Tr. 139, 272) requires a reduction in the cumulative number of events included in the Intensities VI and V data points (which encompass all events of that or greater intensity). Using the corrected data, all of the points beyond Intensity V plotted on Dr. Chinnery's Boston-New Hampshire graph (Fig. 7) fall below his straight line and the apparent slope of the plotted data is no longer consistent with his linear projection.

England are almost certainly much higher than the stresses which are built up in California. And it's like a very small, very intent bomb, if you like. We can contain a lot of energy within a small space in an environment like New England. This is not possible in California; earthquakes are very much larger, it's not surprising that they very nearly always penetrate the surface in California.

Tr. 4048-49.

Even were there not these infirmities in Dr. Chinnery's methodology, it still would not provide a basis for determining the SSE for the Seabrook site. As plotted by Dr. Chinnery, the magnitude of the frequency vs. intensity curve (*i.e.*, the position of the line relative to the vertical axis) is dependent upon the total number of events in the particular region providing the data base, without regard to the area of that region. As reflected by the curves found in Figure 1, *supra*, p. 430, one consequence is that the number of events of a given intensity to be expected per year in the Mississippi Valley and Southeastern United States regions would exceed (by a factor of approximately 10) those in the Boston-New Hampshire region.

Nonetheless, upon our inquiry Dr. Chinnery stated that he was not prepared to assign a factor-of-10 greater seismic risk to a hypothetical nuclear power plant site in western Alabama (within the Southeastern United States region) than he would assign to a specific site within the Boston-New Hampshire region (R.Tr. 280-285). He explained that in order to equate the *areal* seismic risk with that existing at a certain site within the area, one would have to make a subjective assessment of the areal data and be informed as to the particular characteristics of that site (R.Tr. 286-88). Accordingly, Dr. Chinnery explicitly acknowledged that his methodology could only be employed to determine the seismic risk in the *region* in which the Seabrook site is located and that his testimony therefore did not address the probability of earthquake intensity at the *site itself* (R.Tr. 288-89). In these circumstances, there is little basis for the Coalition's claim (at p. 33 of its proposed findings of fact) that the areal earthquake probability which Dr. Chinnery had computed for the Boston-New Hampshire region perforce must be applied to the Seabrook site.

In sum, we are compelled to conclude that Dr. Chinnery's methodology has not been shown to be a credible means of predicting the intensity of seismic motion at a particular site. Leaving aside the just discussed admitted limitations affecting its usefulness, we have seen that, had he employed relatively uniform criteria in the selection of regions and time periods for the purposes of his probabilistic analysis, the results would have been materially different from those which he presented and would have refuted his postulated linear frequency-intensity relationship. Once again,

his thesis that the Seabrook facility should be designed to withstand an earthquake of an intensity greater than any historically recorded earthquake in the New England region rests entirely upon his assertion of such a linear relationship.⁴⁵

III.

We now turn to the second question before us: whether the staff's methodology for correlating vibratory ground motion (acceleration) with the safe shutdown earthquake is consistent with the requirements of Appendix A to 10 CFR Part 100. See p. 426, *supra*. By a divided vote, we had given an affirmative response to that question in ALAB-422, *supra*. In calling upon us to consider it further on the remand, the Commission did not discuss the analysis which led to that response. Rather, it simply stated that "more evidence" should be taken on the question and that, "[i]n particular, the parties should provide a discussion of the relation between the mean of the maximum ground accelerations and the maximum effective ground acceleration." CLI-80-33, *supra*, 12 NRC at 298.

In the circumstances, it may reasonably be presumed that the concern which prompted the Commission's remand on the acceleration issue had its roots in Mr. Farrar's view, in dissent from the majority conclusion in

⁴⁵ Contrary to the Coalition's claim in its proposed findings, we find nothing in the record to indicate that Dr. Chinnery's methodology has received peer acceptance. More particularly, we do not agree that Dr. Trifunac's testimony endorsed Dr. Chinnery's proposed linear projection as a means of forecasting recurrence rates of earthquakes higher than those historically recorded. See R.Tr. 750-52.

Nor can we adopt the Coalition's proposed finding that certain testimony of Mr. Holt establishes that Intensity XII should be assigned to the Seabrook SSE. In this testimony, Mr. Holt referred to an apparent correlation between earthquakes which occurred off of Cape Ann, Massachusetts in 1727 and 1755 and the existence in that area of an intrusive (pluton) with northeasterly trending incapable faults. (R.Tr. 381-92; 425-28). He also took note of the similar coincidence of an intrusive and a fault in the New Madrid area, where seismic events possibly as high as Intensity XII occurred in 1811-12 (R.Tr. 403-04). Leaving aside the fact that the Holt theory respecting the significance of intrusives is not accepted by the United States Geological Survey (R.Tr. 430, 552-553) — or, insofar as we are aware, by any other authorities —, it does not point to the conclusion which the Coalition would draw from it. This is because Mr. Holt (1) additionally alluded to a significant seismological difference between the Cape Ann and New Madrid areas (R.Tr. 405); and (2) expressed the opinion that the coincidence of an intrusive and a fault in the Cape Ann area would not occasion an earthquake greater than magnitude 6 (which represents an intensity of approximately VIII) (R.Tr. 388-89). In this connection, it should be noted that the Cape Ann earthquakes have never been thought to have exceeded Intensity VIII and that at least the 1755 one is now regarded in many quarters as of Intensity VII. See ALAB-422, *supra*, 6 NRC at 57, 62. Further, Coalition counsel did not endeavor to cross-examine Mr. Holt respecting his stated belief that, his intrusive theory notwithstanding, the maximum earthquake to be expected in the Cape Ann area is an Intensity VIII.

ALAB-422, that the staff's approach to the correlation of earthquake intensity and acceleration levels does not comport with Appendix A. See ALAB-561, *supra*, 10 NRC at 431. On that premise, to place the evidence adduced on remand in its proper context, we start with a review of what was said in ALAB-422 and ALAB-561 on the subject based upon the content of the record which had been developed before the Licensing Board.

A. As seen from those decisions, the witnesses testifying below on the intensity-acceleration correlation did not disagree respecting the arithmetic mean value of the acceleration peaks which would be associated with an Intensity VIII earthquake.⁴⁶ Employing the same basic data (much of which had been collected by Dr. Trifunac himself), the witnesses all expressed the opinion that that value was not in excess of 0.25g. ALAB-422, 6 NRC at 62.

The controversy centered instead upon whether a 0.25g mean value should be used in the design of the Seabrook facility. As summarized in ALAB-422, *id.* at 62-63:

Dr. Trifunac pointed out that there is a wide variation in the value of the acceleration peaks included in the calculation of the mean. He noted that the standard deviation was approximately 50 percent of the mean value. He therefore suggested that the "reasonable upper bound" for the design horizontal acceleration should be the mean value plus one standard deviation, or approximately 0.4g. (NECNP Exh. 8, p. 3).

The other witnesses uniformly expressed the contrary view that 0.25g was an acceptable design value for the Seabrook facility. Dr. Newmark testified without contradiction that the highest acceleration peaks are associated with the highest frequency ground waves. These high frequency waves would be fully recorded by the relatively small and compact seismographs, but yet would have no significant effect on the large massive structures of a nuclear facility (Newmark Dir. Test., fol. Tr. 2813, p. 7). Thus, included in the mean of the acceleration peaks are a number of high frequency peaks which can be discounted insofar as this facility is concerned.

Our analysis of these divergent opinions culminated in an affirmance of the Licensing Board's acceptance of the 0.25g value. Several factors prompted that result.

First we read Section VI(a) of Appendix A as requiring the employment for design purposes of the *effective* "maximum vibratory acceleration

⁴⁶ As the term has uniformly been used in this proceeding, "mean" refers to the arithmetic mean or average of the values under consideration.

at the elevations of the foundations of the nuclear power plant." On this interpretation, we saw no regulatory bar to the exclusion from consideration of high frequency waves which would have no discernible impact upon the facility (*i.e.*, were not "effective" — which in turn would make resort to the mean of the peak accelerations sufficiently conservative. *Id.* at 63.

Second, we referred to a table supplied by Dr. Trifunac in conjunction with his testimony below, which provided data for peak accelerations as a function of intensity in the western United States.⁴⁷ That table reflected a mean horizontal peak acceleration for an Intensity VIII earthquake of approximately 0.167g with a standard deviation of slightly more than 0.08g — *i.e.*, a combined value of almost precisely 0.25g. These data thus lent support for the 0.25g design value consistent with Dr. Trifunac's view that, because it serves to compensate for the fact that the maximum peak acceleration exceeds the mean, a standard deviation should be added to the latter. *Id.* at 63-64.

In this connection, we took note of the reason assigned by Dr. Trifunac for adopting a mean value of 0.25g rather than 0.167g: that peak accelerations at hard rock sites (such as Seabrook) are considerably greater than those at alluvium sites.⁴⁸ As we saw it, however, that explanation was countered by the additional consideration that the record further disclosed that the increased peak accelerations at hard rock sites are occasioned by high frequency ground waves which do not affect heavy concrete structures. *Id.* at 64.

For his part, both in his brief dissent to ALAB-422 and in the later elaboration of his views in ALAB-561, Mr. Farrar agreed that Appendix A is concerned with the greatest "effective" vibratory acceleration which might result from the occurrence of an earthquake of the predicted intensity. 6 NRC at 113; 10 NRC at 431-32. He also acknowledged that "the evidence seemingly left no room for doubt that the extremely high frequency waves which can cause the highest accelerations are of such short duration and low energy that they will have no real consequences". 10 NRC at 432. Nonetheless, in his judgment, the utilization of the mean of the peak accelerations was forbidden by Appendix A. Pointing to the fact that the record disclosed that the peak acceleration values being averaged differ from each other by as much as a factor of ten, he expressed the view that "the average of all of them has no demonstrable

⁴⁷ The table now appears as Table 3 in Trifunac and Brady, *On the Correlation of Seismic Intensity Scales With the Peaks of Recorded Strong Ground Motion*, 65 Bull. of the Seismological Society of America 139, 146 (1975). This article is discussed further, *infra*, p. 446.

⁴⁸ The data in his table had been derived from accelerations associated with varying geological conditions.

relationship to the maximum effective acceleration that occurred during the one earthquake where damaging accelerations were the highest". *Id.* at 434.

For this reason, Mr. Farrar rejected not only the majority's acceptance of the approach of the applicants and staff, but also that of the intervenor Coalition. (On the latter score, he opined that "taking the 'mean of the peaks plus one standard deviation' * * * suffers (although to a lesser extent) from the same defective rationale as does use of the mean itself". *Ibid.*) Rather, what he thought to be required was a different kind of analysis, said to have received our approval in *Consolidated Edison Co.* (Indian Point Station, Units 1, 2 and 3), ALAB-436, 6 NRC 547, 584-85 (1977). Specifically, he would have called for an evaluation of the frequency spectrum associated with individual peak accelerations on seismograms for the purpose of obtaining "the highest *magnitude* associated with the frequencies in the damaging range. The magnitude thus determined would serve as the value representative of the particular intensity in question; in other words, it would be correlated with the intensity scale in the same manner that the 'mean of the peaks' currently is". 10 NRC at 436-h, fn. 12.

The majority's rejoinder to this thesis was that there are insufficient available base data applicable to the New England region to permit its adoption. In this connection, it noted that only one New England earthquake (the 1755 Cape Ann event) is generally acknowledged to have been possibly of intensity VIII. *Id.* at 436-g, 436-h. Further, the majority reiterated its belief that the methodology of the staff and applicant is not proscribed by Appendix A and that the addition of the error factor (standard deviation) advocated by the Coalition was unwarranted. *Id.* at 436-h.

B. Against this background, we proceed to the additional evidence adduced on the remand on the question whether the staff's methodology for correlating vibratory ground motion with the safe shutdown earthquake comports with Appendix A requirements. On this issue, as on the intensity question, the staff presented the testimony of a panel of witnesses consisting of Messrs. Knight and Jackson and Dr. Reiter. Dr. Trifunac testified as a Board witness.⁴⁹

In essence, the staff witnesses elaborated upon the description of staff procedures which had been provided the Licensing Board several years ago (*i.e.*, there does not appear to have been a significant alteration in those procedures during the intervening period).⁵⁰ Once the safe shutdown earth-

⁴⁹ The applicants' witness on the intensity question (Mr. Holt) did not appear as a witness on the acceleration issue although some of his prepared testimony touched upon that issue.

⁵⁰ In part, these procedures are outlined in Regulatory Guide 1.60 (Revision 1, December 1973), entitled "Design Response Spectra for Seismic Design of Nuclear Power Plants."

quake for the particular reactor site has been ascertained (in this instance a seismic event of Intensity VIII), the next step is the determination of the peak acceleration which is associated with that earthquake.

For this purpose, the staff now utilizes a relationship between intensity and peak accelerations which had been suggested by Trifunac and Brady in an article published in 1975.⁵¹ In that article, the authors had employed the largest data base then available with regard to earthquakes in the western United States to calculate the mean value of peak acceleration in each intensity class. They then drew a straight line to indicate a trend for the calculated means of the acceleration values.⁵² Although not expressly stated in the article, Figure 3 and Table 1 therein⁵³ reflect that the trend line would indicate a peak acceleration value of 0.25g for Intensity VIII. As previously noted, however, the recorded data indicated that the *actual* mean of the peak accelerations for that intensity level was 0.167g, with a standard deviation of approximately 0.08g. See p. 444, *supra*; see also R.Tr. 645, 649. This discrepancy may explain the admonition in the article that "these average trends [should not] be used to derive the expected peak values of ground motion in terms of Modified Mercalli intensities." Rather, according to Drs. Trifunac and Brady, "if a result of this type is desired, we do recommend that [all available data on ground acceleration, velocity and displacement] be considered and that the peak values be selected on the basis of a pre-defined degree of conservatism."⁵⁴

Having selected a peak acceleration for the SSE on the basis of the trend line of Trifunac and Brady (despite the authors' admonition not to do so), the third step in the staff methodology is the selection of a response spectrum.⁵⁵ This spectrum determines the level of response to ground motion that is to be expected over the entire range of frequencies. For Seabrook, the shape of the response spectrum used was that of the standard spectrum of Regulatory Guide 1.60, *supra* fn. 50. As described

⁵¹ See fn. 47, *supra*. The entire content of the article was before the Licensing Board as an appendix to his testimony (introduced into evidence as NECNP Exhibit 8 at Tr. 3101).

⁵² Trifunac and Brady, *supra* fn. 47, at 147.

⁵³ *Id.* at 143.

⁵⁴ *Id.* at 149.

⁵⁵ A response spectrum is the result of an analytical procedure whereby a number of one-degree-of-freedom harmonic oscillators, each having the same degree of damping but with different natural frequencies, are driven by the time-dependent motion characteristic of a real or postulated seismic event. For a particular event and degree of damping there will be a time-dependent response which varies for oscillators of the different frequencies. The maximum values of the response of the oscillators in terms of acceleration, velocity and displacement, may be plotted as a function of the frequency of the oscillators being excited. Such a plot can be produced for any one of the three parameters taken individually. Because of the relationship among acceleration, velocity and displacement under harmonic motion, a tripartite plot showing the maximum responses in acceleration, velocity and displacement as a function of oscillator frequency may also be prepared (see e.g., Regulatory Guide 1.60, *supra* fn. 50, Figure 1). *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-644, 13 NRC 903, 924 fn. 40 (1981).

by Dr. Reiter, that spectrum "is essentially the mean plus one sigma spectral shape derived after normalizing a series of earthquake records to the same peak acceleration or high frequency response." Reiter, fol. Tr. 493, at p. 18. The very high frequency (at least 30 cycles per second), or anchor point, of the spectrum was set by the staff to be equivalent to the peak acceleration that had been selected for the Seabrook SSE (*i.e.*, 0.25g for Intensity VIII).

In summary, as applied at Seabrook, the staff's methodology progressed from characterization of a safe shutdown earthquake for the site, through the selection of a peak acceleration for that earthquake, to the formulation of a response spectrum — the latter being a device which is intended to establish, at every frequency, the maximum level of response to ground motion representative of the SSE.

What we are called upon to decide, then, is whether this approach comports with the Appendix A requirement that the seismic design of a nuclear power facility take account of the maximum effective vibratory acceleration which might accompany the determined SSE for that facility (as seen from the background statement, pp. 442-45, *supra*, there is no present disagreement that the Appendix is concerned solely with ground motion which might have an impact on the facility's safety-related structures and components).⁵⁶

As we see it, resolution of that issue necessitates going beyond the foreshortened statement posed to us by the Commission of "the relation between the mean of the maximum ground accelerations and the maximum effective ground acceleration" (see p. 442, *supra*). For the selection

⁵⁶ At this juncture, it may be helpful to recite the two pertinent portions of Appendix A.

V. SEISMIC AND GEOLOGICAL DESIGN BASES

(a) *Determination Design Basis for Vibratory Ground Motion.*

(1) Determination of Safe Shutdown Earthquake.

- (iv) The earthquake producing the maximum vibratory acceleration at the site, as determined from paragraph (a)(1)(i) through (iii) of this section shall be designated the Safe Shutdown Earthquake for vibratory ground motion, except as noted in paragraph (a)(1)(v) of this section. The characteristics of the Safe Shutdown Earthquake shall be derived from more than one earthquake determined from paragraph (a)(1)(i) through (iii) of this section, where necessary to assure that the maximum vibratory acceleration at the site throughout the frequency range of interest is included. * * *

VI. APPLICATION TO ENGINEERING DESIGN

- (a) *Vibratory ground motion-(1) Safe Shutdown Earthquake.* The vibratory ground motion produced by the Safe Shutdown Earthquake shall be defined by response spectra corresponding to the maximum vibratory accelerations at the elevations of the foundations of the nuclear power plant structures determine [sic] pursuant to paragraph (a)(1) of Section V. * * *

of a peak acceleration is but a step along the way. The staff's ultimate representation of the SSE is the response spectrum, which perforce encompasses a measure of the motion of the SSE at *all* frequencies. The peak acceleration value is employed simply to anchor that spectrum, and should be viewed in that context. (See Jackson, fol. R.Tr. 493, at p. 10; Reiter, fol. R.Tr. 493, at p. 18). In this regard, the selection of a peak acceleration and the use of it to determine the anchor point of a standard spectrum is but one of many ways to arrive at a response spectrum characteristic of the SSE (Reiter, at p. 19; R.Tr. 635).⁵⁷

Thus, in the last analysis, the acceptability of the staff's methodology in terms of Appendix A hinges upon whether that methodology does, in fact, produce a response spectrum at Seabrook which properly reflects the maximum vibratory acceleration, throughout the frequency range of interest, for the Intensity VIII event which has been selected for the SSE.

The staff witnesses testified that they used the Trifunac and Brady relationship between acceleration and intensity to select an anchor point acceleration because the combination of that anchor point acceleration and the Regulatory Guide 1.60 spectrum shape provides a conservative result (that is, it exceeds, by about one standard deviation, the spectrum that actually would be expected should the SSE be experienced at the site). Jackson, fol. R.Tr. 493, at pp. 14-15; R.Tr. 705-708. As a demonstration that this is so, they presented a comparison of the Seabrook response spectrum with several response spectra representative of Intensity VIII (Reiter, fol. R.Tr. 493, at pp. 15, 23-25, Figures 1, 2 & 3). The Seabrook spectra exceeded these spectra, and exceeded the mean plus one standard deviation (*i.e.*, one sigma) spectra where that was displayed. The testimony of applicants' witness Holt also demonstrated that the Seabrook spectrum exceeds the "one plus sigma" spectrum determined from a worldwide set of strong motion records for a range of epicentral Intensities, VII to XI, with a mean value IX (the Seabrook Intensity is VIII) (Holt, fol. R.Tr. 349, at pp. 6-7, Figures 9, 10, Table 1).

Finally, the Seabrook spectrum was subject to a test of its conservatism by the method favored by Dr. Trifunac.⁵⁸ He used probabilistic methods to determine Uniform Risk Spectra—spectra for which there is a constant probability that the plotted value will be exceeded in a 50 year period. To obtain probabilistic estimates of the seismicity at the Seabrook site, Dr. Trifunac used the projection of Dr. Chinnery (modified to yield events per

⁵⁷ Dr. Reiter noted that, were more data available, it would be preferable to have response spectra obtained for the SSE directly, rather than going to the intermediary step of a peak acceleration. (Reiter, fol. R.Tr. 493, at p. 19).

⁵⁸ Trifunac, fol. R.Tr. 729, at 8-9, Figs. 3 and 4.

1000 km²), and a pessimistic version of that projection. For the former, Dr. Trifunac computed that there would be less than a 5% chance of the Seabrook spectrum being exceeded in 50 years, even if the maximum earthquake intensity for the region was assumed to be XII.⁵⁹ Using the pessimistic seismicity estimate, those probabilities were assessed at less than 5% and less than 30%, for assumed regional maximum Intensities of VIII and XII respectively.

From these results, Dr. Trifunac himself concluded that:

The above probabilistic calculations suggest that the proposed SSE design spectra for Seabrook site (corresponding to 0.25g peak acceleration) may be acceptable. However, before I can finalize this conclusion, I would have to carry out additional and more detailed calculations to find whether [his model of seismicity] is indeed a "sufficiently pessimistic" representation of possible seismicity during the next 50 years.⁶⁰

On the basis of all of the foregoing evidence, it is reasonable to conclude that the methodology employed by the staff at Seabrook, which included using the appropriate mean peak acceleration of Trifunac and Brady as the anchor point for a Regulatory Guide 1.60 spectrum, provides an upper level, or maximum, characterization of the range of ground motion to be expected in the event of an Intensity VIII event. This being so, we are satisfied that the methodology does not offend Appendix A.

For the foregoing reasons, we reaffirm our determination in ALAB-422, *supra*, that the Seabrook safe shutdown earthquake is of Intensity VIII with an associated maximum vibratory ground motion of 0.25g.

It is so ORDERED.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the Appeal Board

⁵⁹ Dr. Trifunac agreed that an earthquake which resulted in motions which exceeded the design response spectrum at some frequency range would not necessarily lead to an accident. R.Tr. 760. See also Reiter, fol. R.Tr. 493, at pp. 24-25.

⁶⁰ Trifunac, fol. R.Tr. 729, at p. 10. Our review of Dr. Trifunac's method indicates that it already contains certain conservatisms (*i.e.*, is pessimistic). For example, Figure 1 of his current testimony indicates a mean value of peak acceleration for an Intensity VIII event of about 0.3g. Table 1 of the Holt testimony (see p. 448, *supra*) gives the mean value of 13 earthquakes in the Intensity range VII to XI as about 0.14g, and the mean plus one sigma value about 0.2g. See also, p. 446, *supra*.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL PANEL

Administrative Judges:

Alan S. Rosenthal, Chairman
Dr. John H. Buck
Thomas S. Moore

In the Matter of

Docket Nos. STN 50-488
STN 50-489
STN 50-490

DUKE POWER COMPANY
(Perkins Nuclear Station,
Units 1, 2 and 3)

March 24, 1982

In response to a motion filed by the applicant with both the Licensing and Appeal Boards for (1) leave to withdraw without prejudice its application for construction permits and (2) termination as moot of the still ongoing proceeding on that application, the Appeal Board defers to the Licensing Board to pass upon the motion in the first instance, and vacates on the ground of mootness three partial initial decisions in this construction permit proceeding (LBP-78-25, 8 NRC 87 (1978); LBP-78-34, 8 NRC 470 (1978); LBP-80-9, 11 NRC 310 (1980)).

RULES OF PRACTICE: MOTIONS (WITHDRAWAL OF LICENSE APPLICATION)

Where a motion for leave to withdraw a license application has been filed with both an appeal and a licensing board, it is for the licensing board, if portions of the proceeding remain before it, to pass upon the motion in the first instance.

APPEARANCES

Mr. Albert V. Carr, Jr., Charlotte, North Carolina, for the applicant, Duke Power Company.

Mr. William G. Pfefferkorn, Winston-Salem, North Carolina, for the intervenors, Mary Apperson Davis and Yadkin River Committee.

Mr. Sherwin E. Turk for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

On March 2, 1982, the Duke Power Company filed identical motions with the Licensing Board and this Board seeking (1) leave to withdraw without prejudice its application for permits to construct the Perkins nuclear facility; and (2) a termination as moot of the still ongoing proceeding on that application. The motion recites that Duke's Board of Directors voted on February 23, 1982 to withdraw the application.

The sought relief is not opposed by the NRC staff. For their part, however, intervenors Mary Apperson Davis and Yadkin River Committee insist that the termination of the proceeding should be *with* prejudice. Additionally, they maintain that, irrespective of the basis of the termination, the applicant should "be required to pay all of the costs in this matter including the reasonable attorney's fees and costs of the Intervenor".¹

As the staff correctly notes, it is for the Licensing Board, before whom portions of this proceeding remain, to pass upon the motion in the first instance. In doing so, it will have to address the claims made by the intervenors in their response. With regard to the question whether the termination of the proceeding should be with prejudice, the Board is to apply the guidance provided by us in *Philadelphia Electric Co.* (Fulton Generating Station, Units 1 and 2), ALAB-657, 14 NRC 967 (1981), and *Puerto Rico Electric Power Authority* (North Coast Nuclear Plant, Unit 1), ALAB-662, 14 NRC 1125 (1981).²

Our own required action at this juncture is confined to three previously rendered partial initial decisions which have not achieved finality: LBP-78-25, 8 NRC 87 (1978); LBP-78-34, 8 NRC 470 (1978); and LBP-80-9, 11 NRC 310 (1980). Each of those decisions is hereby *vacated* on the ground of mootness. See *Boston Edison Co.* (Pilgrim Nuclear Power

¹ Response to Motion to Withdraw, dated March 11, 1982, at p. 1.

² In *North Coast*, we explicitly left open the question whether "conditioning withdrawal of an application upon payment of the opposing parties' expenses might be within the Commission's powers and otherwise appropriate where the expenses incurred were substantial and intervenors developed information which cast doubt upon the merits of the application". 14 NRC 1135, fn. 11. We likewise do not intimate any opinion on the question here, believing that it should be first considered by the Board below.

Station, Unit 1), ALAB-656, 14 NRC 965, 966 (1981), and cases there cited.³

It is so ORDERED.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the Appeal Board

³ Although stripping the partial initial decisions of any precedential effect, this action does not similarly serve to vitiate the testimony and other evidence contained in the record on the issue of the environmental effects associated with the release of radioactive radon gas (radon-222) to the atmosphere as a result of the mining and milling of uranium for reactor fuel. We need stress the point because that record provided a portion of the basis for our decision in *Philadelphia Electric Co.* (Peach Bottom Atomic Power Station, Units 2 and 3), ALAB-640, 13 NRC 487 (1981). It may also be employed in connection with any future decisions in *Peach Bottom* on the radon issue. See, in this connection, ALAB-654, 14 NRC 632, 634-35 (1981).

With regard to the now-vacated partial initial decision which dealt with the radon issue (LBP-78-25, *supra*), suffice it to say that none of the conclusions later reached by us in ALAB-640 depended for its vitality upon any determination of the Licensing Board in that decision. Rather, as is clearly reflected therein, ALAB-640 represents the fruits of our own independent analysis of the content of the *Perkins* record on radon releases taken in conjunction with additional evidence which was adduced in *Peach Bottom*.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**ATOMIC SAFETY AND LICENSING APPEAL BOARD****Administrative Judges:****Alan S. Rosenthal, Chairman**
Dr. John H. Buck
Christine N. Kohl**In the Matter of****Docket Nos. 50-369 OL**
50-370 OL**DUKE POWER COMPANY**
(William B. McGuire Nuclear
Station, Units 1 and 2)**March 30, 1982**

Acting on an intervenor's appeal from two decisions of the Licensing Board (LBP-79-13, 9 NRC 489 (1979); LBP-81-13, 13 NRC 652)), which in combination authorized the issuance of operating licenses for the facility, the Appeal Board affirms those decisions to the extent consistent with its opinion. The Appeal Board makes additional findings to those of the Licensing Board and concludes that the facility's hydrogen mitigation and control system can be operated without endangering the public health and safety during the interim period in which the applicant and the Commission continue to explore the adequacy of the system in place and possible long-term alternatives.

**OPERATING LICENSING PROCEDURES: RESPONSIBILITY OF
LICENSING BOARDS AND
NRC STAFF**

A Licensing Board's role in an operating license proceeding is limited to resolving matters that are raised either by the parties or by the Board *sua sponte*. All other matters that must be considered prior to the issuance of the requested operating license are the responsibility of the Director of Nuclear Reactor Regulation alone. 10 CFR 2.760a; *Consolidated Edison Co.* (Indian Point, Units 1, 2 & 3), ALAB-319, 3 NRC 188, 190 (1976).

RULES OF PRACTICE: CHALLENGE TO COMMISSION REGULATIONS

Neither the standards set in the Commission's regulations pertaining to hydrogen control (10 CFR 50.44) nor the assumptions upon which they are based are subject to challenge in an adjudication unless the Commission specifically authorizes it. 10 CFR 2.758.

LICENSING BOARDS: RESPONSIBILITIES

In the NRC adjudicatory system, no less than in any other, the directives of superior tribunals must be given effect whether or not the subordinate tribunal agrees with them. *Cf. South Carolina Electric and Gas Co.* (Virgil C. Summer Nuclear Station, Unit 1), ALAB-663, 14 NRC 1140, 1150 (1981).

RULES OF PRACTICE: REOPENING OF AN EVIDENTIARY RECORD

It is well-settled that, in order to obtain a reopening of an evidentiary record, a party must establish, *inter alia*, the existence of newly discovered evidence having a material bearing upon the proper result in the proceeding. *Kansas Gas and Electric Co.* (Wolf Creek Generating Station, Unit 1), ALAB-462, 7 NRC 320, 338 (1978), and cases cited.

APPEAL BOARDS: SCOPE OF REVIEW

An Appeal Board, like other appellate tribunals, has no obligation to rule on every discrete point adjudicated below, so long as it is able to render a decision on other grounds that effectively dispose of the appeal. See, *e.g.*, *Asphalt Roofing Manufacturers Association v. ICC*, 567 F.2d 994, 1002 (D.C. Cir. 1977). See also *Consumers Power Co.* (Big Rock Point Nuclear Plant), ALAB-636, 13 NRC 312, 329 fn. 32 (1981); *Houston Lighting and Power Co.* (Allens Creek Nuclear Generating Station, Unit No. 1), ALAB-625, 13 NRC 13, 14 (1981).

LICENSING BOARDS: RESOLUTION OF ISSUES

A licensing board has an ironclad obligation to explain its reasons for finding that a witness' background is inadequate to meet the qualifications of an expert in particular technical areas. See *e.g.*, *Public Service Electric*

and Gas Co. (Hope Creek Generating Station, Units 1 and 2), ALAB-429, 6 NRC 229, 237 (1977); *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-422, 6 NRC 33, 41 (1977), *affirmed*, CLI-78-1, 7 NRC 1 (1978), *affirmed sub nom. New England Coalition on Nuclear Power v. NRC*, 582 F.2d 87 (1st Cir. 1978).

LICENSING BOARDS: RESOLUTION OF ISSUES

Where the Licensing Board has not explained its reasons, the Appeal Board may nonetheless avoid a remand if the path the Licensing Board followed in ruling on a matter is sufficiently discernible on the record. See *Bowman Transportation, Inc. v. Arkansas-Best Freight System, Inc.*, 419 U.S. 281, 286 (1974).

EVIDENCE: EXPERT WITNESSES (QUALIFICATION)

In the absence of a Commission rule expressly stating the standard for judging whether a prospective witness qualifies as an expert, the standard incorporated in Federal Rule of Evidence 702 may be applied; that rule allows a witness qualified by "knowledge, skill, experience, training, or education" to testify "[i]f scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue."

EVIDENCE: HEARSAY (STANDARD FOR ADMISSIBILITY)

Hearsay evidence is generally admissible in NRC proceedings. *Duke Power Co.* (Catawba Nuclear Station, Units 1 and 2), ALAB-355, 4 NRC 397, 411-12 (1976). Thus, the question of whether evidence falls within an exception to the hearsay rule is beside the point in such proceedings. Instead, the admissibility of evidence in NRC adjudication is governed by 10 CFR 2.743(c), which provides that "[o]nly relevant, material and reliable evidence which is not unduly repetitious will be admitted."

EVIDENCE: SPONSORSHIP BY EXPERT

Documents consisting of technical analyses, conclusions and opinions on various aspects of the matter of hydrogen generation and control in nuclear power reactors are the type of evidence that calls for sponsorship by an expert who can be examined on the reliability of the factual assertions and soundness of the scientific opinions found in the documents. *Cf. Wisconsin*

Electric Power Co. (Point Beach Nuclear Plant, Unit 2), ALAB-78, 5 AEC 319, 332-33 (1972) (citing *Dolcin v. FTC*, 219 F.2d 742, 748 (D.C. Cir. 1954), *certiorari denied*, 348 U.S. 981 (1955)).

EVIDENCE: REPORTS OF ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ADMISSIBILITY)

Reports of the Advisory Committee on Reactor Safeguards (ACRS) cannot be admitted into evidence for the truth of the matter stated therein because ACRS members are generally not subject to examination as witnesses. *Arkansas Power and Light Co.* (Arkansas Nuclear One Unit 2), ALAB-94, 6 AEC 25, 32 (1973).

RULES OF PRACTICE: SUBPOENAS

A subpoena request must establish the "general relevance of the testimony . . . sought" to the issues involved. 10 CFR 2.720(a).

RULES OF PRACTICE: APPELLATE REVIEW

An appeal in a licensing proceeding can be decided only on the basis of the Licensing Board record — not on the basis of unsubstantiated references to developments purportedly occurring after the record was closed. If changed circumstances or new evidence exists, a party may seek to reopen the record. *Cf. ICC v. Jersey City*, 322 U.S. 503, 514 (1944). Exceptions to a licensing board's decision, taken without an offer of record support, will be stricken. 10 CFR 2.762(a), (e).

RULES OF PRACTICE: EXCEPTIONS

Claims of error that are without substance or are inadequately briefed will not be considered on appeal. See *Public Service Electric and Gas Co.* (Salem Nuclear Generating Station, Unit 1), ALAB-650, 14 NRC 43, 49-50 (1981).

TECHNICAL ISSUES DISCUSSED:

Hydrogen generation from a LOCA;
hydrogen combustion;
hydrogen control;

emergency hydrogen control systems;
ice condenser containments;
containment pressure limits;
computer codes: MARCH, CLASIX.

APPEARANCES

Mr. J. Michael McGarry, III, Washington, D.C. (with whom Messrs. Malcolm H. Phillips, Jr., Washington, D.C., and William L. Porter and Albert V. Carr, Jr., Charlotte, North Carolina, were on the brief), for Duke Power Company, *applicant*.

Mr. Jesse L. Riley, Charlotte, North Carolina (with whom Mr. Shelley Blum and Ms. Debby Allen, Charlotte, North Carolina, were on the brief) for Carolina Environmental Study Group, *intervenor*.

Mr. Joseph F. Scinto (with whom Mr. Edward J. Ketchen, Jr., was on the brief) for the *Nuclear Regulatory Commission staff*.

DECISION

Before us is the appeal of the intervenor Carolina Environmental Study Group (CESG) from two decisions of the Licensing Board. In combination, these decisions authorized the Director of Nuclear Reactor Regulation (NRR) to issue full-term, full-power operating licenses for the facility.

In the first of these decisions, the Licensing Board determined all matters in controversy in favor of the applicant. LBP-79-13, 9 NRC 489 (1979). It accordingly authorized the issuance of operating licenses for the facility once the NRR Director made all of the other findings requisite to such issuance.¹ For reasons not pertinent to this appeal, however, the Licensing Board stayed the decision's effectiveness pending further order.² Consequently, in a June 21, 1979 unpublished order, the Appeal Panel Chairman deferred the commencement of the time for the filing of exceptions until the issuance of the subsequent Board order.

¹ Under the Commission's regime for operating license proceedings, a Licensing Board's role is limited to resolving matters that are raised either by the parties or by the Board *sua sponte*. All other matters that must be considered prior to the issuance of the requested operating license are the responsibility of the Director alone. 10 CFR 2.760a; *Consolidated Edison Co.* (Indian Point, Units 1, 2 & 3), ALAB-319, 3 NRC 188, 190 (1976).

² Specifically, the Board retained jurisdiction pending receipt of a Supplemental Safety Evaluation Report addressing certain unresolved generic safety issues. 9 NRC at 545, 546-47, 547-48.

On June 9, 1980, while the decision's effectiveness remained suspended, CESG moved to reopen the evidentiary record. Alluding in its motion (at p. 1) to the loss-of-coolant accident (LOCA)³ that had occurred at Unit 2 of the Three Mile Island facility (TMI-2) in March 1979, CESG expressed concern that a "TMI-2 type of accident involving hydrogen release and rapid combustion" at McGuire could adversely affect the public health and safety by causing rupture of the reactor containment building and release of radioactivity to the atmosphere. As later revised on August 15, 1980, the motion was granted and an evidentiary hearing was held on certain specific contentions raised by CESG.

On May 26, 1981, the Board issued a supplemental initial decision. LBP-81-13, 13 NRC 652. Noting that a principal cause of the TMI-2 accident was premature operator interference with the emergency core cooling system (see p. 460, *infra*), the Board found that subsequent changes in plant and equipment, upgraded operator training and operating procedures, and other improvements undertaken by this applicant since the TMI-2 accident rendered the likelihood of this type of occurrence at the McGuire facility "so remote" as to be "not credible." *Id.* at 661-67. The Licensing Board also found that, even if a TMI-2 type accident were to take place at McGuire, there was reasonable assurance that the ECCS would be initiated in time to prevent the generation of hydrogen in excess of the design basis of the facility. *Id.* at 667, 674. On the strength of these and other findings, the Board lifted its earlier stay of the April 1979 decision.⁴ *Id.* at 674-75.

CESG has taken a total of some 28 exceptions to both decisions. Addressing its exceptions in the main to the May 1981 supplemental decision,⁵ CESG's complaint essentially is that the Licensing Board's consideration of the problem of hydrogen generation and control was insufficient. It disputes the conclusion that the McGuire hydrogen mitigation system could successfully prevent a hydrogen explosion in the event of a LOCA. Similarly, CESG disputes whether the containment could withstand such an explosion and thus avoid the release of large amounts of

³ A loss-of-coolant accident involves depletion (by any abnormal occurrence) of the volume of water ordinarily available to cool the reactor core. Some loss can be tolerated as long as enough coolant remains to prevent excessive overheating of the fuel in the reactor. Every power reactor incorporates an Emergency Core Cooling System (ECCS), which is designed to replenish the coolant automatically, should a LOCA occur.

⁴ We denied CESG's motion for a stay of the effectiveness of these decisions. ALAB-647, 14 NRC 27 (1981). For its part, acting under a then-amendment to 10 CFR 2.764 (46 *Fed. Reg.* 28627 (May 28, 1981)), the Commission determined *sua sponte* to allow a full-power license to issue for Unit 1 (judgment was reserved with regard to Unit 2), subject to later confirmation that applicant's igniter hydrogen mitigation system is adequate for the long-term. CLI-81-15, 14 NRC 1 (1981). The Unit 1 license was issued on July 8, 1981.

⁵ CESG's Exceptions to Initial Decision (June 8, 1981), Exceptions 1-17; Appeal Tr. 14-42 ["App. Tr."].

dangerous radioactivity to the surrounding environment. The applicant and NRC staff support the Licensing Board's decision.

We consider below the arguments made by CESG before us. To the extent the Licensing Board's 1979 initial and 1981 supplemental decisions are consistent with this opinion, we affirm. We also make some additional findings on this record.

I. Background

As noted, this appeal centers on the Licensing Board's treatment of the question of hydrogen generation and control associated with a LOCA. We start therefore with a description of the accident at TMI-2 and a discussion of hydrogen evolution from a LOCA, its distribution within a reactor containment, and its combustion.

A. The Accident at TMI-2: Hydrogen Generation⁶

The TMI-2 accident involved a pressurized water reactor designed by Babcock and Wilcox. A reactor of that type is housed within a containment structure and composed of a large steel vessel containing a core of nuclear fuel (in the form of uranium pellets in zircaloy⁷ tubes) submerged in water. Simply stated, the water, under intense pressure, is heated by fission of the fuel during reactor operation and is circulated by pumps and connecting pipes from the reactor vessel through another vessel (the steam generator) and back to the reactor vessel in a continuous flow process.⁸ This circuit is referred to as the primary flow path (or primary side). The primary water flows through a large number of long, narrow tubes in the steam generator. The outside surface of these tubes is in contact with another, wholly independent, water system referred to as the secondary water system (or secondary side). The primary water flowing through the tubes in the steam generator heats the secondary water to produce steam. The steam proceeds from the steam generator to the turbine-generator where its energy is converted to electricity. Upon passing through the turbine-generator, the steam is led to a condenser where it turns to water. The water is then returned by feedwater pumps to the steam generator to begin another cycle of secondary water/steam flow.

⁶ For a fuller description of the TMI-2 accident sequence, see "Investigation into the March 28, 1979 Three Mile Island Accident by Office of Inspection and Enforcement," Appendix I-A, NUREG-0600 (August 1979).

⁷ Zircaloy is an alloy of zirconium, tin, iron and other materials.

⁸ The TMI-2 reactor has two steam generators running in parallel.

The TMI-2 accident started when the feedwater pumps, which deliver water to the secondary side of the steam generators, "tripped," or ceased to operate. 13 NRC at 661. TMI-2 was designed so that if such an event occurred, the flow of feedwater was supposed to continue through a back-up system. Without describing the entire sequence of the accident, it suffices for our purposes to note that neither the feedwater nor the back-up water supply reached the steam generators. This caused the water in the primary system to heat up rapidly with an accompanying increase in pressure in that system. The pilot operated relief valve (PORV) then opened to relieve the excess pressure.⁹ When the pressure decreased, the PORV should have returned to its normally closed position. But at TMI-2 this did not happen, and the stuck-open valve became, in essence, a form of LOCA because it enabled the escape of coolant from the primary system.

Although there are emergency systems designed to remedy such abnormalities, and although these systems functioned properly, their operation was overridden by operator action in several instances. Tr. 4065. See also *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 1), CLI-80-16, 11 NRC 674, 675, 676 (1980) ["*TMI-1 Restart*"]. The consequence was that the water level in the primary side (the water in contact with the fuel rods) fell below the top of the core. Once the core became uncovered, the residual heat from fission product decay¹⁰ continued to raise the temperature of the fuel rods and converted some of the water in the reactor vessel to steam. The ensuing contact between the water/steam mixture and the excessively heated zircaloy cladding of the fuel rods resulted in the oxidation of the zircaloy, which in turn released a substantial quantity of hydrogen.¹¹ The hydrogen escaped the reactor vessel to the space within the containment structure through valves that were open at various times during the accident. Some of the hydrogen apparently accumulated there and combined with sufficient oxygen in the air to produce rapid burning, causing pressure rises in the containment.¹²

⁹ This valve is located at the top of a pressurizer vessel which is directly connected to the primary system piping. The valve is specifically designed to open automatically to relieve pressure on the primary side whenever the pressure reaches a certain preset limit.

¹⁰ Full power operation had automatically terminated earlier in the accident.

¹¹ For a more detailed discussion of the hydrogen evolution phenomenon, see "The Behavior of Hydrogen During Accidents In Light Water Reactors," NUREG/CR-1561 (August 1980).

¹² 10 CFR 50.44 sets the Commission standards for combustible gas control systems in light water reactors. 43 *Fed. Reg.* 50162 (October 27, 1978). Under these standards, gas control systems must accommodate the amount of hydrogen that would result from the reaction between steam and five percent of the metal cladding around the fuel rods. 10 CFR 50.44(d)(2). There is evidence that the TMI-2 accident, however, resulted in a much greater metal-steam reaction. The Commission is therefore reevaluating the 10 CFR 50.44 standards

(CONTINUED)

B. Hydrogen Distribution and Control

The TMI-2 containment was designed to withstand pressures significantly higher than that produced by the hydrogen burn.¹³ In the case of some reactors, however, the containment *design* pressure is less than the peak pressure that was experienced at TMI-2. The McGuire reactors (which, unlike the TMI-2 reactor, utilize an ice condenser containment) fall into that category.¹⁴

An ice condenser is designed to limit the peak pressure in the containment structure during the "normal" design basis LOCA (*i.e.*, one in which the safety systems function properly to keep the core covered with water). In such a LOCA, it is assumed that a large amount of high-temperature steam generated by the rapid boiling of the hot primary water will escape into the containment through a large pipe break. See 10 CFR Part 50, Appendix A. The addition of this steam will increase the pressure within the containment. The ice condenser located within the containment will prevent, however, a significant increase in that pressure by converting much of the steam back to water. This occurs by the circulation of the steam over large volumes of ice located in that condenser. By reason of this process, an ice condenser plant is expected to experience lower peak pressures in the event of a design basis LOCA than other facilities without ice condensers. Consequently, the walls of a containment with an ice condenser are much thinner than those of other containments.

As we have seen, if the safety systems do not function properly, or are interfered with to the extent that the core becomes uncovered (as at TMI-2), large quantities of hydrogen may be generated. In such an event, the way in which the hydrogen is distributed throughout the total volume of the containment becomes important.

and their underlying assumptions and has embarked on a long-term rulemaking to explore this area. 45 *Fed. Reg.* 65466 (October 2, 1980). For the interim, the Commission recently adopted some partial amendments to 10 CFR 50.44, requiring inerting, hydrogen recombining, and venting in certain types of reactors. 46 *Fed. Reg.* 58484 (December 2, 1981). It has also proposed requiring reactors with ice condenser containments (see pp.461-62, *infra*) to install hydrogen control systems that can accommodate hydrogen from a 75 percent metal-steam reaction. 46 *Fed. Reg.* 62281 (December 23, 1981).

¹³ The TMI-2 containment design pressure was 60 pounds per square inch gauge (psig), whereas the peak pressure reached during the hydrogen burn from the accident was about 28 psig. Tr. 3369, 3372-73.

At the hearing below, pressure was denoted in terms of either psig or psia (pounds per square inch absolute). A pressure denoted in psia can be converted to psig by subtracting the atmospheric pressure (nominally, 14.7 psi). For the sake of uniformity, we express all pressures in this decision in psig.

¹⁴ The containment design pressure for McGuire is 15 psig. Final Safety Analysis Report, at p. 3, 8-8. But see pp.469-70, *infra*, where we discuss evidence that the McGuire containment can, in fact, withstand substantially greater pressures.

In the ice condenser design such as that for the McGuire plant, the containment consists of three major segments — the lower one, which contains the reactor vessel, the primary and secondary coolant piping, associated pumps, and the steam generators; the middle one, which contains the ice condenser system; and the upper one, which is relatively free of equipment. Staff Exh. B, "Safety Evaluation Report," NUREG-0422 (March 1978), p. 6-4. Because of its source (the steam zircaloy reaction), the hydrogen produced in the design basis LOCA will be emitted from the hypothesized pipe break into the lower containment segment. At this point, the hydrogen will become mixed with steam and air and then will be distributed initially by the turbulence that naturally takes place during ejection from the pipe. This hydrogen mixture will move upward through the ice condenser by natural convection and forced flow induced by large fans located at various points in the containment space. As the hydrogen mixture passes through the ice condenser, the steam condenses and the resultant condensate falls to the bottom. The hydrogen and air flow out of the ice condenser at the top and into the upper containment segment. See Lewis Panel, fol. Tr. 3144, at pp. 9-10.

Although the flow path of the hydrogen-steam-air mix is as we have just described, the hydrogen concentration at the various points along this flow path may not always be uniform. The concern is that large volumes of hydrogen might accumulate at some location. If this hydrogen were to mix with sufficient air and ignite, it might be susceptible to rapid combustion (detonation), producing pressures such as were observed at TMI-2. See fn. 13, *supra*.¹⁵

II. Hydrogen Generation and Control at McGuire

A. Scope of Contentions

1. In granting CESG's August 15, 1980 revised motion to reopen, the Licensing Board admitted four contentions for litigation.¹⁶ The Board ultimately determined, however, that only the following first two of those contentions required its consideration:

¹⁵ The speed of combustion will depend largely on the concentrations of the hydrogen and oxygen ignited in the volume. See pp. 467-68 & fn. 27, *infra*. It can range from that experienced in the operation of a household gas stove to an explosion.

¹⁶ After the record had been reopened at its behest, CESG endeavored to inject two more contentions into the proceeding. Contention 5 stated that an environmental impact statement on the consequences of a Class 9 accident at McGuire was required, and contention 6 urged that the emergency response plan for McGuire be revised to include the city of Charlotte, North Carolina. In an unpublished memorandum and order issued February 13, 1981, the Licensing Board denied the admission of both.

Contention 1: The licensee has not demonstrated that, in the event of a loss-of-coolant accident at McGuire:

1. substantial quantities of hydrogen (in excess of the design basis of 10 CFR § 50.44) will not be generated; and
2. that, in the event of such generation, the hydrogen will not combust; and
3. that, in the event of such generation and combustion, the containment has the ability to withstand pressure below or above the containment design pressure, thereby preventing releases of off-site radiation in excess of [10 CFR] Part 100 guideline values.

Contention 2: Neither licensee nor NRC staff has demonstrated that a McGuire ice containment will not breach as the result of the rapid combustion of quantities of hydrogen which a dry containment would withstand.

In the Board's view, contentions 1 and 2 called upon it to decide at the threshold whether the occurrence of a "TMI-2 type" accident at McGuire was "credible". The Board rested this conclusion upon a Commission ruling in the proceeding concerned with the restart of Unit 1 of the TMI facility. 13 NRC at 657-60. See *TMI-1 Restart, supra*, 11 NRC at 675-76.

Contentions 3 and 4 explicitly assumed a containment rupture as a result of a hydrogen explosion and its consequences.¹⁷ The Licensing Board initially deferred receipt of evidence on them to abide the event of its findings on contentions 1 and 2, which, as we have seen, dealt with the containment rupture question. Tr. 3481-83. The Board ultimately rejected those contentions (1 and 2) on the merits after the hearing and found that generation of excessive amounts of hydrogen, breach of containment, and offsite doses of radiation in excess of 10 CFR Part 100 values¹⁸ were not credible events. Accordingly, it ruled that "the premise for CESG Contentions 3 and 4 has not been established and there is no need to make specific findings with respect to those contentions." 13 NRC at 674.

2. CESG argues on appeal that the Licensing Board erred in requiring it to establish a credible accident scenario resulting in the generation of

¹⁷ These contentions read as follows:

Contention 3: Neither licensee nor NRC staff has demonstrated that the emergency planning radius of 10 miles is sufficient for protecting the public from the radioactive releases of a low pressure, ice condenser containment ruptured by a hydrogen explosion.

Contention 4: Licensee and NRC planning do not provide for crisis relocation which would be required as a result of containment breach and radioactive particle release.

¹⁸ 10 CFR Part 100 prescribes reactor siting criteria in terms of offsite doses of radiation assumed to result from a containment leak.

amounts of hydrogen exceeding those that the McGuire facility is designed to handle. CESG's Brief — Appeal of Initial and Supplemental Decisions (July 8, 1981), p. 24["Br."]; App. Tr. 8. In our view, however, the Board correctly relied on the Commission's guidance in the *TMI-1 Restart* proceeding and thus concluded that contentions 1 and 2 should be considered solely in the context of a credible accident.

Commission regulations set standards for hydrogen control that each facility must meet before being licensed. These standards are based on certain assumptions concerning the rate and amount of hydrogen production from a metal-water (steam) reaction during a LOCA. See 10 CFR 50.44 and fn. 12, *supra*. Neither the standards nor the assumptions upon which they are based are subject to challenge in an adjudication unless the Commission specifically authorizes it. 10 CFR 2.758. CESG's contentions 1 and 2 implicitly sought such a waiver.¹⁹ Because a contention in the *TMI-1 Restart* proceeding raised the same issue, the Licensing Board relied on the guidance of the Commission itself in that matter. 13 NRC at 657-60. The Commission had refused to waive the application of the 10 CFR 50.44 standards to TMI-1 but found that,

quite apart from 10 CFR 50.44, hydrogen gas control could properly be litigated in this proceeding under 10 CFR Part 100. Under Part 100, hydrogen control measures beyond those required by 10 CFR 50.44 would be required *if it is determined that there is a credible loss-of-coolant accident scenario* entailing hydrogen generation, hydrogen combustion, containment breach or leaking, and offsite radiation doses in excess of Part 100 guideline values.

TMI-1 Restart, supra, 11 NRC at 675 (emphasis added).²⁰

The Licensing Board quite properly relied on *TMI-1 Restart*. Although the latter ruling was in response to particular questions concerning TMI-1, the Commission was patently aware that matters relating to hydrogen control raised issues "common to all light water power reactors." *Ibid*. See generally "Further Commission Guidance for Power Reactor Operating Licenses; Statement of Policy," 45 *Fed. Reg.* 41738, 41740 (June 20, 1980), *as modified*, 45 *Fed. Reg.* 85236, 85238 (December 24, 1980). The Commission thus having expressed its intent not to waive the design basis assumptions of 10 CFR 50.44 but to consider hydrogen control measures only in the context of a "credible LOCA," it was incumbent upon the Licensing Board — as it is now upon this Appeal Board — to act in

¹⁹ CESG does not dispute that the McGuire facility satisfies the hydrogen control requirements set forth in 10 CFR 50.44.

²⁰ The Commission also noted that it planned "a broad rulemaking proceeding that will address the general question of possible safety features to deal with degraded core conditions," including "measures to deal with hydrogen generation following a loss-of-coolant accident." 11 NRC at 675.

accordance with that intent. Despite CESC's insistence that "fairness and reasonableness" require otherwise (App. Tr. 8), in this adjudicatory system, no less than in any other, the directives of superior tribunals must be given effect whether or not the subordinate tribunal agrees with them. *Cf. South Carolina Electric and Gas Co. (Virgil C. Summer Nuclear Station, Unit 1)*, ALAB-663, 14 NRC 1140, 1150 (1981).²¹

Similarly, we reject CESC's argument that the Licensing Board erred in using a "TMI-2 type" accident as the point of reference for the consideration of contentions 1 and 2.²² While the contentions themselves may not have been so cast, the motion to reopen that undergirded them rested squarely upon the TMI-2 accident.²³ Indeed, this was necessarily so: it is well-settled that, in order to obtain a reopening of an evidentiary record, a party must establish, *inter alia*, the existence of newly discovered evidence having a material bearing upon the proper result in the proceeding. *Kansas Gas and Electric Co. (Wolf Creek Generating Station, Unit No. 1)*, ALAB-462, 7 NRC 320, 338 (1978), and cases cited. In this instance, the TMI-2 accident was the only development subsequent to the closing of the record in 1978 on all contested issues which might have such a bearing upon the hydrogen control matter. CESC therefore had to provide the foundation for any reopening of the record to consider that matter, and its motion necessarily shaped the scope of the reopened proceeding.

²¹ CESC, of course, will have the opportunity to seek Commission review of our decision and can thus attempt to persuade the Commission itself of the merits of its position. See 10 CFR 2.786.

²² Although the Licensing Board did not indicate explicitly what it thought a "TMI-2 type" accident is, it apparently did not mean to confine that term to accident sequences identical in all significant respects to those of the TMI-2 accident. To illustrate, the Board admitted evidence proffered by applicant in connection with contentions 1 and 2 that related to a LOCA *not* involving operator interference with the functioning of the ECCS. This postulated accident sequence, characterized as S2D, assumed a small LOCA (in the one-half to two inch diameter range) with the break occurring anywhere in the primary coolant system and a simultaneous failure of ECCS operation. Applicant Exh. 5A, at p. 2-2; Tr. 3374. Compare the sequence of events at TMI-2, as described by the Licensing Board. 13 NRC at 661. See also pp. 459-61, *supra*.

²³ The initial motion (filed on June 9, 1980) was introduced with this statement:

The events at Three Mile Island 2, commencing March 28, 1979, have demonstrated that, at the time of licensing TMI-2 to operate there were still lessons to be learned. [Footnote omitted.] The McGuire construction permit and operating license proceedings were held before this date. There is, further, the reasonable likelihood that there are additional lessons to be learned in the case of a TMI-2 type of accident involving hydrogen release and rapid combustion in a pressure suppression station such as McGuire.

Both it and the revised motion filed on August 15, 1980 were replete with references to the TMI-2 accident.

In short, under established Commission practice and as the result of the successful motion to reopen, the Licensing Board was compelled to resolve simply whether the TMI-2 accident itself (*i.e.*, the intervening event leading to the reopening) required an alteration in the Board's previous, favorable findings on the safety of McGuire operation. That being so, there was no occasion for the Board to entertain CESG's postulation of a wide range of other types of LOCAs (such as those initiated by the complete loss of offsite and onsite power), having no reasonable relationship to what transpired at TMI-2.²⁴

B. The Hydrogen Mitigation System

Because of its conclusion that a TMI-2 accident was not credible, the Licensing Board found no occasion to determine whether the occurrence of such an accident might cause a containment breach. Nonetheless, the Board received considerable evidence on the latter question, which it summarized in the supplemental initial decision. 13 NRC at 667-73. As it has turned out, this was a fortunate development.

In authorizing the issuance of an operating license for Unit 1 in the wake of the supplemental initial decision (see fn. 4, *supra*), the Commission noted that the applicant had agreed to install and use an igniter hydrogen mitigation system. It stated, without elaboration, its belief that such "installation and use of an appropriate hydrogen mitigation system is required for adequate protection of the public health and safety." CLI-81-15, 14 NRC 1, 2 (1981). Given that expressed opinion, the matter of the efficacy of the applicant's proposed mitigation system assumes present significance whether or not a TMI-2 type accident is credible. We therefore need not pass on the Licensing Board's judgment that a TMI-2 type accident at McGuire is "not credible." See 13 NRC at 667. Instead, we have undertaken an independent examination of the evidence on hydrogen generation and control to ascertain whether there is reasonable assurance that the hydrogen mitigation system at McGuire will prevent the buildup of unacceptable containment pressures, even if a TMI-2 type accident were to occur.²⁵

²⁴ CESG, of course, had every opportunity to raise such issues (through the filing of acceptable and timely contentions) before the commencement of the initial health and safety hearings that took place several years ago.

²⁵ The concurring opinion strongly implies that our determination not to pass on the Licensing Board's "TMI-2 credibility" ruling was inappropriately influenced by the Commission's immediate effectiveness decision. Dr. Buck and Ms. Kohl disagree.

Initially, we reject any suggestion that this decision is "prejudiced" or grounded on anything other than the evidence of record adduced before the Licensing Board and arguments made on appeal before this Board. Further, the Commission's immediate effectiveness order does not provide "*of itself*, [the] justification for not reaching" the TMI-2 credibility issue. See p.

(CONTINUED)

1. The hydrogen mitigation system consists of igniter assemblies (essentially electric power "glow plugs" similar to those used to assist initial ignition in diesel engines) strategically placed in various parts of the containment,²⁶ air return fans, hydrogen skimmer fans, and containment sprays. Its purpose is to prevent the accumulation of such amounts of hydrogen as might, when combined with the oxygen found in the air in the containment, produce an explosion which would, in turn, bring about high pressure peaks.²⁷ It accomplishes this objective by causing the hydrogen to burn at low concentrations before it reaches explosive levels. The air return fans, skimmer fans, and containment sprays serve to insure a sufficient

484, *infra* (emphasis added). The order, of course, played some role in our determination. To intimate otherwise would be intellectually dishonest. On the other hand, to have ignored it entirely — an option eschewed even by the concurrence — would have been both ill-advised and myopic. Thus, we simply took the Commission's order into account with other factors present here — *i.e.*, (1) the fortuitous circumstance of a well-developed record on hydrogen generation and control, and (2) our ability to make an ultimate finding on the adequacy of the hydrogen mitigation system at McGuire without deciding the credibility issue (see p. 472, *infra*). As a consequence, we found no occasion to grapple with what the concurrence acknowledges is not an easy task — defining "credible" and then determining if a TMI-2 type accident at McGuire could be so characterized. See p. 485 fn. 8, *infra*. (Indeed, even in the absence of the Commission's order, we could, and perhaps would, have pursued the same course.)

Moreover, our chosen path is one commonly open to and followed by this and other intermediate appellate tribunals. See, *e.g.*, *Asphalt Roofing Manufacturers Association v. ICC*, 567 F.2d 994, 1002 (D.C. Cir. 1977), where the court of appeals refused to decide whether the ICC's determination of revenue need in a "general revenue" rail rate proceeding was judicially reviewable but chose instead to review the underlying agency record, finding a rational basis for the ICC's order. See also *Consumers Power Co.* (Big Rock Point Nuclear Plant), ALAB-636, 13 NRC 312, 329 fn. 32 (1981); *Houston Light and Power Co.* (Allens Creek Nuclear Generating Station, Unit No. 1), ALAB-625, 13 NRC 13, 15 (1981). We have no obligation to rule on every discrete point adjudicated below, so long as we are able to render a decision on other grounds that effectively dispose of the appeal.

Finally, two aspects of the concurrence are noteworthy. First, despite the exhortation of an "obligation" to pass on the Licensing Board's ruling and on what is characterized (wrongly, in our view) as a "principal" question on appeal (pp. 482, 481, *infra*), the concurring opinion curiously neither offers a definition of "credible" nor expresses a view on whether a TMI-2 type accident is "credible" at McGuire. Second, if carried to its logical conclusion, the concurrence would find no need for or value in exploring the adequacy of the hydrogen mitigation system, unless it were first determined that a TMI-2 type accident is in fact "credible." Yet, as noted above, our concurring colleague does not offer his views on the credibility of a TMI-2 event at McGuire or make any effort to disassociate himself from the discussion of the mitigation system's adequacy. In fact, he "fully subscribe[s]" to it. See p. 482, *infra*.

²⁶ Forty-six of the igniters are located in the lower compartment, eight in the upper plenum of the ice condenser and eight in the upper containment region. Rasin, fol. Tr. 3488, at p. 1.

²⁷ With sufficient oxygen present the lower limit of flammability is about four percent hydrogen. Between six and ten percent concentration, hydrogen will burn in a propagating manner. The lower limit for detonation is about 18 percent hydrogen. Lewis Panel, fol. Tr. 3144, at pp. 1-12.

mixture of oxygen and hydrogen to enable the latter to burn upon contact with the igniters. Canup, fol. Tr. 3488, at pp. 2-3.²⁸

To verify its effectiveness, the applicant performed an analysis of this system.²⁹ For purposes of the analysis, it assumed a small break at some point in the primary cooling system (in the one-half to two-inch diameter range), coupled with a failure of the ECCS at the inception — an accident sequence identified at S2D. Applicant Exh. 5A, at p. 2-2; Tr. 3374. See also fn. 22, *supra*. It also assumed that the accident progresses long enough to generate a quantity of hydrogen from approximately a 75 percent zirconium/steam reaction. Tr. 3203-04.³⁰ The peak containment pressure from that accident was computed to be less than 16 psig. Lewis Panel, fol. Tr. 3144, at p. 2-3.³¹

The staff also evaluated various accident sequences in which hydrogen is generated and burned — not only the S2D sequence but, as well, pipe breaks up to five inches in diameter accompanied by an ECCS failure either at the outset of the accident or at some subsequent point. Staff Exh. K, fol. Tr. 4353, at pp. 19, 26-27.³² In addition, it conducted analyses of variations of the S2D sequence, including an accident which assumed the meltdown of all the ice in the condenser before all the hydrogen is burned. In the “majority” of the sequences considered, the result was a three psi increase in pressure in the containment. Even in the instance of the S2D sequence with ice meltdown, the calculations showed that the peak pressure would rise only to about 35 psig. Staff Exh. K, fol. Tr. 4353, at pp. 26-27. See fns. 13 & 14, *supra*.

²⁸ Although designed primarily to remove excess heat from the containment atmosphere (thereby reducing the pressure), the containment spray augments mixing by promoting turbulence. Tr. 3329; Lewis Panel, fol. Tr. 3144, at p. 4.

²⁹ The applicant used hydrogen releases derived from the MARCH code and calculated the various containment pressures with the CLASIX code. Applicant Exh. 5A, at pp. 2-2 - 2-9; Applicant Exh. 5B, at pp. 2-10 - 2-14; Staff Exh. K, fol. Tr. 4353, at pp. 20-27. A brief description of these codes is contained in Appendix A to this decision.

³⁰ A 75 percent zirconium/steam reaction was used so as to simulate a TMI-2 type accident in which there is an uncovering of the core but not a substantial core melt. At about a 75 percent reaction, other factors would come into play that would limit hydrogen generation. Tr. 3203-04. Moreover, the Commission has stated that “[e]vents with metal-water reactions in excess of 75% are judged to be associated with core-melt accidents which could pose a threat to containment greater than the combustion of hydrogen.” 46 *Fed. Reg.* at 62282, *supra*.

³¹ The applicant’s base case hypothesized operability of the mitigation systems (e.g., the igniters, containment air return fans, and containment sprays). The applicant also performed sensitivity studies in which the operability of these systems and other parameters were varied. Only a few cases with extreme variations of the parameters (inoperative air return fans or very high hydrogen concentrations) led to peak pressures in excess of the containment functional capability. But, on this score, the applicant’s witnesses testified that, even if nothing but the igniters were operational, if one accounted for heat losses to the steel walls of containment, the containment would not be overpressurized. Tr. 3191-97, 3357-61.

³² The staff based its evaluation model on the Sequoyah containment, which is similar to the McGuire containment in that both are ice condenser designs of about the same size. Staff Exh. K, fol. Tr. 4353, at p. 26.

On cross-examination of staff witness Meyer, CESG elicited that a staff analysis (by the Brookhaven National Laboratory) of an assumed S2D sequence in which the ECCS started at about one and one-half hours after the LOCA commenced had produced a calculated pressure peak in the upper containment of about 47 psig. Tr. 4425-27. The witness explained, however, that, because of certain conservative assumptions factored into the analysis, that pressure level was unlikely to be reached in an actual accident situation. For one thing, the MARCH code for this sequence assumes that, in addition to delayed operation of the ECCS, the sprays in the upper containment would not function; with the sprays operating, the peak pressure would be lower.³³ Further, the analysis presumed a burning of the hydrogen in the upper compartment at 10 percent concentration until the hydrogen was entirely consumed. According to the witness, "a more probable burn * * * is from eight to four percent or eight to zero percent;" *i.e.*, there would not be as great a temperature rise (and attendant pressure increase in the containment) stemming from the hydrogen ignition. Tr. 4430.

Both the applicant and the staff also conducted studies of the containment structural capability. The applicant had performed two separate analyses to determine the maximum static pressure load the McGuire containment could withstand without losing its leakage resistance. Although the design basis pressure is 15 psig (see fn. 14, *supra*), one study computed that McGuire can in fact withstand a pressure of 67.5 psig (Priory, fol. Tr. 3654, at pp. 1-2), and the other, 68 psig (Orr, fol. Tr. 3654, at pp. 1-2). The staff — through its consultant, the Ames Laboratory of Iowa State University — calculated the mean value to be 84 psig with a standard deviation of 12 psig. Because "the containment shell is approaching tension yield across the complete cross section accompanied by large deformations at the 84 psig value," however, the staff considers the mean pressure minus *three* standard deviations (*i.e.*, 48 psig) to be "the appropriate lower bound pressure capacity * * * [for] leak tightness * * * [to] be assured." Staff Exh. K, fol. Tr. 4353, at p. 28. See also *id.* at 30,

³³ This is because the sprays would absorb some of the heat from the hydrogen burn, lowering the temperature within the containment and the corresponding pressure. Canup, fol. Tr. 3488, at p. 3. Witness Meyer noted one factor, however, that "would have some cancelling effect to that particular conservatism in MARCH" — that is, MARCH tends to equalize rapidly the pressures between compartments. Tr. 4430.

31; Tr. 4893-94, 4903-04, 4940-42.³⁴ The probability of containment failure at 48 psig was computed to be 4×10^{-5} occurrence. Tr. 4894.

In short, both the applicant's analyses of the S2D sequence and the staff's study of that sequence and reasonable variations showed peak pulses below either the 67.5 - 68 psig containment capacity arrived at by the applicant, or the particularly conservative 48 psig calculated by the staff's consultant. Further, the probability of containment rupture at even the latter value is very remote.³⁵

2. In its brief, CESG questions, however, the validity of the results of the applicant and staff analyses respecting the efficacy of the hydrogen mitigation system. Br., pp. 11-12. It does so on the basis of the testimony of Dr. Marshall Berman of the Sandia National Laboratories, who appeared as a staff witness.

As earlier noted (fn. 26, *supra*), eight of the igniters are located in the upper plenum of the ice condenser. Dr. Berman expressed the concern that, *inter alia*, pockets of hydrogen in detonable quantities might accumulate in that region and, if ignited, produce an explosion of sufficient force ultimately to damage the containment wall. For this reason, he thought it desirable not to place igniters in the ice condenser. Tr. 4082-84, 4103.

Dr. Berman's concern had a two-pronged foundation. The first was the "anomalous" results of two experiments conducted at the Lawrence Livermore National Laboratory that suggested the "inerting" (failure to burn) in the lower compartment of hydrogen found in a mixture with a steam concentration as low as 23 percent. Tr. 4091.³⁶ Dr. Berman described this phenomenon as "fogging." *Ibid.* See also CESG Exh. 40A, at pp. 72-107. The second prong of the concern rested upon experiments performed by Dr. John Lee of McGill University in Montreal. The experiments suggested to Dr. Berman that obstacles in the path of the upward flow of the hydrogen/steam mixture through the ice condenser might cause turbulence, which in turn might enhance the possibility of hydrogen accumulation and detonation. Tr. 4083-84, 4095-97.

³⁴ The staff consultants used the actual strength of the steel plate in the McGuire containment rather than the value specified in the ASME code. If the code value for material strength had been used in these calculations, the containment pressure capacity would be 39 psig. Staff Exh. K, fol. Tr. 4353, at p. 31.

³⁵ Even the S2D variation that predicts a peak pressure of 47 psig is within these highly conservative calculations for containment strength. See Tr. 4427-30. As we have seen, in order for the containment pressure to reach that level in the LOCA sequence analyzed, a number of improbable events would have to occur: an initial ECCS failure; a more or less *contemporaneous failure of the containment sprays*; and a *hydrogen burn from 10 percent to zero*.

³⁶ Dr. Berman's use of "anomalous" likely had reference to the fact that numerous other experiments performed at Livermore had produced quite different results: that hydrogen will ignite even where the steam concentration mixture is at 30-40 percent. Staff Exh. K, fol. Tr. 4353, at pp. 15-16.

For its part, the applicant adduced the testimony of, *inter alia*, Dr. Bernard Lewis and Bela Karlovitz, each of whom has extensive experience (in the case of Dr. Lewis, more than 50 years) in the area of hydrogen combustion.³⁷ Both witnesses expressed the firm opinion that the igniters should be left in the upper plenum of the ice condenser. Indeed, Dr. Lewis stated that, in his view, this was "imperative." Tr. 3152-54.

According to Dr. Lewis (with the concurrence of Mr. Karlovitz), there is a gradual reduction in water vapor content as the hydrogen/water (steam)/air mixture moves through the ice condenser, "with the final concentration" of water (steam) in the upper being "zero". What is in the plenum, therefore, is a mixture of hydrogen and air. When the hydrogen reaches an 8.5 percent concentration, it will ignite. Thus, Dr. Lewis concluded, "you can never build up a high concentration of hydrogen" in the upper plenum. Tr. 3154. See also Tr. 5050-54, 5081, 5084-85, 5089-90.³⁸

Both Dr. Lewis and Mr. Karlovitz also testified that the conditions in Dr. Lee's experiments did not simulate the geometry of the McGuire containment. Although there are obstacles in the upper plenum of the ice condenser, the percentage of blockage that caused the turbulence and detonation in the Lee experiments was materially higher. Tr. 5050, 5057-58, 5060-61, 5081-83.³⁹ Dr. Lewis further emphasized his judgment

³⁷ The professional qualifications of these witnesses appear in connection with their prepared testimony, fol. Tr. 3144. At oral argument, CESH's representative characterized Dr. Lewis as the "dean" of "the whole area [of] hydrogen combustion." App. Tr. 39. Dr. Berman similarly acknowledged that Dr. Lewis is a "renowned combustion expert." Tr. 4036-37.

³⁸ CESH contends that the MARCH and CLASIX codes used in the applicant's analyses (see fn. 29, *supra*, and Appendix A) are inadequate, primarily because they assume incorrectly (in CESH's view) uniform mixing and distribution of hydrogen and air throughout the containment. Br., pp. 37-38. We do not believe that CESH's concerns are well-founded.

The MARCH code may well have its limitations. See CESH Exh. 40A, at pp. 36, 54. While the CLASIX code has been described as "under development," it has been found to predict adequately the containment transient (*id.* at 36; Staff Exh. K, fol. Tr. 4353, at pp. 25, 26). Expert witnesses testified *without regard to either code*, however, that turbulence resulting from a break in the primary coolant system would cause "rapid and complete" mixing of the hydrogen, steam, and air in the lower containment. Air return fans would also accelerate mixing in this region. Turbulence and the flow through exit paths in the so-called "dead-ended" chambers assure "that the hydrogen concentrations in these volumes do not vary significantly from that of the remainder of the lower containment." In the upper regions, the ice condenser removes steam from the mixture as it flows upward, where it is again mixed by turbulence from air return fans and water sprays. Lewis Panel, fol. Tr. 3144, at pp. 9-10. Thus, applicant's analyses based on the assertedly inadequate codes reasonably reflect the actual conditions throughout the containment, insofar as the uniform mixing and distribution of hydrogen and air are concerned.

³⁹ Dr. Lewis and Mr. Karlovitz have physically observed the McGuire ice condenser containment (Tr. 5085-86); Dr. Berman is generally familiar with, but has not visited, McGuire (Tr. 4215); and the extent of Dr. Lee's knowledge of the plant is unclear (Tr. 4212-13).

that, in any event, "it is not possible to get a flammable mixture under the conditions laid down by Dr. Berman," and that consequently there was "no relevance in discussing blockage in the ice condenser." Tr. 5061. See also Tr. 5059.

CESG has thus provided no substantial cause for discrediting the expert testimony and conclusions of Dr. Lewis and Mr. Karlovitz. On the other hand, the Commission has explicitly acknowledged the concerns about steam inerting in the lower compartment voiced by Dr. Berman in this proceeding and has just recently instituted a rulemaking to explore the matter of hydrogen control in ice condenser containments. 46 *Fed. Reg.* 62281, 62282 (December 23, 1981). In that connection, the Commission has concluded that "interim approval of deliberate ignition systems for ice condenser plants" is warranted, but has also noted its requirement in individual licensing proceedings "that studies of alternative hydrogen management systems be performed prior to the long-term approval of any particular method." *Id.* at 62282. See fn. 12, *supra*. Thus, at the time the Commission authorized the issuance of applicant's full power, full term operating license, it imposed license conditions requiring Duke Power, in the interim, to continue its hydrogen research program and, for the long term, to install an "adequate" hydrogen control system. 14 NRC at 2.⁴⁰

In these circumstances, we find reasonable assurance that the hydrogen mitigation and control system at McGuire can be operated without endangering the health and safety of the public, during the period in which applicant and the Commission continue to explore the adequacy of the system in place and possible long-term alternatives.

C. Other Contentions

CESG argues that the Licensing Board erred in not receiving evidence and making findings on its contentions 3 and 4, which challenged the adequacy of emergency planning for McGuire in the event of a hydrogen explosion and containment breach. See fn. 17, *supra*. As noted *supra*, p. 463, the Board found no need to rule on this matter because "the premise for CESG Contentions 3 and 4 [*i.e.*, a hydrogen explosion and containment breach] has not been established." 13 NRC at 674. CESG asserts, however, that without consideration of the consequences of such an

⁴⁰ Originally, the Commission was to confirm the adequacy of the McGuire hydrogen control system by January 31, 1982. Licensing Amendment No. 13, however, pushed that date back and now requires confirmation of the system's adequacy prior to startup following the first refueling outage. See Board Notification No. 82-13, "License Amendment on Adequacy of Hydrogen Control Systems" (February 11, 1982).

event, the Board could not make a fair or accurate determination of the risk posed by the McGuire facility. Br., pp. 10-11, 29-30.

We agree that a containment rupture caused by a hydrogen explosion — if established — might well provide a foundation for the consideration of emergency planning issues. But as the record and our preceding discussion at pp. 467-472 shows, the hydrogen mitigation system at McGuire provides adequate assurance that such an explosion and breach are not likely to occur at the facility. CESG has thus failed to provide the necessary predicate required by its own contentions 3 and 4. The Board therefore had no reasonable cause to pursue those issues, and, in the circumstances, we cannot find that it erred in deferring and ultimately foreclosing consideration of CESG contentions 3 and 4.

Relying on arguments it made before the Licensing Board (Br., p. 30), CESG also appeals the denial of its contentions 5 and 6. These contentions as well concerned accident consequences and plant response. See fn. 16, *supra*. For the reasons set forth in the Board's thorough and well-reasoned unpublished memorandum and order of February 13, 1981, we expressly affirm the refusal to admit contentions 5 and 6.

D. The Licensing Board's Evidentiary Rulings

Although the record does not substantiate CESG's insistence that the McGuire hydrogen mitigation system is inadequate to prevent a containment rupture in the event of a TMI-2 type accident, there remain its claims that certain evidence it attempted to introduce was improperly excluded.

1. a. CESG offered into evidence the written testimony of its representative, Jesse L. Riley, and a number of documents on which that testimony was based.⁴¹ Its avowed purpose was to establish that (i) hydrogen could be generated in substantially greater amounts during a LOCA than considered by the applicant, and (ii) it could accumulate and mix with air in the containment structure in such a way as to detonate, causing rupture of the containment and radiation release.⁴²

After an extensive *voir dire*, the Licensing Board found that Mr. Riley did not qualify as an expert on either "strength of the containment structure" or "hydrogen burning or detonation." Tr. 3967. See also 13 NRC at 664. Accordingly, the Board refused to admit the proffered

⁴¹ These documents were identified as CESG's Exhibits 42 through 60. Tr. 3781-3824.

⁴² Testimony of Jesse L. Riley Regarding Hydrogen Generation, Combustion, and Containment Response, fol. Tr. 3780, at p. 1.

written testimony and also struck from the record earlier oral testimony given by Mr. Riley. Tr. 3967, 3969.⁴³

By Mr. Riley's own admission, he is not a structural engineer. App. Tr. 39. See also Br., p. 8. CESG stresses, however, that he is a "physical organic chemist" who not only has conducted unspecified "studies on explosive, combustible mixtures" but has "read the TMI-2 investigative reports and has the background through academic and practical training" and through "years of reading AEC and NRC documents, to understand and evaluate them." CSEG also maintains that Mr. Riley has the "early engineering background to understand containment information." This background, according to CESG, qualified Mr. Riley as an expert under Rule 702 of the Federal Rules of Evidence. Br., pp. 26-27.⁴⁴

b. Regrettably, the Licensing Board did not fulfill its ironclad obligation to explicate its reasons for finding that Mr. Riley's background was inadequate to meet the qualifications of an expert in areas of "hydrogen burning or detonation" or "strength of the containment structure."⁴⁵ See, e.g., *Public Service Electric and Gas Co. (Hope Creek Generating Station, Units 1 and 2)*, ALAB-429, 6 NRC 229, 237 (1977); *Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2)*, ALAB-422, 6 NRC 33, 41 (1977), *affirmed*, CLI-78-1, 7 NRC 1 (1978), *affirmed sub nom. New England Coalition on Nuclear Pollution v. NRC*, 582 F.2d 87 (1st Cir. 1978). Nonetheless, the path it followed in ruling on the matter is sufficiently discernible on the record before us to obviate a remand for further elucidation. See *Bowman Transportation, Inc. v. Arkansas-Best Freight System, Inc.*, 419 U.S. 281, 286 (1974).

⁴³ The Board acknowledged that certain portions of Mr. Riley's testimony were within his sphere of competence (chemistry). In that regard, it stated (Tr. 3967):

We have read through those statements and our concern is lessened by the fact that most of that information is already in the record, and it's the intention of this Board to look at those other aspects that might not be in the record and satisfy ourselves that any significant aspects of that are introduced in the cross-examination of witnesses to come. If that is not satisfied in that manner, then the Board will take actions to correct that situation.

⁴⁴ Rule 702 provides: "If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise."

In urging affirmance of the rejection of Mr. Riley's testimony, the applicant and the staff do not challenge the applicability of Rule 702 to NRC adjudicatory proceedings.

⁴⁵ The Board's stated explanation at the hearing was merely its reference to the "lack of qualifications of the witness to render those opinions as an expert." Tr. 3969. Its supplemental initial decision incorporated by reference the *voir dire* examination of Mr. Riley as well as the oral arguments of counsel for and against the admission of Mr. Riley's testimony. 13 NRC at 664 (citing Tr. 3875-3967).

The Commission Rules of Practice do not expressly state the standard for judging whether a prospective witness qualifies as an expert.⁴⁶ In that circumstance, we find the standard incorporated in Federal Rule 702 to be a suitable test for determining the propriety of the Licensing Board's rejection of Mr. Riley's claim of expert status. As noted above (fn. 44, *supra*), that rule allows a witness qualified as an expert by "knowledge, skill, experience, training, or education" to testify "[i]f scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue." The accompanying Advisory Committee notes state that "[w]hether the situation is a proper one for the use of expert testimony is to be determined on the basis of assisting the trier." Notes of Advisory Committee on Proposed Rules, 28 U.S.C.A., Federal Rules of Evidence, fol. Rule 702.

Mr. Riley is a chemist by profession, with a Master's degree in that subject.⁴⁷ As noted earlier, he does not lay claim to being a structural engineer as well. Nor does he profess to have had extensive training in, or professional involvement with, the theories of combustion, flame propagation, and explosives. Tr. 3903-04. Rather, as presented in CESG's brief to us, his claimed expertise on the subjects at issue rests mainly on his asserted ability to "understand and evaluate" matters of a technical nature due to his background of "academic and practical training" and "years of reading AEC and NRC documents." Br., pp. 26-27. From all that was presented to the Licensing Board, then, it cannot be said that Mr. Riley possesses any special "knowledge, skill, experience, training, or education" germane to the matters which his proposed testimony addressed.⁴⁸ In these circumstances, we are constrained to conclude that the Licensing Board did not abuse its discretion in declining to allow Mr. Riley to present opinion evidence on containment strength and hydrogen generation and control. *N.V. Maatschappij Voor Industriële Waarden v. A.O. Smith Corp.*, 590 F.2d 415, 418 (2d Cir. 1978).

2. Following the Board's rejection of Mr. Riley's proffered testimony, CESG moved the admission of 19 documents (CESG Exhibits 40, 42-56, 58-60) into evidence. Tr. 4636. Although those documents had undergirded

⁴⁶ 10 CFR 2.733, however, authorizes a party's use of "a qualified individual who has scientific or technical training or experience to participate on behalf of that party in the examination and cross-examination of expert witnesses." The rules thus clearly contemplate the use of experts as both witnesses and interrogators.

⁴⁷ Riley Testimony, *supra*, attachment (Professional Qualifications).

⁴⁸ We understand CESG also to imply that Mr. Riley — because of his general background, experience, and familiarity with AEC and NRC documents — could have somehow materially aided the Licensing Board in understanding the issues at hand. On that score, it is enough to note that all three members of that Board (including the Chairman) hold doctorates in one or another scientific discipline.

that testimony (Tr. 3782), CESG maintained that they "can stand on their own" (Tr. 4644). The Licensing Board admitted Exhibits 40, 59 and 60 but denied the motion as to the others on the ground that "they were offered in support of Mr. Riley's testimony, which has not been received in evidence," and that therefore there was no "need for burdening the record with these documents." Tr. 4654.⁴⁹

CESG also moved the admission into evidence of two documents identified as CESG's Exhibits 61 and 62. Tr. 4523-24, 4878-81. The Board admitted Exhibit 61 (Tr. 4525-26) but refused to accept Exhibit 62 for the reason that it represented a document, the reliability of which was in doubt because it had not been vouched for by an expert (Tr. 5020-21). Essentially for that same reason, the Board modified its earlier ruling regarding CESG's Exhibit 59 to provide that it, together with staff's Exhibit M,⁵⁰ would not be taken for the truth of the matter asserted therein. Tr. 4663.

Attacking both the exclusion of most of its tendered exhibits and the limitation placed by the Licensing Board on the use of Exhibit 59 and staff's Exhibit M, CESG asserts that an administrative agency cannot constitutionally impose a higher standard for the admission of evidence than that obtaining in a federal court. Br., p. 18. It then insists that the excluded documents were "government agency or consultant reports" and, as such, admissible under Rule 803(8) of the Federal Rules of Evidence, which codifies the "official records" exception to the hearsay rule. *Id.* at pp. 19-20.⁵¹

We need not decide whether the exception to the hearsay rule embodied in Federal Rule 803(8) pertains to the documents excluded by the Licens-

⁴⁹ The rejected documents are listed in Appendix B to this decision.

⁵⁰ Staff sought to place its Exhibit M into the record only "as a document that was referred to in this proceeding" and not to serve as competent evidence itself. Tr. 4657. Objecting to this limitation, CESG moved to introduce the exhibit into the record for "all purposes." *Ibid.*

⁵¹ Rule 803(8) reads in its entirety as follows:

Public records and reports. Records, reports, statements, or data compilations, in any form, of public offices or agencies, setting forth (A) the activities of the office or agency, or (B) matters observed pursuant to duty imposed by law as to which matters there was a duty to report, excluding, however, in criminal cases matters observed by police officers and other law enforcement personnel, or (C) in civil actions and proceedings and against the Government in criminal cases, factual findings resulting from an investigation made pursuant to authority granted by law, unless the sources of information or other circumstances indicate lack of trustworthiness.

ing Board.⁵² Hearsay evidence is generally admissible in our administrative proceedings. *Duke Power Co. (Catawba Nuclear Station, Units 1 and 2)*, ALAB-355, 4 NRC 397, 411-12 (1976). Thus, whether certain evidence falls within an exception to the hearsay rule is beside the point. Instead, the admissibility of evidence in NRC adjudications is governed by 10 CFR 2.743(c), which provides that "[o]nly relevant, material, and reliable evidence which is not unduly repetitious will be admitted."

Although the Licensing Board again failed to explicate fully its reasons for excluding each of the documents in question (see p. 474, *supra*), the gist of its determination appears to be that the documents are either unreliable for lack of an expert sponsor, irrelevant, or repetitious. We have reviewed the evidence in question and, in general, we agree with the Board's rulings.

Many of the tendered documents recite and analyze the events at TMI-2. See, e.g., CESG Exhs. 42-45, 48-50, 54-56. The record, however, already contained adequate, undisputed testimony relating to those aspects of the TMI-2 accident most relevant to the discrete issues in this reopened proceeding. See 13 NRC at 661 and portions of the record cited therein. CESG fails to show what relevant, nonrepetitive information these exhibits would have contributed to the proceeding. Similarly, the added value of Exhibits 52, 53, and 58 is not apparent.

The other excluded exhibits (CESG Exhibits 46, 47, 51, 59, 62, and Staff Exhibit M) consist of technical analyses, conclusions and opinions on various aspects of the matter of hydrogen generation and control in nuclear power reactors. This manifestly is the type of evidence that calls for sponsorship by an expert who can be examined on the reliability of the factual assertions and soundness of the scientific opinions found in the documents. Cf. *Wisconsin Electric Power Co. (Point Beach Nuclear Plant, Unit 2)*, ALAB-78, 5 AEC 319, 332-33 (1972) (citing *Dolcin v. FTC*, 219 F.2d 742, 748 (D.C. Cir. 1954), *certiorari denied*, 348 U.S. 981 (1955)).⁵³

CESG nonetheless points out that, as to three of the exhibits (59, 62 and M), it had unsuccessfully sought to subpoena sponsoring witnesses. Tr. 4874-79. The Licensing Board denied these subpoena requests on the ground that CESG had not established "exceptional circumstances" requir-

⁵² We do note, however, that several of the documents in question are not even "public records" (e.g., CESG Exhs. 45, 48, 49, 54, 55, 56) and that it is questionable whether consultants' reports fall within the ambit of investigative and evaluative reports in Rule 803(8)(C). See Notes of Advisory Committee on Proposed Rules, 28 U.S.C.A., Federal Rules of Evidence, fol. Rule 803.

⁵³ These documents are not unlike the reports of the Advisory Committee on Reactor Safeguards. These cannot be admitted into evidence for the truth of the matter stated therein because ACRS members are generally not subject to examination as witnesses. *Arkansas Power and Light Co. (Arkansas Nuclear One Unit 2)*, ALAB-94, 6 AEC 25, 32 (1973).

ing the witnesses' presence, pursuant to 10 CFR 2.720(h)(2)(i). Tr. 5020. See also Tr. 4985-5020.⁵⁴ We need not decide, however, whether the Board erred in this determination. Although the matter is by no means free from doubt, on its appeal CESG has not demonstrated the existence of prejudicial error in the Board's denial of the subpoenas.

Exhibit M is a technical report addressing the "anomalous" Livermore test results respecting the combustion of hydrogen/steam mixtures. As we have seen, those test results were fully explored at the hearing. See pp. 470-472, *supra*. Exhibit 59 is a technical report prepared by the Brookhaven Laboratory which analyzed various matters relating to hydrogen generation and control at the Sequoyah facility. That report and its significance was likewise the subject of considerable testimony, including cross-examination by CESG's counsel. See, e.g., Tr. 4069-70, 4075-76, 4088-94, 4358, 4398-4401, 4423-31, 4462-64. See also admitted CESG Exhs. 40 and 40A. Exhibit 62 is Chapter 8 of a draft consultant report entitled "Reactor Safety Study, Methodology Applications Program, Sequoyah #1 PWR Power Plant," NUREG/CR-1659 (February 1981). That chapter analyzed, *inter alia*, the probability and consequences of hydrogen burning and detonation for several different "hypothesized core meltdown accidents in the Sequoyah PWR." It, too, was the subject of some direct and cross-examination during the testimony of a staff witness. See, e.g., Tr. 4451-64.⁵⁵

Thus, all three exhibits were explored in testimony at the hearing. CESG has offered no cogent explanation as to how the formal admission of these exhibits, with or without the sponsorship of subpoenaed staff witnesses, would have materially contributed to the development of the record or might have altered the outcome of this case. We find no error warranting reversal.⁵⁶

⁵⁴ 10 CFR 2.720(h)(2)(i) provides that the testimony of NRC personnel, other than those already made available by the Executive Director for Operations, may not be required at a hearing unless there is "a showing of exceptional circumstances, such as a case in which a particular named NRC employee has direct personal knowledge of a material fact not known to the [already available] witnesses."

⁵⁵ Exhibit 62 was part of the same report that contained Exhibit 61, a one-page table summarizing dominant accident sequences for Sequoyah. The Board admitted the latter (Tr. 4525-26) and cited it in its opinion (13 NRC at 668). The testimony concerning the two exhibits is intertwined (see Tr. 4451-64, 4880), making it difficult to understand the Board's admission of one and exclusion of the other. We note, however, that although Exhibit 62 analyzed the S2D sequence on Sequoyah, the bulk of the chapter dealt with "accident processes" well beyond the scope of hydrogen generation and control during a TMI-2 type accident and thus was beyond the scope of this proceeding.

⁵⁶ In any event, we reiterate that the Commission is fully aware of the debate concerning the adequacy of a hydrogen control system like that at McGuire. Applicant is obliged, pursuant to Commission-imposed license conditions, to continue its research in this area and to establish the long-term adequacy of any hydrogen control system. See p. 472, *supra*.

3. CESH also objects to the Licensing Board's denial of a subpoena for Louis Charles Barbe, Br., pp. 28-29. Mr. Barbe's testimony, offered in support of contentions 1 and 2, assertedly was to concern "the human factors involved in reactor operation."⁵⁷ The particular focus of the proposed direct examination of this witness was plant and operator response to a control room fire and other such hazards.⁵⁸ The Board noted the absence of any control room fire issues in this proceeding and denied the subpoena for lack of relevance. Tr. 3480-81.

We agree with the Board's ruling. To the extent that Mr. Barbe's testimony was to relate to control room fire issues, the subpoena request fails to establish the "general relevance of the testimony * * * sought"⁵⁹ to the TMI-2 issues of hydrogen generation and control. Other matters raised in the proposed direct examination ostensibly touched on hydrogen generation and mitigation systems but were not linked to the TMI-2 type LOCA that was contemplated in contentions 1 and 2 and that defined the scope of this proceeding. Moreover, Mr. Barbe's resume does not suggest any background in LOCA-initiated hydrogen generation and control at nuclear power facilities.⁶⁰ In these circumstances, we agree with the Board that the general relevance of the proffered testimony of Mr. Barbe is not apparent and thus find no reversible error.

4. On the last day of the hearing, there was extensive testimony concerning the polyurethane foam used in the insulation of the ice condenser. Tr. 5104-73. The apparent concern was that, in the event of a hydrogen burn following a TMI-2 type accident, (1) the polyurethane would decompose from heat (pyrolysis); and (2) the gases from the decomposition would burn, increasing the pressure within the containment. Applicant's witness, however, expressed the opinion that the "additional energy increment" from burning of the polyurethane gases would be "insignificant" and that containment pressure essentially would not be increased. Tr. 5119.

⁵⁷ CESH application for subpoena (February 26, 1981), at p. 2. See also Tr. 3446-47.

⁵⁸ CESH application for subpoena, *supra*, attachment (Barbe Direct Examination).

⁵⁹ 10 CFR 2.720(a).

⁶⁰ CESH application for subpoena, *supra*, attachment (Barbe Resume). CESH argues on appeal that Mr. Barbe's testimony could have provided the "background with respect to operation of nuclear power reactor facilities" lacking in the five psychologists who testified for CESH on operator training. Br., p. 28 (citing 13 NRC at 664). But at no point has CESH explained from what experience Mr. Barbe's familiarity with reactor facilities derives. In fact, his resume reflects no background in nuclear engineering, despite CESH's assertion that Mr. Barbe is a "former Westinghouse nuclear division engineer." CESH application for subpoena, *supra*, attachment (Listing of Proposed Witnesses). Rather, Mr. Barbe was Manager of Accident Prevention for Westinghouse Electric Corp. and has held numerous other positions in the safety, fire protection, and industrial hygiene fields.

At the close of the hearing, the staff requested and was granted additional time to review the record on this subject and to file further testimony, if necessary (with the right given the other parties to respond). Finding the record "sufficiently full" on this score and having no "substantial information to add," the staff filed an affidavit on a detailed point of ice condenser construction to provide "a more accurate depiction of the plant as constructed." March 27, 1981 letter from Staff Counsel and accompanying Affidavit of Noonan, et al. On that same day, CESH filed an affidavit of Mr. Riley with his observations of the ice condenser during a tour of the McGuire facility and his views on the additional contributions to the plant's containment pressure from polyurethane decomposition and burning. The applicant later filed a response to staff's affidavit. See 13 NRC at 673.

The Licensing Board admitted the staff's and applicant's affidavits but found CESH's "not in response" to the staff affidavit. *Ibid.* In its brief, CESH asserts that Mr. Riley's affidavit "is obviously relevant and should have been accepted into the record," but fails to explain the respect in which its admission might have affected the outcome. Br., p. 24. CESH has thus not established prejudicial error.

III. Other Exceptions

As noted at the outset, CESH also filed exceptions to the Licensing Board's April 1979 initial decision. There the Board ruled against a number of contentions raised by CESH relating to, *inter alia*, the need for the McGuire plant to meet the anticipated power demands on applicant's system, the availability of other alternatives to meet that demand, and the cost-benefit balance of the plant.

CEHG cites 11 instances in which the Licensing Board assertedly erred in its disposition of those contentions (Exceptions 18-28). Its brief, however, offers no *record* support for its claims. Rather, CESH attempts to support those claims by unsubstantiated references to developments purportedly occurring after the record closed. Br., pp. 38-42. For example, arguing against the need for the plant, CESH alleges that the actual growth in peak demand for electric power is less than previously predicted. *Id.* at pp. 38-39. And, in urging that the NEPA cost-benefit balance should now be struck against the plant, CESH directs attention to the increase in plant capital costs since the time of the earlier estimates. *Id.* at pp. 39-42.

The appeal at hand must be decided on the basis of the Licensing Board record before us. If CESH believed there was sufficient cause to reopen the record on NEPA issues, it was free to seek such relief (as it successfully did in connection with the hydrogen issue). *Cf. ICC v. Jersey*

City, 322 U.S. 503, 514 (1944). In the circumstances, we strike Exceptions 18-28 for want of any offered record support. See 10 CFR 2.762(a), (e).

We have examined the remainder of CESG's claims of error and find them either without substance or inadequately briefed. See *Public Service Electric and Gas Co.* (Salem Nuclear Generating Station, Unit 1), ALAB-650, 14 NRC 43, 49-50 (1981).

To the extent they are consistent with this opinion, the Licensing Board's April 18, 1979 initial decision and May 26, 1981 supplemental initial decision are affirmed.

We also find reasonable assurance that the hydrogen mitigation and control system at McGuire can be operated without endangering the health and safety of the public, during the interim period in which applicant and the Commission continue to explore the adequacy of the system in place and possible long-term alternatives.

It is so ORDERED.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the Appeal Board

Mr. Rosenthal, concurring:

The Licensing Board concluded that there was no occasion to decide whether the evidence established that the applicant's hydrogen mitigation system would avert a containment breach in the event of an accident of the TMI-2 variety. The foundation of that conclusion was two-pronged: (1) the Commission's explicit ruling in the *TMI-1 Restart* proceeding that hydrogen control measures need be considered only in the context of a "credible" loss-of-coolant accident;¹ and (2) the Board's finding that the occurrence of a TMI-2 type accident at McGuire was "not credible".

As the majority opinion points out, and as seems beyond serious doubt, the *TMI-1 Restart* guidance was correctly taken by the Licensing Board to apply here. In the circumstances, it is not surprising that a principal question raised by the CESG appeal was whether that Board's finding on the "credible" issue was in error.

¹ *Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit No. 1)*, CLI-80-16, 11 NRC 674, 675 (1980).

Nonetheless, the majority opinion sidesteps that question. Its basis for doing so is the Commission's June 29, 1981 order addressed to whether the supplemental initial decision (authorizing the issuance of full-power, full-term operating licenses for the two McGuire units) should be allowed to become immediately effective. CLI-81-15, 14 NRC 1. In the course of paving the way for the issuance of such a license for Unit 1 alone, the Commission took note of the fact that the applicant had agreed to install and use an igniter hydrogen mitigation system. It added, without explanation, that it "believe[d] that in this case installation and use of an appropriate hydrogen mitigation system is required for adequate protection of the public health and safety". *Id.* at 2.

I can certainly agree with my colleagues that this pronouncement provided sufficient cause for our independent examination of the adduced evidence on the efficacy of the McGuire hydrogen control mitigation system and the making of findings *ab initio* on that matter. Similarly, I fully subscribe to the analysis of that evidence contained in the majority opinion and each of the determinations which flowed therefrom. I must, however, record my disagreement with the refusal of my colleagues also to pass judgment upon CESG's challenge to the ground of the decision below. More specifically, I believe that, in the absence of an explicit contrary directive from the Commission, our obligation to consider and determine those issues which the CESG appeal properly put before us could not be erased by the June 29 order *per se*. I now turn to the underpinnings of this conclusion.

1. The "immediate effectiveness" review which culminated in the June 29 order was conducted under the authority of 10 CFR 2.764, as it had been then-recently amended. 46 *Fed. Reg.* 28627 (May 28, 1981). In relevant part, Section 2.764(f)(2) provides that, in the instance of a licensing board initial decision authorizing the issuance of a full-power operating license, the Commission will determine on its own initiative whether to stay the effectiveness of that decision.² The Section goes on to set forth the criteria which will be employed in making that determination. Although those criteria do not wholly correspond with the standards which govern decisions on *motions* for a stay of an initial decision filed under 10 CFR 2.788(e), there is at least a partial overlap. For example, one of the factors that the Commission is to take into account in its Section 2.764(f)(2) review is "the likelihood that [an important substantive issue] has been resolved incorrectly below"; in ruling upon a Section 2.788(e)

² Until that determination is made, the initial decision is automatically stayed.

stay motion, it must be determined, *inter alia*, whether “the moving party has made a strong showing that it is likely to prevail on the merits”.³

In a two-tier appellate review system such as that prevailing in this agency, it is not customary for the superior tribunal to take a look itself at the merits of a trial-level decision in advance of any scrutiny of that decision by the intermediate appellate body. And, where (as here) there is a prescribed departure from the usual procedure in this regard, a question naturally arises respecting the implications of the determinations of the highest authority in terms of the later appraisal of the same aspects of the trial-level decision by its subordinate. The Commission was not insensitive to this consideration and dealt with it directly. Section 2.764(f)(2)(vi) states explicitly that “[i]n operating license cases, the Commission’s review under this section is without prejudice to Appeal Board * * * decisions * * *”. Consistent with this declaration, the June 29 order emphasizes that “[t]his effectiveness decision is without prejudice to * * * the normal appellate review of the Licensing Board’s decision by the Appeal Board * * *”. 14 NRC at 2.⁴

2. Patently, had the Commission’s June 29 order not alluded to the need for an “appropriate” hydrogen mitigation system at McGuire, we would have been duty-bound to decide the principal issue presented by the appeal: the validity of the Licensing Board’s finding that the occurrence of a TMI-2 type accident at McGuire was “not credible” within the meaning of the May 1980 *TMI-1 Restart* order. For, once again, there appears to be general agreement that that Board had not misread the scope and effect of the latter order; *i.e.*, its teachings applied to McGuire and required an evaluation of the adequacy of the applicant’s hydrogen mitigation system in this proceeding only if a TMI-2 type accident at that facility was found “credible”.

Thus, my colleagues have allowed the June 29 order to have a substantial — indeed dispositive — impact upon what issues presented by the CESC appeal we would decide. As earlier noted, I have no quarrel with the election to employ that order as a springboard for a full evaluation of the McGuire hydrogen mitigation system. Given the Commission’s articulated belief that an “appropriate” system of that stripe was required, it made good practical sense to pursue that course (so long as there was a

³ The provisions of, and interaction between, Sections 2.764(f)(2) and 2.788(e) were discussed more fully in our decision denying CESC’s motion for a stay of the supplemental initial decision, rendered two days after the Commission’s June 29 order. ALAB-647, 14 NRC 27, 29-30.

⁴ Section 2.764(f)(2)(v) does provide, *inter alia*, for the furnishing of specific instructions to the Appeal Board in connection with the latter’s review. No such instructions were issued in the June 29 order.

sufficient record foundation for the evaluation).⁵ But I do not understand how it can be suggested that we honor the Commission's admonition that its order was without "prejudice" to Appeal Board review when we use that order as providing, of itself, justification for not reaching an issue which was both crucial to the outcome of the case below and the focal point of the appeal.⁶

In this connection, what would my colleagues have done had there been no (or an insufficient) evidentiary record on the efficacy of McGuire's hydrogen mitigation system? Would they still have declined to pass on the "credible" issue on the strength of the June 29 order? If so, our only recourse would have been to vacate the supplemental initial decision and remand the cause to the Licensing Board with instructions to take further evidence on the hydrogen mitigation system and to render a new decision turning upon the adequacy of the system. In such circumstances, there most assuredly would have been no room for any claim that the June 29 order had not "prejudiced" the outcome of the appellate review. It would have not merely prejudiced, but wholly determined that outcome.⁷

3. My misgivings regarding the effect which my colleagues have given to the Commission's June 29 order in scoping our appellate review are reinforced by that order itself. As previously noted, the order does not illumine the precise basis upon which the Commission collegially concluded that public health and safety considerations dictated the installation and use of an "appropriate" hydrogen mitigation system. To be sure, in separate additional opinions, individual Commissioners laid bare their quite divergent views on some aspects of the hydrogen generation problem. 14 NRC at 4-13. But the opinion for the Commission as a whole contains no explicit or implicit indication that the *TMI-1 Restart* guidance was being overturned.

By this observation, I intend no criticism of the Commission. Apart from the fact that it is not my role to assess the wisdom or completeness of the decisions of superior tribunals, I can readily understand why, in the

⁵ Whether what was said in the June 29 order imposed a *legal* obligation upon us to examine the sufficiency of the hydrogen mitigation system (assuming the Licensing Board had correctly decided the "credible" issue) is another matter.

⁶ Notwithstanding my colleagues' disclaimer in their footnote rejoinder on this matter, I remain persuaded that such is the reality of what has occurred here. Otherwise, I would have cast this opinion quite differently.

⁷ The Commission obviously was aware that the Licensing Board had made no findings on the efficacy of the McGuire hydrogen mitigation system. Yet, despite its stated belief that such a system was required, it neither ordered a remand to the Licensing Board nor directed us to make the requisite findings (if possible on this record). While I reiterate that it was proper for us to adopt the latter course on our own, the Commission's silence in that respect cautions against giving the statement in question the adjudicatory significance attributed to it by my colleagues.

totality of circumstances, the Commission might have found it neither necessary nor feasible to dwell at length upon any of the conclusions summarily set forth in the June 29 order. That order, after all, was not the product of a detailed review of the Licensing Board decision and underlying record, following full briefing and possible oral argument. Rather, it issued but a month after the supplemental decision (in recognition of the time limitation which the Commission imposed upon itself in Section 2.764(f)(2)(iv)) and had a clearly defined and limited purpose: that of determining merely whether the public interest would be best served by allowing the supplemental initial decision to become effective before appellate review had taken place. My point is simply that the absence of any hint that the Commission was rescinding the *TMI-1 Restart* guidance supplies a particularly compelling reason why we should have proceeded to decide the raised issue as to whether the guidance was correctly applied on the record of this case — rather than simply discard the issue as having been impliedly declared moot by the Commission.⁸

It may be that, in this particular instance, no operative significance will attach to my colleagues' resort to the June 29 order in determining what tendered appellate issues should be considered by us. But even if this be so, the question of the propriety of that action retains future importance. It is a virtual certainty that the Commission will be called upon with increasing frequency to conduct "immediate effectiveness" reviews of licensing board initial decisions in operating license proceedings. And it is reasonable to suppose that, as in this case, the order issued in connection with at least some of those reviews will contain conclusions which might appear "without it being so stated by the Commission) to have a bearing upon the necessity that an appeal board reach a specific issue presented to it on a Section 2.762(a) appeal. Thus, it can be expected that the situation which has confronted and divided us here will recur — very possibly in a context where the appeal board's treatment of it will have a discernible effect upon the outcome of the appeal.

It is essentially for this reason that, notwithstanding my full endorsement of the outcome of our deliberations in the present case, I have felt constrained to ventilate the foregoing concerns. As I see it, there is ample warrant for further Commission guidance respecting the use to be made by

⁸ I do not wish to be understood as believing that a decision on that issue necessarily would have been easy. The term "credible" is not defined in the *TMI-1 Restart* order and, to my knowledge, it has not elsewhere acquired a settled meaning for NRC regulatory purposes. Nor for those purposes is the standard dictionary definition particularly illuminating.

the appeal boards of a statement contained in a Section 2.764(f)(2) order which is not accompanied by explicit instructions as to the effect that is to be given that statement in the course of the normal appellate review. I am hopeful that that guidance will be forthcoming.

Dr. Buck and Ms. Kohl have authorized me to state that, although in disagreement with my views on the propriety of not reaching the "credible" issue here, they share the belief that it would be helpful if the Commission clarified its intent respecting the effect which appeal boards are to accord Section 2.764(f)(2) orders.

APPENDIX A

The MARCH and CLASIX Computer Codes

The MARCH code computes, among other things, the rate of hydrogen generation that results from uncovering and overheating of the core.¹ The MARCH code, developed and used by Battelle, Columbus Laboratory in this proceeding, modeled the upper and lower containment compartments with the ice condenser as a junction, not a separate segment. Staff Exh. K, fol. Tr. 4353, at p. 26. The code included models for ice bed heat removal, structural heat sinks, return air fans and containment sprays. *Ibid.*²

The CLASIX code, developed by Westinghouse/Offshore Power Systems, is a multi-volume containment code³ "which calculates the containment pressure and temperature response in the separate compartments." *Id.* at pp. 20-21. See also Applicant Exh. 5B, at pp. 2-15 - 2-20. The CLASIX code also models the containment air return fans, spray and flow paths through the ice condenser doors, and can track the distribution of the important components in the containment atmosphere (oxygen, nitrogen, hydrogen and steam). Staff Exh. K, fol. Tr. 4353, at p. 21. See also Applicant Exh. 5B, at p. 2-16, Figures 1 and 2, fol. p. 2-20.

¹ As explained by the staff, the rate of hydrogen production is usually steam limited: "The rate of hydrogen release from the primary system depends on the rate of steam release and the mass fraction of hydrogen in the total steam volume." Staff Exh. K, fol. Tr. 4353, at p. 18.

² The sprays are assumed, due to code restraints, to remove heat only after all the ice is melted. *Id.* at p. 26.

³ The model for McGuire utilized six volumes which were interconnected by appropriate flow paths. Applicant Exh. 5B, at p. 2-15. This permits representation of several of the major subcompartment volumes, *e.g.*, the upper containment volume, the ice condenser, and the lower containment volume, which is divided into several subvolumes.

APPENDIX B

Documents Excluded by the Licensing Board

Exhibit Number	Title of Document	Institutional Author	Summary Description
42	"Analysis of the TMI Accident and Alternative Sequences," NUREG/CR-1219 pp. V-Vi, 1-1 - 1-4, 2-1 - 2-8	Battelle, Columbus Laboratory	Portions of MARCH computer code analyses of variations in system operation in a TMI-accident scenario. Portions consist of the Abstract and Summary sections and a factual recitation of the TMI accident.
43	<i>Id.</i> , pp. 5-1, 5-18, figs. 5-3, 5-4, 5-5		Portions consisting of MARCH analyses of alternative scenarios.
44	<i>Id.</i> , pp. 8-1 to 8-8		Portions consisting of MARCH analyses of hydrogen burning in TMI Accident.
45	"Testimony of A. D. Miller Regarding Hydrogen Production at TMI"	NSAC	Proposed applicant testimony by a Nuclear Safety Analysis Center (NSAC) member of events leading to, and amount of hydrogen generated during, the TMI accident. Contains portions

Exhibit Number	Title of Document	Institutional Author	Summary Description
46	"Hydrogen Problems in Sequoyah Containment"	R&D Associates	of "NSAC-1" study (11 pages, & figures). Report to NRC on ice condenser plant containment response to hydrogen production, burning and mitigation by igniters (7 pages & appendices).
47	Memorandum	NRC	NRC technical memorandum commenting on Commission Paper SECY-80-107, "Proposed Interim Hydrogen Control Requirements for Small Containments" (7 pages & figures).
48	NSAC-1 "Analysis of Three Mile Island Unit-2 Accident." Figures TH9, TH10, TH11	NSAC	Portions of a Study (NSAC-1) of the TMI-2 accident, consisting of 3 diagrams related to the TMI-2 ECCS.
49	<i>Id.</i> , Appendix PDS, pp. 12-14	NSAC	Portions of an appendix describing the

Exhibit Number	Title of Document	Institutional Author	Summary Description
50	Memorandum	NRC	TMI-2 plant computer. NRC memorandum analyzing and evaluating selected TMI-2 containment related issues (7 pages).
51	"Sequoyah Containment Analysis"	R&D Associates	Critique of Ames analysis of Sequoyah Containment (22 pages).
52	Memorandum	NRC	NRC memorandum with attached McGuire draft SER Supplement (4 pages).
53	Transcript of 248th ACRS Meeting, Dec. 5, 1980, pp. 339-405	NRC	Portion of transcript discussing North Anna 2 Residual Heat Removal System.
54	NSAC-1, <i>supra</i> , Appendix ERV, pp. 1-5.	NSAC	Portion of NSAC-1 appendix discussing the TMI-2 Electromatic Relief Valve.
55	<i>Id.</i> , Appendix PDS, pp. 1-6	"	Appendix to NSAC-1 discussing plant

Exhibit Number	Title of Document	Institutional Author	Summary Description
56	<i>Id.</i> , Figures OTSG-1 and OTSG-2, and Appendix RCPCS-1	NSAC	data sources for TMI-2 accident. Diagrams relating to TMI-2 steam generator system.
58	"NRC Staff Answers to CESG interro- gatories and Requests for Documents"	NRC	NRC Staff answers to various questions posed by CESG.
59	"Some Very Preliminary Results of Short-Term Analysis (3- week study) of Hydrogen Combustion during Degraded Core Accidents in the Sequoyah Nuclear Plant in the Presence of Glow Plugs"	Brookhaven National Laboratory	Evaluation of consequences of H ₂ burning in a wide range of degraded core accidents in a PWR ice condenser plant with ignition sources installed (10 pages, 139 figures).
62	"Reactor Safety Study Methodology Applications Program: Sequoyah #1," Chapter 8, NUREG/CR- 1659.	Sandia National Laboratories	Accident Process Analysis for Sequoyah (13 pages plus figures & tables).

Exhibit Number	Title of Document	Institutional Author	Summary Description
Staff M	"Some Hydrogen Control Considerations for Ice Condenser Nuclear Plants"	R&D Associates (for Lawrence Livermore National Laboratory).	Analysis and interpretation of igniter tests (26 pages including computations).

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Alan S. Rosenthal, Chairman
Thomas S. Moore
Christine N. Kohl

In the Matter of

Docket No. 50-255 SP

CONSUMERS POWER COMPANY
(Palisades Nuclear Power
Facility)

March 31, 1982

The Appeal Board reverses a Licensing Board's order, LBP-81-26, 14 NRC 247 (1981), denying the request of a labor union representing the plant's control room operators for a hearing on an NRC enforcement order restricting, *inter alia*, overtime work by the operators, and remands the case to the Licensing Board for further proceedings.

RULES OF PRACTICE: INTERVENTION (DISCRETIONARY)

The Commission has broad discretion to provide hearings or permit intervention in cases where the avenues of public participation are not available as a matter of right. *Public Service Company of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), CLI-80-10, 11 NRC 438, 442 (1980). The Commission has generally empowered its adjudicatory boards with the same discretion to allow intervention in licensing and enforcement cases.

RULES OF PRACTICE: INTERVENTION PETITIONS

For purposes of ruling on an appeal from the denial of a hearing petition, all material allegations of the intervenor's petition generally must be accepted as true.

APPEARANCES

Mr. Theodore Sachs and Ms. Laura J. Campbell, Detroit, Michigan, for the appellants, Utility Workers Union of America, AFL-CIO, and the Michigan State Utility Workers Council.

Mr. Judd L. Bacon, Jackson, Michigan, for the licensee, Consumers Power Company.

Mr. Stephen G. Burns for the Nuclear Regulatory Commission staff.

DECISION

Opinion of the Board by Mr. Moore (in which Mr. Rosenthal and Ms. Kohl join):

The union serving as collective bargaining agent for the licensed operators at the Palisades Nuclear Power Facility¹ appeals the denial of its hearing petition challenging a "confirmatory order" issued by the NRC's Director of the Office of Inspection and Enforcement. The order restricts overtime for the licensed operators at that Consumers Power Company's plant to a degree greater than the agency's generally applicable limitations on such work. The union asserts that the ordered restriction lacks any factual basis and is unsupported by any reasonable safety considerations; rather, the overtime proscription was adopted by the Director after the licensee proposed it as part of a "make peace" offering following a period of stepped up enforcement actions against the company.² The Licensing Board held that the union lacked standing to challenge the order and that the Commission's referral of the hearing petition precluded the Board from granting discretionary intervention to the union. LBP-81-26, 14 NRC 247, 250-259 (1981). The Board also expressed the view that discretionary intervention for the union would, in any event, be inappropriate. *Id.* at 259-262.

We reverse. We do not believe that the Commission's referral order barred the grant of discretionary intervention or, in the circumstances presented, that such intervention should have been withheld. In permitting the union to intervene, we heed the Commission's counsel in *Portland General Electric Company* (Pebble Springs Nuclear Plant, Units 1 and 2),

¹ Appellants are the Utility Workers Union of America, AFL-CIO, and the Michigan State Utility Workers Council (collectively "union").

² See Reply of Utility Workers Union in Support of Hearing May 28, 1981, at 2.

CLI-76-27, 4 NRC 610, 616 (1976), that "our regulatory responsibilities can best be carried out by allowing intervention as a matter of discretion to some petitioners who do not meet judicial standing tests." We eschew the opportunity to resolve the standing question, however, because we hold considerable doubt that, as presented, this issue is likely to arise again in Commission proceedings.³

I.

On March 9, 1981 the Director of I&E issued an "Order Confirming Licensee Actions to Upgrade Facility Performance"⁴ which, as the title implies, reflects the licensee's prior consent to be bound by the terms of the order. Sections II, III and IV of the order describe its history.

Section II relates that, over the past several years, the NRC has cited the Palisades facility for numerous infractions of agency regulations. Inspections during the period September 1979 to September 1980 disclosed 41 items of noncompliance. The same period produced two enforcement actions. One, pending at the time of the order, involved a proposed civil penalty of \$450,000 for a continuing violation of containment integrity. The second entailed a penalty of \$16,000 for employee errors in misaligning valves for safety-related equipment. As a consequence of licensee's conduct, the NRC graded the facility's performance for reactor operations

³ Although standing questions occasionally surface in NRC adjudications outside the context of construction permit, operating license or license amendment proceedings, such instances are infrequent. Here, the standing issue arises in an enforcement action. Moreover, the question of the union's standing takes a form that makes it most unlikely to recur. In order to meet the "injury in fact" component of the familiar two-pronged standing test applicable to Commission proceedings (see *Pebble Springs*, *supra*, 4 NRC at 613-614), the union, as representative of its members, alleges that the confirmatory order caused a garden variety pocketbook injury to the employment opportunities of the Palisades' operators.

But it is the union's "zone of interest" argument that sets this case apart from the standing questions common to Commission proceedings. Rather than assert an interest within the penumbra of the statutes ordinarily administered by the Commission, the union alleges an interest arguably within the zone of interest of the federal labor statutes. In a federal court such an asserted interest seemingly would present no barrier to meeting the zone test. See *Arnold Tours, Inc. v. Camp*, 400 U.S. 45 (1970) *per curiam* (plaintiff travel agents found within zone of interest of one statute — the Bank Service Corporation Act — when, as revealed by underlying opinions (408 F.2d 1147 (1st Cir. 1969), *vacated*, 397 U.S. 315 (1970), *on remand*, 428 F.2d 359 (1st Cir. 1970), *reversed*, 400 U.S. 45, *supra*), they had alleged that actions by a national bank pursuant to a ruling of the Comptroller of the Currency violated National Bank Act's "incidental powers" restrictions). See also *Association of Data Processing Service Organizations v. Camp*, 397 U.S. 150 (1970). In the setting of an NRC administrative proceeding, however, it raises questions not readily amenable to resolution. Because we doubt the standing question presented by the union petition is likely to recur, we see no present necessity to decide the matter when our opinion would provide little practical guidance for future cases.

⁴ 46 *Fed. Reg.* 17688 (March 19, 1981).

and radiation protection "below average" among Region III licensees for the 1979-80 period.

Section III of the order recites the licensee's most recent infraction of agency rules: the January 6, 1981 failure of an electrical repairman to follow required procedures. This error caused a one-hour isolation of the 125 volt station batteries in violation of the technical specifications in Consumers' operating license and resulted in an "immediate action letter" to the licensee prescribing short term corrective actions.

The brief operating history recounted in the second and third sections of the order led the Director in section IV to conclude "that major changes in the licensee's management controls are necessary to assure that the licensee can operate the Palisades facility without undue risk to the health and safety of the public."⁵ To meet the agency's concerns, Consumers proposed a program to upgrade performance and assure safe operation at Palisades. Thereafter the licensee made certain additional commitments and, in section V of the challenged order, the Director confirmed all of these undertakings along with the earlier prescriptions contained in the agency's immediate action letter. As relevant here, paragraph B of that section states:

Extended overtime on the part of licensed operators shall be avoided by restricting the overtime for licensed operators as follows:

- (1) No more than 4 overtime hours in any 24-hour period;
- (2) No more than 24 overtime hours in any 7-day period;
- (3) No more than 64 overtime hours in any 28-day period.

The Director of Region III may relax or terminate any of the preceding conditions in writing for good cause.⁶

The final section of the Director's order contains the routine language of a notice of hearing; *i.e.*, any person having an interest affected by the order may request a hearing in accordance with the Commission's regulations. It concludes, however, with the statement that "[i]f a hearing is held, the issue to be considered at such hearing shall be: Whether, on the basis of the matters set forth in Sections II and III of this Order, this Order should be sustained."⁷

In response to the Director's order, the union filed with the Commission a timely petition seeking a hearing to challenge the validity of the confirmatory order's overtime restriction. In its petition, the union states that it is the exclusive bargaining agent for the licensed operators at the Palisades facility. It asserts that the order's overtime limitation on Pali-

⁵ *Id.*

⁶ *Id.* at 17689.

⁷ *Id.* at 17690.

sades operators is more restrictive than the Commission's otherwise applicable standards established as interim criteria for shift staffing.⁸ The petition therefore states (Pet. at 3) that the "employment opportunities" of its members are "adversely affected." The union seeks to have the overtime restriction set aside, alleging (*id.* at 2) that the restraint was proposed, not by the Commission, but by the licensee without notice or consultation with the union, and that "no reason was demonstrated or existed or was pertinent . . . to occasion greater restriction on overtime than is otherwise required by the Commission's general standards, or is permitted to the licensee under its collective bargaining obligations to the Union under the National Labor Relations Act."

The NRC staff opposed the union's hearing petition. It claimed that (i) the union is not entitled to a hearing because it lacks standing and (ii) a discretionary hearing would neither be a wise use of agency resources nor concern the health and safety mandate of the NRC.⁹ Rather than rule on the union petition, the Commission referred the matter to the Board below stating that:

The Commission hereby refers the March 31, 1981 request for a hearing to an Atomic Safety and Licensing Board to be appointed by the Atomic Safety and Licensing Board Panel Chairman to decide whether the Union should be granted a hearing. If the Licensing Board determines that a hearing is required, it should conduct the hearing.¹⁰

⁸ The interim shift staffing criteria are contained in a letter dated July 31, 1980 addressed to all licensees and applicants for licenses from the Director, Division of Licensing, Office of Nuclear Reactor Regulation. They provide that:

- (1) An individual shall not be permitted to work more than 12 hours straight (not including shift turnover time).
- (2) An individual shall not be permitted to work more than 24 hours in any 48 hour period.
- (3) An individual shall not work more than 72 hours in any 7 day period.
- (4) An individual shall not work more than 14 consecutive days without having two consecutive days off.

⁹ The licensee filed no opposition to the union petition. Rather, it informed the Commission that if the petition were granted the company wished to participate as a party in the subsequent hearing. Before us, however, Consumers filed a brief because it interpreted our order establishing a briefing schedule as a direction to file one. The licensee now argues that the union lacks standing to challenge the Director's order but that the Commission erected no bar to the Licensing Board's grant of discretionary intervention. On the question of whether the union should be allowed to intervene, the licensee takes the carefully crafted position that it is a close question which, on balance, disfavors union intervention.

¹⁰ Commission order, May 29, 1981 (unpublished).

II.

The Licensing Board held that the Commission's order referring the hearing petition divested the Board of all discretion to allow the union to intervene. It reasoned that the phrase "should be granted" in the referral order must be read in context with the word "required" in the following sentence so as to limit the Board's authority. This interpretation was appropriate, it said, because "[t]he use of discretionary hearings is rare in general, and unheard of in the context of an NRC enforcement action." 14 NRC at 259. Therefore, the Board concluded that "it is inconceivable to suggest that the Commission, without any clear directive so stating, wanted the Board to consider whether a discretionary hearing should be held . . ." *Id.*

We cannot accept the Licensing Board's reading of the Commission's referral order or its reasoning in support of that interpretation. Nothing in the pertinent language of the order demonstrates that the Commission intended to restrict the Board's authority exclusively to determining whether the union has standing and thus is entitled to intervene as a matter of right. In our view, the Commission's order says two things: (1) a licensing board is to decide whether the union should be granted a hearing; and (2) if so, the same board should proceed with the hearing.¹¹ Accordingly, we find no limitation on the authority of the Licensing Board to grant discretionary intervention to the union.¹²

In addition, we reject the Licensing Board's suggestion that the past dispensation of discretionary intervention to parties in Commission proceedings prejudices the future grant of such intervention. In *Pebble Springs, supra*, the Commission held that the agency could best fulfill its regulatory responsibilities in licensing proceedings by permitting broader public participation than is mandated by section 189a of the Atomic Energy Act of

¹¹ The operative language of the Commission's order states that a board was "to decide whether the Union should be granted a hearing. If the Licensing Board determines that a hearing is required, it should conduct the hearing." We reject the Licensing Board's view that the phrase "should be granted" ineluctably must be read in context with the word "required" in the following sentence. Indeed, to read the referral order in this fashion condones a redundancy. To place all emphasis on the word "required" and read it as a proscription on the Board's authority, in effect, renders superfluous the clause "to decide whether the union should be granted a hearing" in the previous sentence of the order. We think the more reasonable reading is to give equal meaning to all the Commission's words thereby placing all parts of the order on the same footing without any duplication or unwarranted emphasis.

¹² Moreover, at the time it referred the union's petition to the Licensing Board, the Commission had before it the staff's opposition which argued, *inter alia*, that a hearing should not be ordered as a matter of discretion. See NRC Staff's Response to Utility Workers Union of America's Request for a Hearing, April 20, 1981, at 6-10. In this circumstance, we believe that if the Commission intended to remove the Licensing Board's discretion to allow the union to intervene, it would have done so unmistakably.

1954.¹³ It then provided guidelines for the exercise of board discretion in ruling on intervention requests. 4 NRC at 616. Subsequently, in *Public Service Company of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), CLI-80-10, 11 NRC 438 (1980), the Commission was confronted with a hearing petition challenging a confirmatory enforcement order. It paraphrased its *Pebble Springs* holding and again stated that “the Commission has broad discretion to provide hearings or permit interventions in cases where these avenues of public participation would not be available as a matter of right.” *Id.* at 442. Although the Commission ultimately denied discretionary intervention in *Marble Hill*, it nevertheless fully examined the question and extinguished any notion that consideration of discretionary intervention in enforcement actions was inappropriate. Thus, contrary to the view expressed by the Licensing Board, we think the Commission’s *Marble Hill* and *Pebble Springs* decisions teach that hearing boards are empowered to allow intervention in appropriate licensing and enforcement cases in the absence of a specific and clear withdrawal of authority. Here, as we see it, the Commission’s order does not clearly rescind that authority.¹⁴

III.

Having found no limitation on the Licensing Board’s authority to grant discretionary intervention, we now must decide whether the union petition presents circumstances warranting such a grant. In its *Pebble Springs* decision, the Commission suggested that hearing boards balance the following six factors drawn from the Rules of Practice¹⁵ to determine whether a petitioner should be granted discretionary intervention in an agency proceeding:

(a) Weighing in favor of allowing intervention —

- (1) The extent to which the petitioner’s participation may reasonably be expected to assist in developing a sound record.

¹³ 42 U.S.C. §2239(a).

¹⁴ We find singularly unpersuasive the staff’s argument (Br. at 25) that the “brevity and routine nature” of the referral order, in conjunction with the general agency policy encouraging licensee consent to enforcement orders, evidences the Commission’s intent to divest the Licensing Board of authority to permit discretionary intervention. As discussed above, if any inference properly may be drawn from the brevity and routine nature of the referral order, it is a conclusion opposite to that proffered by the staff. See also note 12, *supra*.

¹⁵ See 10 CFR §2.714(a) and (d).

- (2) The nature and extent of the petitioner's property, financial, or other interest in the proceeding.
- (3) The possible effect of any order which may be entered in the proceeding on the petitioner's interest.
- (b) Weighing against allowing intervention —
 - (4) The availability of other means whereby petitioner's interest will be protected.
 - (5) The extent to which petitioner's interest will be represented by existing parties.
 - (6) The extent to which petitioner's participation will inappropriately broaden or delay the proceeding.

4 NRC at 616.

Although the Licensing Board labeled its interpretation of the Commission's referral order "dispositive" of the intervention question, it nevertheless proceeded to express the view that the Commission's discretionary intervention criteria militated against union participation. 14 NRC at 259-262. We disagree. In the circumstances, denial of the union's hearing request was an abuse of discretion. A proper application and balancing of the criteria for guiding the exercise of discretion favors union intervention.

We shall address each of the six factors *seriatim*. Before doing so, however, two additional points deserve emphasis. First, for the purpose of resolving this appeal from the denial of a hearing petition, we accept as true all material allegations of the union petition.¹⁶ We do this because the propriety of the Licensing Board's ruling must be measured against the record made by the litigants. Here, of course, the record consists primarily of the Director's order and the union's petition. Second, to apply properly each of the Commission's factors, a clear understanding of the allegations comprising the union challenge to the Director's overtime limitation is crucial. Admittedly, the petition is more conclusory and abbreviated than good pleading would suggest. But its gist is plain. It alleges that the overtime proscription placed on the Palisades operators by the confirmatory order is a greater restriction than the agency's otherwise applicable overtime standard¹⁷ and that this greater restriction¹⁸ is not supported by the

¹⁶ *Virginia Electric and Power Company* (North Anna Power Station, Units 1 and 2), ALAB-342, 4 NRC 98, 105 (1976). See *Florida Power & Light Company* (St. Lucie Nuclear Power Station, Unit No. 2), ALAB-420, 6 NRC 8, 13 (1977). Cf. *Gladstone, Realtors v. Bellwood*, 441 U.S. 91, 109 (1979); *Warth v. Seldin*, 422 U.S. 490, 501 (1975).

¹⁷ See note 8, *supra*.

¹⁸ Although the union petition does not quantify the greater overtime limitation placed on the Palisades operators by the confirmatory order, the Licensing Board correctly calculated the maximum difference in permissible overtime under the confirmatory order and the July 31, 1980 criteria (see note 8, *supra*) as 64 hours in any 28-day period. 14 NRC at 263. In

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events set forth in the order or by any other reasonable safety justification. Coupled with this assertion is the union's proffered explanation why the Director's overtime restriction lacks a proper foundation: the operator overtime limitation was proposed, not by the agency, but by the licensee (without notice or consultation with the union) in order to divert the Commission from further enforcement actions against Consumers' Palisades facility.¹⁹

Turning to the first factor for gauging the proper exercise of discretion in ruling on intervention requests — the extent the petitioner's participation would assist in developing the record — the Licensing Board found that the union could provide no assistance. *Id.* at 260. The Board stated (*id.*):

addition, we note that the overtime restrictions in the July 31, 1980 criteria, unlike the restrictions in the confirmatory order applicable only to Palisades operators, apply to the whole group of plant personnel performing safety-related functions. See Attachment to Reply of Utility Workers Union, May 28, 1981.

The July 31, 1980 overtime criteria were superseded by a new Commission policy announced in NUREG-0737, "Clarification of TMI Action Plan Requirements," at 3-6 (November 1980). Even though the NUREG-0737 policy was published several months before the union filed its request for a hearing, the union petition fails to mention the new policy. In any event, this overtime policy applies to those plant personnel performing safety-related functions and provides:

- (1) An individual should not be permitted to work more than 12 hours straight (not including shift turnover time).
- (2) There should be a break of at least 12 hours (which can include shift turnover time) between all work periods.
- (3) An individual should not work more than 72 hours in any 7-day period.
- (4) An individual should not be required to work more than 14 consecutive days without having 2 consecutive days off.

NUREG-0737 at p. 3-7.

On February 18, 1982 the Commission further liberalized its policy on nuclear power plant staff working hours. 47 *Fed. Reg.* 7352 (February 18, 1982). The new policy applies to those plant staff performing safety-related functions and provides that:

- a. An individual should not be permitted to work more than 16 hours straight (excluding shift turnover time).
- b. An individual should not be permitted to work more than 16 hours in any 24-hour period, nor more than 24 hours in any 48-hour period, nor more than 72 hours in any seven day period (all excluding shift turnover time).
- c. A break of at least eight hours should be allowed between work periods (including shift turnover time).
- d. The use of overtime should be considered on an individual basis and not for the entire staff on a shift.

47 *Fed. Reg.* at 7353.

¹⁹ See Union Pet. at 1-2; Reply of Utility Workers Union, May 28, 1981, at 2. Stripped of the union's diplomatic phrasing, it alleges that there is no factual or safety basis for the greater overtime restriction because the Director unwittingly approved the licensee's unfair-labor-practice scheme to limit operator overtime when he accepted Consumers' package of remedies designed to deflect further enforcement actions. Or, stated otherwise, had the Director independently analyzed the greater operator overtime restrictions instead of merely rubber-stamping them as part of a larger package, he would have found no basis or necessity for the limitation.

the Union has not alleged that Palisades has been made any less safe as a result of the restricting of overtime hours. Thus, any "contribution" the Union would make to the record would be to non-safety related issues. To the extent that the Union's "rights" are not related to safety, it is true — and irrelevant — that such rights would not be represented by the NRC because such considerations would be outside the NRC's mandate for protecting the health and safety of the public.

The principal difficulty with the Licensing Board's reasoning is that it overlooks the focus of the record that would be developed in a hearing. It also ignores the very foundation of the union's challenge to the Director's order. As mandated by the Director, the sole litigable issue in any hearing would be whether, on the basis of the operating history recited in sections II and III of the order, the order should be sustained. 46 *Fed. Reg.* at 17690. Hence, the only record to be developed necessarily must be keyed to the events recited in the order and to a consideration of whether they support the order's various provisions. This dovetails precisely with the essence of the union's allegation that the facts set forth in the Director's order show neither the need for the restriction nor any causal relationship between overtime and the recited licensee deficiencies. Rather than focus on the single litigable issue and its relationship to the union's challenge, the Licensing Board mistakenly perceived the safety significance of the union's allegations.²⁰ In our view, the representative of the licensed operators at Palisades is ideally suited to present evidence and otherwise assist in developing the record on the question of whether operator overtime was a causative factor in the events recited in the Director's order. Consequently, this factor weighs in favor of union intervention.

The Licensing Board apparently weighed the second factor against union intervention as well. Its entire consideration of the nature and extent of the petitioner's property, financial or other interest in the proceeding consisted of a single sentence: "Conceding that the Union's interest is economic . . . this interest is not arguably within the 'zone of interests' protected by the Atomic Energy Act." 14 NRC at 260.

The union seeks to protect its members from the potential financial loss resulting from the Director's limitation on the number of overtime hours

²⁰ In reaching its conclusion, the Board fell prey to the staff's sophistic argument that, because the petition did not allege the overtime restriction made the facility less safe, any possible union contribution to the record would be to nonsafety-related issues falling outside the health and safety mandate of the NRC. Although we thought it obvious, a challenge for lack of basis to a putative safety decision of the agency — in this case the Director's overtime limitation on the Palisades operators — is as much within the health and safety mandate of the NRC as a claim that a particular agency decision renders a facility less safe.

the licensed operators at Palisades may work. This interest is concededly economic. As such, the union's interest is squarely within one of the types of interest (*i.e.*, financial) that the Commission's second factor lists as deserving favorable consideration when determining the question of discretionary intervention. See p. 13, *supra*. Furthermore, the operator's pocket-book injury may well prove to be considerable. See note 18, *supra*. Accordingly, the Licensing Board should have weighed this factor positively for union participation. Instead, the Board considered it negatively because it erroneously concluded that, in order to fall within the bounds of the second factor, the union's asserted interest must fall within the zone of interest of the Atomic Energy Act. But the zone of interest inquiry is relevant only to the question of standing and whether a petitioner is entitled to intervene as a matter of right. See note 3, *supra*.²¹ Discretionary intervention, on the other hand, is generally intended to allow participation by those petitioners "who do not meet the tests for intervention as a matter of right." *Pebble Springs, supra*, 4 NRC at 616.

The third factor — the possible effect of any order on petitioner's interest — was also incorrectly weighed by the Board against union intervention. Unlike the normal licensing proceeding where some speculation may be involved in ascertaining the possible effect of future orders on a petitioner's interest, application of the third factor to a confirmatory enforcement order lacks such guesswork. As we have seen, the union seeks to protect the paychecks of its members from what it claims is the Director's baseless limitation on the amount of overtime operators may work. Allegations of such an immediate and substantial injury to the Palisades operators, directly attributable to the Director's overtime restriction, weigh in favor of union intervention. But, in applying this factor, the Licensing Board miscast the union's interests and its challenge to the confirmatory order. It viewed the union challenge as a labor dispute between Consumers and its employees with the Director as a bystander

²¹ As is evident from the result in *Virginia Electric and Power Company* (North Anna Power Station, Units 1 and 2), ALAB-363, 4 NRC 631 (1976), following *deferral*, ALAB-342, 4 NRC 98 (1976), discretionary intervention is not precluded because a petitioner asserts an economic interest outside the zone of interest of the Atomic Energy Act.

No contrary inference should be drawn, as the staff suggests (Br. at 27-28), from our decision in *Detroit Edison Company* (Enrico Fermi Atomic Power Plant, Unit No. 2), ALAB-470, 7 NRC 473, 475 (1978). Our textual remarks accompanying note 2 of ALAB-470 regarding the zone of interest test and the lower Board's treatment of it were intended to be confined to the question of petitioner's standing. They were not aimed at the issue of discretionary intervention — a subject we addressed exclusively in note 2 of that opinion. Therefore, ALAB-470 should not be read as an endorsement of the notion espoused by the Licensing Board in *Fermi*, LBP-78-11, 7 NRC 381, 388 (1978), that economic interests outside the zone of interest of the Atomic Energy Act weigh against discretionary intervention when considering the Commission's second factor.

who should not referee the dispute. 14 NRC at 260. Insofar as the NRC is concerned, however, any labor dispute between the union and licensee is secondary to the union's challenge to the Director's overtime restriction. The Director issued the order and it is the Director who will enforce it. Similarly, only the Director can modify the overtime restriction. Thus, far from being a bystander, the Director is the central player in the union challenge to the overtime restriction.

Balanced against the first three factors on the intervention scale are three others — the availability of other means to protect the petitioner's interest, the extent the petitioner's interest will be represented by existing parties and the extent the petitioner's participation will inappropriately broaden or delay the proceeding. Because it believed another forum was available to hear any union grievance against Consumers, the Licensing Board found the fourth factor disfavored union intervention. *Id.* at 261. The Board then judged the fifth factor irrelevant and concluded that the sixth factor weighed against intervention because union participation would inappropriately broaden the proceeding by leading to a hearing that otherwise would not be held. *Id.* at 262. We disagree with the Board's analysis of these three factors as well.

In considering the fourth factor and concluding that the National Labor Relations Board was the appropriate tribunal to hear the union complaint, the Board perpetuated its mistaken view that the union grievance is against the licensee and that this agency is, in effect, only a bystander. As we previously suggested, the Director's order, not the licensee's action, is the central object of the union challenge. More importantly, only the NRC is suited to adjudge a challenge to the factual support and safety significance of the overtime restriction. No other agency may go behind the Director's order or has the appropriate expertise to review any alleged safety significance of the overtime restriction. Thus, unless and until the Director's order is modified by the NRC, the union cannot obtain complete relief. In the circumstances, we do not think this factor should be credited against union intervention.

Similarly, the fifth factor does not tip the balance against union participation. Although the Board indicated this factor was irrelevant,²² we think it is significant that both existing parties to the challenged order — the licensee and the NRC staff — allegedly oppose the interests of the Palisades operators. According to the union's petition, it was the licensee

²² The Licensing Board concluded that the fifth factor was irrelevant because the "interest of the intervenor is not within the 'zone of interests' protected by the Atomic Energy Act." 14 NRC at 262. As we earlier stated (see pp. 502-503, *supra*), whether a petitioner's asserted interest falls within the zone of interest of the Atomic Energy Act is not germane to determining the appropriateness of discretionary intervention.

that proposed (without prior consultation with the union) the overtime restriction that the Director subsequently adopted. The union's interest, therefore, will not be represented by the existing parties.

Finally, with regard to the sixth factor, the Board noted that union intervention will lead to a hearing that otherwise would not be held since no other petitions challenging the confirmatory order were filed. But, contrary to the Licensing Board's view, we are not persuaded that this fact by itself renders a hearing on the union petition inappropriate. In previous operating license proceedings, we have suggested that "[i]f the petitioner is unequipped to offer anything of importance bearing upon plant operation, it is hard to see what public interest conceivably might be furthered by nonetheless commencing a [discretionary] hearing at his or her behest." *Tennessee Valley Authority* (Watts Bar Nuclear Plant, Units 1 and 2), ALAB-413, 5 NRC 1418, 1422 (1977). The same standard should apply to a petition challenging a confirmatory enforcement order. Here the union meets that test. It seeks to demonstrate that there is neither a safety justification nor a causal relationship between operator overtime and the events relied upon by the Director to support the overtime restriction. Clearly such a union presentation bears directly upon the safe operation of the Palisades plant, even though the union challenge does not conform to the more traditional type of claim that an agency decision falls short of assuring safe operation of a plant. A different result is not warranted because the union asserts that an agency decision goes too far without an adequate factual foundation or safety justification.

Moreover, the particular circumstances of this case suggest an additional reason for permitting the union to challenge the Director's overtime restriction. The Director's order, on its face, does not appear to demonstrate any causal connection between operator overtime and the events recited in sections II and III of the order that purport to support the overtime restriction. Further, the Director's overtime restriction is applicable only to the Palisades licensed operators. It does not apply to any other plant personnel responsible for performing safety-related functions. Yet the single event recited in section III as partial support for the confirmatory order seemingly relates to an electrical repairman, not a licensed operator. This apparent inconsistency, coupled with the Commission's generally applicable overtime policy that applies to all plant personnel performing safety-related functions (see note 18, *supra*), raises sufficient questions as to the scope of the Director's order so as to warrant further inquiry. Permitting the union to intervene should resolve the unexplained aspects of the Director's order.

Accordingly, we think that a proper balancing of the Commission's six factors for guiding the exercise of discretion on intervention requests favors union participation.

The Licensing Board's order of July 31, 1981 is *reversed* and the case is *remanded* for further proceedings consistent with this opinion.

It is so ORDERED.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the Appeal Board

Concurring opinion of Mr. Rosenthal:

For the asserted purpose of furthering the safety of plant operation, the Director of the Office of Inspection and Enforcement has imposed a limitation upon licensed operator overtime at the Palisades facility which is more stringent than the generally applicable one. At bottom, the question here is whether the affected individuals (through their duly recognized collective bargaining agent) should be given the opportunity to be heard on the warrant for the Director's action; *i.e.*, on whether, *inter alia*, there is, in fact, a safety justification for that action. For me, the mere statement of the question suggests its answer. Surely, there must be some adjudicatory forum available in which these operators can challenge as arbitrary an order of an NRC official, issued in purported fulfillment of the responsibilities vested in him by the Atomic Energy Act, which assertedly cuts against their pecuniary interests both immediately and substantially.¹ And what outside forum might possibly be better equipped than one within this Commission itself to pass an informed judgment upon the existence of a relationship between the Director's imposed overtime limitation and the safe operation of this nuclear facility?

In the particular circumstances at hand, I have no quarrel with resting our reversal of the order below on discretionary intervention principles without coming to grips with the seemingly more difficult question of standing to intervene as a matter of right. For the end result is the same irrespective of how the union's ticket of admission might read: the operators will have the chance to demonstrate the validity of their claim that (stated broadly) the requisite link between the prescribed overtime

¹ Even though formally addressed to the licensee, the focus of the order is, of course, upon the employment activities of the operators and it is they who likely will bear its brunt.

limitation and reactor safety is missing.² Whether they will succeed in that endeavor remains, of course, to be seen.

I accordingly join fully in the opinion for the Board. In doing so, however, I am constrained to record my doubt that, had we been compelled to reach it, the standing issue could have been decided against the union simply on the basis that only an economic interest is involved. To be sure, it is now settled that threatened economic injury (e.g., the possibility of increased utility bills) does not confer standing under the Atomic Energy Act to intervene in a construction permit or operating license proceeding concerned with other than antitrust issues. *Portland General Electric Co.* (Pebble Springs Nuclear Plant, Units 1 and 2), CLI-76-27, 4 NRC 610, 614 (1976); *Houston Lighting and Power Co.* (Allens Creek Nuclear Generating Station, Unit 1), ALAB-582, 11 NRC 239, 242 (1980). But this is a quite different type of proceeding and there is at least room for question whether it likewise is controlled by the teachings of those cases.³

² I do not understand the union to assert that, even if such a link does exist, the Director nonetheless lacked the power to impose the limitation in the execution of his statutory duty to protect the public health and safety. See Sections 103b. and 161i. of the Atomic Energy Act of 1954, as amended, 42 USC 2133(b) and 2201(i).

³ Among other things, in sharp contrast to the order which the union seeks an opportunity to attack, the grant of a construction permit or operating license application does not serve affirmatively to impose restrictions upon otherwise lawful activities of any person and the economic impact upon members of the public (e.g., ratepayers) of such licensing action is both incidental and indirect. Although a decision on its operative significance can be left for another day, the very existence of this manifest distinction commends caution in the mechanical transfer of standing principles from one type of proceeding to another.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Alan S. Rosenthal, Chairman
Dr. John H. Buck
Christine N. Kohl

In the Matter of

Docket No. 50-466 CP

**HOUSTON LIGHTING AND POWER
COMPANY**

(Allens Creek Nuclear
Generating Station, Unit 1)

March 31, 1982

The Appeal Board affirms the Licensing Board's denial of an untimely intervention petition (January 12, 1982 memorandum and order (unpublished)), on two independent grounds: (1) the Licensing Board's decision was free of material error and (2) the sole issue the petition raises, that of the applicant's financial qualifications, is not cognizable in this construction permit proceeding under 10 CFR 2.104(b)(1) (*as amended by 47 Fed. Reg. 13750, 13753 (March 31, 1982)*).

RULES OF PRACTICE: UNTIMELY INTERVENTION PETITIONS

A licensing board must consider the five factors set forth in 10 CFR 2.714(a) in deciding whether to accept a late petition to intervene.

**COMMISSION PROCEEDINGS: CASE OR CONTROVERSY
(APPLICABILITY OF
CONSTITUTIONAL PROVISION)**

The constitutional requirement for a "case or controversy" under Article III does not apply to NRC licensing proceedings. *Edlow International Co., CLI-76-6, 3 NRC 563, 569-70 (1976)*.

RULES OF PRACTICE: UNTIMELY INTERVENTION PETITIONS

It is the ability to contribute sound evidence — rather than asserted legal skills — that is of significance in considering a late-filed petition to intervene under 10 CFR 2.714(a).

APPEARANCES

Mr. Robert Alexander, Houston, Texas, petitioner *pro se*.

Messrs. Jack R. Newman and David B. Raskin, Washington, D.C.,
and **J. Gregory Copeland and Scott E. Rozzell**, Houston, Texas,
for the applicant, Houston Lighting and Power Company.

Mr. Richard L. Black for the Nuclear Regulatory Commission
staff.

DECISION

Two years ago, we upheld the Licensing Board's denial of an untimely petition for leave to intervene filed by Robert Alexander in this construction permit proceeding. ALAB-582, 11 NRC 239 (1980). Now before us is Mr. Alexander's appeal under 10 CFR 2.714a from the rejection below of a second, and perforce even more tardy, intervention petition filed by him last November 30.¹ This new petition focuses upon a single issue: the financial qualifications of the applicant to build the proposed Allens Creek facility. As in the instance of the earlier petition, its rejection was founded upon an appraisal of the petitioner's showing on the five specific factors which, by virtue of 10 CFR 2.714(a), are to be considered by a licensing board in deciding whether to accept a late petition.²

The briefing of this appeal was completed on March 5. Less than a week thereafter, on March 11, the Commission amended 10 CFR

¹ January 12, 1982 memorandum and order (unpublished). Because of an inadvertent delay in its service upon Mr. Alexander, the appeal permissibly was filed on February 18.

² Those factors are:

- (i) Good cause, if any, for failure to file on time.
- (ii) The availability of other means whereby the petitioner's interest will be protected.
- (iii) The extent to which the petitioner's participation may reasonably be expected to assist in developing a sound record.
- (iv) The extent to which the petitioner's interest will be represented by existing parties.
- (v) The extent to which the petitioner's participation will broaden the issues or delay the proceeding.

2.104(b)(1) to provide that, in a construction permit proceeding, the notice of hearing will state:

That, if the proceeding is a contested proceeding, the presiding officer will consider the following issues:

• • • • •

- (iii) Whether the applicant is financially qualified to design and construct the proposed facility, *except that this subject shall not be an issue if the applicant is an electric utility seeking a license to construct a production or utilization facility of the type described in §50.21(b) or §50.22; * * **

47 Fed. Reg. 13750, 13753 (March 31, 1982) (emphasis supplied).³ That amendment took immediate effect upon its publication in the Federal Register and, according to the accompanying Statement of Considerations, is to be "applied to ongoing licensing proceedings now pending and to issues or contentions therein * * *". *Id.* at 13750, 13753.

Allens Creek indisputably is a proposed utilization facility of the type described in 10 CFR 50.22. Thus, the amendment to 10 CFR 2.104(b)(1) would appear to foreclose consideration by the Board below of any issue which may have been or might be raised with regard to the applicant's financial qualifications to build that facility.

This being so, the Licensing Board's determination that Mr. Alexander's petition should be turned aside on lateness grounds seemingly has now been stripped of all practical significance. Notwithstanding that consideration, we have elected to pass upon the merits of the ruling below, viewed (as it must be) in the light of the litigability of financial qualifications issues at the time it was made.⁴ Because the licensing boards are all too frequently called upon to decide whether to grant an untimely petition, some further guidance on the subject may be of assistance to them.

For the reasons which follow, we conclude that the Licensing Board did not abuse its discretion in determining that the tardiness of Mr. Alexander's petition dictated its disallowance. Hence, the outcome of the appeal is necessarily the same with or without regard to the Commission's recent total removal of the financial qualifications issue from this proceeding. Accordingly, on two independent bases, Mr. Alexander's challenge to the result below must fail.

1. It is not necessary to revisit here the long and tortuous path traversed by this proceeding since its inception several years ago. For present purposes, it suffices to note (as the Licensing Board stressed) that

³ A corresponding amendment was made to Section VI(c)(1)(iii) of Appendix A to 10 CFR Part 2. 47 Fed. Reg. at 13754.

⁴ "[T]he constitutional requirement for a 'case or controversy' under Article III does not apply to NRC licensing proceedings". *Edlow International Co.*, CLI-76-6, 3 NRC 563, 569-70 (1976).

the present petition — seeking to raise a question respecting the applicant's financial qualifications — surfaced after 84 days of evidentiary hearings and on the virtual eve of the closing of the record (December 9).⁵ In that circumstance, the petitioner's burden on the Section 2.714(a) factors is a heavy one. When recently confronted in another proceeding with an intervention petition filed two weeks after the date for the commencement of the evidentiary hearing had been set, we had this to say:

[Prior to the date of the filing of the untimely petition], the applicants and the staff had every right to assume that both the issues to be litigated and the participants had been established with finality. Simple fairness to them — to say nothing of the public interest requirement that NRC licensing proceedings be conducted in an orderly fashion — demanded that the [Licensing] Board be very chary in allowing one who had slept on its rights to inject itself and new claims into the case as last minute trial preparations were underway.

South Carolina Electric and Gas Co. (Virgil C. Summer Nuclear Station, Unit 1), ALAB-642, 13 NRC 881, 886 (1981), *petition for review pending sub nom. Fairfield United Action v. NRC*, No. 81-2042 (D.C. Cir.). That observation has yet greater force where not merely trial preparation but also the hearing itself has already taken place by the time the belated petition is received.

2. It is in this context that we examine Mr. Alexander's petition. It asserts (at p. 1) that the applicant "has not demonstrated pursuant to 10 CFR 50.33(f) that it possesses or has reasonable assurance of obtaining the funds necessary to cover the costs of constructing and then operating [the Allens Creek facility] in a safe manner * * *". In support of this contention, Mr. Alexander points out (*id.* at pp. 1-2) that the applicant's bond rating has been downgraded by Standard and Poors from AA to A, and asserts that this will increase the cost of applicant's long-term financing for the project. As Mr. Alexander sees it (*id.* at p. 2), this development requires a reassessment of the applicant's "financing plans".

With respect to the five Section 2.714(a) factors (see fn. 2, *supra*), the

⁵ On January 28, 1982, the Licensing Board entered an order which, on motion of one of the existing intervenors, reopened the record for the taking of further evidence on the issue of the applicant's *technical* qualifications. That evidence will be received at a hearing now scheduled to commence on April 12.

Both the applicant and the NRC staff maintain that, in addition to making a sufficient showing on the Section 2.714(a) factors, Mr. Alexander was obliged to satisfy the established criteria for reopening a record. See, e.g., *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-598, 11 NRC 876, 879 (1980); *Kansas Gas & Electric Co.* (Wolf Creek Generating Station, Unit 1), ALAB-462, 7 NRC 320, 338 (1978). The Licensing Board explicitly declined to decide "whether this late-filed petition should be considered as a motion to reopen the record". January 12, 1982 memorandum and order, fn. 2, at p. 3. We likewise find it unnecessary to pass upon that question.

petition maintains (at pp. 2-3) that: (1) Mr. Alexander first learned of Standard and Poors' action from an article appearing in the *Houston Post* on November 26, 1981; (2) he knows of no other means for the protection of his interest; (3) he "is an articulate school teacher fairly knowledgeable with the mechanics of corporate financing and with the dynamics of securities" and plans to offer the testimony of at least one "brokerage house expert" on the implications of the downgrading of the applicant's bond rating; and (4) no existing party to the proceeding has so far "anticipated or addressed" the downgrading. With respect to the final factor, Mr. Alexander concedes (*id.* at p. 3) that his participation might "slightly" broaden the issues and delay the proceeding. He insists, however, that any delay would be relatively small and justified in the interest of developing a sound record.⁶ We consider these arguments *seriatim*.

a. The extent to which applicant's current Standard and Poors' bond rating might be taken as bearing materially upon its financial qualifications to build the Allens Creek facility is problematic. See *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-78-1, 7 NRC 1, 17-23 (1978).⁷ Be that as it may, as the Licensing Board observed,⁸ the reduction of that rating from AA to A cannot be regarded as having first brought the financial qualifications question to the fore. To the contrary, that question long ago had been raised by several of the present intervenors⁹ and then explored in some depth during the evidentiary hearings already concluded.¹⁰ Beyond that, both the applicant and the staff call attention to the fact that, in November 1980 (*i.e.*, a full year before the Standard and Poors' action and the filing of Mr. Alexander's petition), the other principal rating service (Moody's) had likewise downgraded the applicant's bond rating from AA to A.¹¹ Mr. Alexander provided no satisfactory explanation to the Board below why that event had not triggered his intervention endeavor.¹²

⁶ In his brief on the appeal (at pp. 3-4), he urges that, given the supervening reopening of the record on the technical qualifications matter, the delay factor need not be considered by us at all.

⁷ In addition to its discussion of the ingredients of the financial qualifications inquiry then contemplated by NRC regulations, the *Seabrook* decision provided part of the impetus for the Commission's determination to consider eliminating that inquiry from licensing proceedings. See 7 NRC at 17-18; 47 *Fed. Reg.* at 13750.

⁸ January 12, 1982 memorandum and order, at p. 3.

⁹ See Licensing Board March 10, 1980 memorandum and order (unpublished), at pp. 40, 47, 68-69.

¹⁰ See Tr. 16713-16890.

¹¹ The significance of Moody's newly assigned A bond rating to the applicant's financial qualifications was addressed at the hearing. See, *e.g.*, Dean, fol. Tr. 16723, at pp. 5-7; Tr. 16724-31; 16794-95.

¹² Two months after Moody's revised the applicant's bond rating, Mr. Alexander made a limited appearance statement before the Licensing Board (Tr. 2319-26). See 10 CFR 2.715. That statement contained no reference to financial qualifications.

In the totality of these circumstances, we must agree with the Licensing Board that the petition fell far short of establishing good cause for Mr. Alexander's failure to have asserted his financial qualifications contention at a much earlier date (as had other petitioners concerned with that matter). There was simply nothing put before that Board which might have lent credence to the insistence in the petition (at p. 2) that the applicant's revised Standard and Poors' bond rating was, of itself, a sufficiently pivotal development to entitle Mr. Alexander to enter the proceeding as its termination point drew nigh.

b. The papers before us do not illumine whether (and, if so, what) other means might remain available to Mr. Alexander for the protection of his asserted interest in insuring that the applicant possesses the requisite financial qualifications. Because, all things considered, it does not appear to be a crucial factor here, we shall not speculate on the point but, rather, assume that no such alternative means exist.¹³

c. The Licensing Board properly concluded that Mr. Alexander did not demonstrate a likely ability to make a significant contribution to the development of a sound evidentiary record on the financial qualifications issue. No inference of such ability is warranted, let alone compelled, by the unvarnished assertion that "he is an articulate school teacher fairly knowledgeable with the mechanics of corporate financing and with the dynamics of securities". See pp. 511-512, *supra*. Cf. ALAB-582, *supra*, 11 NRC at 241, 244.¹⁴ Nor was his statement of a present purpose to adduce the testimony of an unidentified (and very possibly as yet unobtained) "brokerage house expert" enough to carry the day on that factor. *Summer*, ALAB-642, *supra*, 13 NRC at 893-94.

d. As in the case of the second factor, it is both difficult and unnecessary to make a confident assessment on the fourth factor — that of the representation of Mr. Alexander's interests by existing parties. Manifestly, however, that factor does not weigh heavily in his favor. It may be, as he maintains on the appeal (Br. pp. 2-3), that he had not affirmatively intended to rely upon one or more of the parties to represent his interests. But, given his chosen course of inaction over a protracted period, he can fairly be held to have assumed the risk that none of the participants would

¹³ In discussing this factor, the Licensing Board touched upon the matter of the representation of Mr. Alexander's interest by existing parties. January 12, 1982 memorandum and order, at p. 4. That matter is, however, relevant only with respect to the fourth factor. Insofar as the second factor is concerned, the sole inquiry is into the availability of other fora in which the petitioner himself can undertake the protection of his interests.

¹⁴ Mr. Alexander informs us on appeal (Br. p. 3) that "he is also an articulate law student well-versed in evidentiary matters". But it is the ability to contribute *sound evidence* — rather than asserted legal skills — that is of significance in considering a late-filed petition to intervene.

protect his interests "to the extent he desires" (Br. p. 3). As should have been readily apparent to him, only his own timely intervention could have insured Mr. Alexander that the financial qualifications issue would be litigated to his satisfaction. Cf. *Duke Power Co.* (Cherokee Nuclear Station, Units 1, 2 and 3), ALAB-440, 6 NRC 642, 644-45 (1977).

e. Finally, we cannot adopt Mr. Alexander's suggestion that the question of delay has been effectively mooted by the recent reopening of the record to take a limited amount of additional evidence next month on the technical qualifications issue (see fn. 6, *supra*). We have been provided no basis for judging how much time might be necessary for pre-trial preparation (including possible discovery) in connection with a relitigation of the financial qualifications issue.¹⁵ The potential for delay attendant upon a grant of the petition at hand thus cannot be discounted.

In sum, two weighty factors (the first and third enumerated in 10 CFR 2.714(a)) militate strongly against allowing this extremely late intervention attempt, and a third equally significant factor (that of delay) at the very least points in the same direction. And Mr. Alexander's lack of diligence in protecting his own interest precludes giving the other two factors controlling effect. This being so, the Licensing Board manifestly acted within the bounds of its discretion in denying the petition.

Accordingly, we *affirm* the result below on the independent grounds that (1) the Licensing Board's assessment of the untimeliness of Mr. Alexander's petition was free of material error; and (2) the sole issue raised by the petition is no longer cognizable in this proceeding.

It is so ordered.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the Appeal Board

¹⁵ Once again, this analysis does not take account of the recent Commission removal of that issue from licensing proceedings but, rather, is based upon the situation obtaining when the Licensing Board ruled on the petition in January. See p. 510, *supra*.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Louis J. Carter, Chairman
Dr. Oscar H. Paris
Frederick J. Shon

In the Matter of

Docket Nos. 50-247-SP
50-286-SP

**CONSOLIDATED EDISON
COMPANY OF NEW YORK**
(Indian Point, Unit No. 2)

**POWER AUTHORITY OF THE
STATE OF NEW YORK**
(Indian Point, Unit No. 3)

March 1, 1982

The Licensing Board grants intervention petitioner's motion to permit petitioner's representatives to observe the emergency planning exercise scheduled for the Indian Point facility.

JURISDICTION OF LICENSING BOARD: SPECIAL PROCEEDING

Where the granting of petitioner's motion would likely result in refinement and focusing of contentions relating to emergency planning, the authority of the Licensing Board to entertain the motion was established by the provisions of 10 CFR 2.718(e) which describes the powers of presiding officers generally, or by the Commission memorandum and order that constituted the Board and directed it to investigate, *inter alia*, questions related to emergency planning.

RULES OF PRACTICE: TIMING OF DISCOVERY

Given the Licensing Board's mandate from the Commission to investigate emergency planning issues related to the Indian Point facility,

and the fact that the emergency planning exercises that were the subject of petitioner's motion were scheduled to take place within two (2) days, the Licensing Board was not required to adhere strictly to the provisions of the Rules of Practice governing the timing of discovery when to do so would frustrate the announced purpose of the hearing and where no party would be seriously disadvantaged by expediting the action. Accordingly, the Licensing Board would entertain petitioner's motion though petitioner had not yet been admitted as a party, no contentions had yet been admitted in the proceeding, and the 30-day period for response to the motion had not elapsed.

RULES OF PRACTICE: DISCOVERY, PROTECTIVE ORDER

Although licensees did not allege facts sufficient to support the grant to them of a protective order, the Board would not permit an "unbridled inspection" of licensees' plant, and would impose conditions upon petitioner's observation of the emergency planning exercises sufficient to keep the operation free of anything that might constitute interference.

MEMORANDUM AND ORDER

(Granting UCS/NYPIRG Motion for Discovery and Staff Motion for Approval of Stipulation)

The Union of Concerned Scientists and New York Public Interest Research Group (UCS/NYPIRG) in a motion dated February 9, 1982, requested this Board to order the Licensees, the State of New York, and the Counties of Westchester, Rockland, Putnam, and Orange to permit representatives of organizations which have filed petitions to intervene in this proceeding to observe the emergency planning exercise scheduled for the Indian Point facility on March 3, 1982. In a telephone conversation on February 23, the NRC Staff advised us that a meeting to discuss a stipulation¹ would be held in New York on February 24 and that the Staff would be filing its response to UCS/NYPIRG's motion on February 25. Attached to Staff's response, which was filed after close of business on February 25, were unsigned stipulations (1) between the Staff, the Federal Emergency Management Agency (FEMA), and the petitioners, and (2) between Westchester County and petitioners. By telephone message on February 26, Rockland County advised that it would join the stipulation of

¹ The parties to the Stipulation were UCS/NYPIRG, Westchester County, and FEMA, but not the Licensees.

Westchester County. Finally, along with Staff's filing on January 25, we received Licensees' answer, dated February 24, opposing the UCS/NYPIRG motion.

We shall approve, in a later order, the aforesaid stipulations upon receiving signed copies, provided the signed copies do not differ in substance from the copies we now have. We grant herein a part of UCS/NYPIRG's motion as it applies to entry upon the property and facilities under the control of the Licensees. We turn now to a consideration of the Licensees' objections to the motion.

THE OBJECTION THAT THE REQUESTED RELIEF IS BEYOND THE BOARD'S JURISDICTION

Licensees argue that this Board lacks jurisdiction to entertain UCS/NYPIRG's motion on two grounds:

1. ". . . [A]n Atomic Safety and Licensing Board possesses only the jurisdiction delegated to it by the Commission."
2. We lack jurisdiction with respect to the emergency planning exercise because it "is simply one of hundreds of required functions performed by the licensees in the course of their normal operations, under the jurisdiction of the Commission and Staff." Pp. 5-6.

Licensees cite *Northeast Nuclear Energy Co.* (Montague Nuclear Power Station, Units 1 and 2), 1 NRC 436 (1975), in which a Board held that it lacked the authority to order the staff and applicant to hold discussions pursuant to 10 CFR §2.102 near the site or, alternatively, to provide intervenor with verbatim transcripts of such meetings. That Board held that its supervisory authority over staff actions derived from Sections 2.104 and 2.718 and that it lacked authority to direct the staff in the conduct of its business under Section 2.102.

To begin with, we do not view the emergency preparedness exercise which is to be conducted in the vicinity of the Indian Point plants on March 3, 1982, and which will involve not only the Licensees and the NRC Staff, but also the Federal Emergency Preparedness Agency, the State of New York, the Counties of Westchester, Rockland, and apparently Putnam and Orange, plus various townships, municipalities, and other public institutions and organizations, to be the same as the routine discussions carried out between staff and applicants under Section 2.102.² Indeed, the success or failure of the emergency preparedness program will depend, to no small degree, on how well the general public is informed and

² Section 2.102 is clearly directed to how the Staff carries out administrative duties in reviewing applications. Nothing such as that is here involved.

responds. The matter can hardly be construed to be a matter merely between the Licensees and the Staff or FEMA.

We believe that our authority to entertain the UCS/NYPIRG motion is clearly established by 10 CFR §2.718(e) which describes our powers generally. But even were that not so, the Commission said, in its Memorandum and Order dated September 18, 1981, that this Board would not be bound by the provisions of 10 CFR Part 2 with regard to the admission and formulation of contentions which were directed toward the issues raised by the Commission's questions on pages 9 and 10 of its Memorandum and Order dated January 8, 1981. Revised fn.4, p. 2. Since questions 3 and 4 on page 10 relate to emergency planning, and since granting the UCS/NYPIRG motion will likely result in refinement and focusing of contentions relating to emergency planning, we believe that we are also acting under the explicit authority given this Board by the Commission. Further, it would certainly seem sensible that since the Board has the power to cause the deposition of a control room employee to be taken, it likewise has the power to permit the silent observation of that employee's action during a planned exercise.

THE OBJECTION THAT THE MOTION IS PREMATURE

Licensees object to the motion as premature on three grounds:

1. UCS/NYPIRG is not yet admitted as a party.
2. No contentions have been admitted to serve as a basis for discovery.
3. 10 CFR §2.741 directs that a party first seek discovery of this sort from another party. Only after a 30-day opportunity to respond has elapsed can the party seeking discovery apply to the Board for relief.

As to the last point, were this a casually-paced proceeding we would be inclined to demand strict adherence to such procedural niceties. But the exigencies of the present case do not permit that. Clearly a 30-day response period is impossible. The time set for the proposed drill is only a few days off and one must strike while the iron is hot. To allow procedural delicacy to frustrate the announced purpose of this hearing would be foolish, the more so where, as here, no party is seriously disadvantaged by expediting the action.

As to the specific objection that contentions have not yet been admitted, it seems to the Board that the purpose of permitting discovery only after admitting contentions is to assure there will be no time and effort wasted in irrelevant discovery. Here, unlike in other cases, many of the issues have been fixed in advance by the Commission itself. Questions 3 and 4 at page

10 of the Commission's Order of January 8, 1981, directly concern emergency planning. The discovery here sought is thus clearly relevant to a matter before this Board. And it is clear that UCS, at least, whose petition triggered the Commission's concerns in this case, is likely to be granted full party status.

In addition to explicitly delineating emergency planning in its questions on page 10, the Commission provided further indication of the importance it attached to this subject. It said:

The Commission is concerned with both the total risk to the persons and property posed by the Indian Point plants and the risk to individuals living in the vicinity of the Indian Point site, *including that resulting from the difficulty of evacuation in an emergency.* (Emphasis added.)

and

The Commission is also interested in the current state of emergency planning in the vicinity of the Indian Point site and in future improvements in that planning as well as in resolving the specific contentions in the UCS Petition to the effect that some of our regulations are not met in one or both units. (Emphasis added.) P. 8.

Given the clear mandate we have with respect to investigating emergency planning, the idea that discovery of the type sought could be lost effort in the case at bar is clearly untenable.

THE OBJECTION THAT UCS/NYPIRG SEEKS DISCOVERY AGAINST NON-PARTIES

Licensees object that UCS/NYPIRG seeks discovery against non-parties, citing *Santa Fe v. Potashnik*, 83 F.R.D. 299 (E.D. La. 1979) and *Humphries v. Pennsylvania Railroad Co.*, 14 F.R.D. 177 (N.D. Ohio 1953). The short answer here is that we shall not grant UCS/NYPIRG's motion with respect to Putnam and Orange Counties. However, unlike the facts in the cited cases, it is clear that Licensees are already admitted parties. Further, the three agencies of the State are petitioners as interested States in this case. If those entities were to adopt such a hair-splitting defense against cooperation with this investigation as to refuse to allow observation on the ground that they were not, strictly speaking, parties, we would be ill-disposed in our discretion to permit their further participation. We shall expect these State agencies to cooperate to the same degree as the Licensees. We do not intend to usurp any jurisdiction of the State in this matter; we mean only to control the proceeding presently before us.

THE OBJECTION THAT THERE IS NO PROPER BASIS FOR THE REQUEST

Licensee alleges that the purpose of 10 CFR §2.741 would be distorted were we to permit this discovery, citing *Belcher v. Bassett Furniture*, 588 F. 904 (4th Cir. 1978). The cited portion disapproves an "unbridled inspection" of the defendants' plants. Here, of course, no such broad permission is at issue. UCS/NYPIRG simply wishes to observe a specific limited operation, one which will occur only rarely, has obvious relevance to the case, and will simultaneously be observed by members of the Staff and FEMA.

It is also clear that, contrary to Licensees' assertion at page 17 of their motion, denial of the motion would prejudice UCS/NYPIRG's case. The opportunity to watch an actual drill in progress might not arise again in the course of this chronologically limited inquiry.³

We acknowledge, as Licensees note, that the principal purpose of UCS/NYPIRG's attendance upon the scene may be to "disparage" what they see. Indeed, the heart of the adversary system is the gathering of deliberately tendentious views. We would expect their perspective to be that of the jaundiced eye, but we do not see that as an argument against permitting observation, nor should we put blinders on that eye, however jaundiced.

We do, however, strongly sympathize with the Licensees' desire to keep this critical operation free of anything that might constitute interference.⁴ We shall therefore impose upon UCS/NYPIRG's observers at positions 1, 2, and 3 (page 4 of UCS/NYPIRG Motion), the following conditions:

1. The observers may watch and listen only from a position that does not interfere with the personnel needed for the test. (Where visual and auditory observation can be accomplished from outside the actual control room, that can be required by Licensees, FEMA, or Staff.)
2. The observers will not ask questions, make any loud remarks, record other than by taking notes, nor take any photographs while the test is in progress.

³ The Board has only until September of 1982 to complete its part of the investigation.

⁴ Licensees make general references to a "burden" on them (Licensees' Answer at page 17) and to alleged circumvention of procedural safeguards (at page 18). Licensees, however, do not aver or allege facts sufficient to support the grant to them of a protective order under Section 2.740(c). That rule would permit protection "from annoyance, embarrassment, oppression, or undue burden or expense." Absent such allegation there appears to be no support for an interference call.

3. The observers are not, of course, exempted from the customarily required security searches and practices normally attendant on entering these areas.

Needless to say, Licensees' apprehension lest every petitioner and his/her lawyer be allowed to attend is also reasonable. Two observers means *only* two individuals.

RULING

We therefore rule as follows on the UCS/NYPIRG Motion at pages 4-5 with regard to the presence of observers at the numbered positions:

Positions 1-3. UCS/NYPIRG may station two observers at each of the three locations, positioning them where they can see and hear, but cannot interfere with, the operation. In particular:

1. At the option of the Licensees, the observers may be required to stay behind some line or barrier in a manner which permits visual and auditory observation of the general area.
2. The observers shall not ask questions, make any loud remarks, record other than by taking notes, nor take photographs while the test is in progress.
3. The observers are not exempt from the customarily required security searches and procedures normally attendant upon entry into the area.

Position 4. We expect the State of New York to be as cooperative in this matter as the Licensees by allowing observers under conditions similar to those set forth for the Licensees. We may take the State's cooperation into consideration when ruling on the participation of the several State agencies who have petitioned to enter this case.

Position 5. We do not know what agency is in charge of the named Center, nor have UCS/NYPIRG seen fit to enlighten us. Under the circumstances we cannot rule unless Position 5 is under the aegis of the State; if it is under State supervision, then the ruling given with respect to Position 4 shall apply to Position 5.

Positions 6 and 7. We understand that the unsigned stipulations mentioned above have been arrived at with the two counties involved.

Positions 8 and 9. We would appreciate cooperation from Putnam and Orange Counties along the lines set forth for the Licensees.

Positions 10-15. We understand that the unsigned stipulation, mentioned above, will permit the desired observation.

Page 5, items 1-5. We understand that the unsigned stipulation, mentioned above, will provide for UCS/NYPIRG representation as desired.

ORDER

Upon consideration of the foregoing and of the entire record in this matter, it is this first day of March 1982,

ORDERED

1. That Consolidated Edison Company of New York and the Power Authority of the State of New York shall permit two representatives appointed by UCS/NYPIRG to observe the emergency planning exercises at each of the sites under Licensees' control, subject to the conditions we have outlined herein.

2. Observers shall comply with the conditions which we have imposed herein.

3. The State of New York should afford the same opportunity to UCS/NYPIRG observers at the sites it controls.

4. The motion for approval of stipulations will be granted when signed copies of the stipulations are filed, provided that the signed copies do not differ substantially from the unsigned copies.

ATOMIC SAFETY AND LICENSING BOARD

Oscar H. Paris
ADMINISTRATIVE JUDGE

Frederick J. Shon
ADMINISTRATIVE JUDGE

Louis J. Carter, Chairman
ADMINISTRATIVE JUDGE

Bethesda, Maryland
March 1, 1982

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Louis J. Carter, Chairman
Dr. Oscar H. Paris
Frederick J. Shon

In the Matter of

**Docket Nos. 50-247-SP
50-286-SP**

**CONSOLIDATED EDISON
COMPANY OF NEW YORK
(Indian Point, Unit No. 2)**

**POWER AUTHORITY OF THE
STATE OF NEW YORK
(Indian Point, Unit No. 3)**

March 2, 1982

The Licensing Board denies licensees' request for a stay and for certification to the Commission of the Board's order permitting intervention petitioner's representatives to observe emergency planning exercises at licensees' plant, but grants licensees' request for referral of the order to the Commission under the discretionary interlocutory appeal provisions of the Rules of Practice.

RULES OF PRACTICE: DISCOVERY

Where it was unmistakably clear that the adequacy of emergency planning for the Indian Point facility was an issue to be fully investigated in the proceeding, and where, in the opinion of the Board, the observations of potential intervenors as to emergency planning exercises scheduled for the next day would be useful to the Board in its deliberations, the Board would deny licensees' request for stay and certification to the Commission of its order permitting such observations, since to grant the request would render the issue moot.

RULES OF PRACTICE: DISCRETIONARY INTERLOCUTORY APPEALS

Where the emergency planning exercises that were the subject of the Board's order permitting observation by representatives of intervention petitioner were scheduled to take place the next day, the Board would grant licensees' request for referral of the order to the Commission pursuant to the discretionary interlocutory appeals provisions of the Rules of Practice (10 CFR 2.730(f)) because of the need for a prompt decision.

MEMORANDUM AND ORDER (Denying in Part and Granting in Part Licensees' Application for a Stay, Certification, and Referral)

This Board issued a Memorandum and Order on March 1, 1982, granting in part a motion by the joint petitioners, Union of Concerned Scientists and New York Public Interest Research Group (UCS/NYPIRG) to require the Licensees to allow representatives from the organizations which have filed petitions to intervene in this proceeding to observe the emergency planning exercises which are scheduled to take place at Indian Point on March 3, 1982.¹ On March 1, 1982, the Licensees filed "Licensees' Application for Certification and Referral to the Commission and for a Stay of the Board's Ruling on the UCS/NYPIRG Motion for Discovery and to Permit Entry upon Land in Control of the Licensees and Interested States" (Licensees' Application).

A conference call was held on the afternoon of March 1, 1981, between the members of the Board and the lawyers representing the Licensees, the NRC Staff, and UCS/NYPIRG. During the conference argument on Licensees' Application was presented by all participating parties. No request was made by any party for an opportunity to make any further filing.

The Licensees allege irreparable damage if UCS/NYPIRG observers are present in the control room during the emergency procedures exercise. No firm evidence of damage was adduced, however, other than a concern

¹ UCS/NYPIRG also requested that the Board order that it be allowed to place observers at the state and county operated facilities that will be involved in the exercise. By stipulation between UCS/NYPIRG, the Counties of Westchester and Rockland, the Federal Emergency Management Agency, and the NRC Staff, the petitioners will be allowed to place observers at the County facilities. No response to UCS/NYPIRG's motion has been received from the State of New York; therefore the Board has asked the State to also allow observers at its facilities.

for the effect of what Licensees perceive to be overcrowding the control room. The control room is alleged to have about 600 square feet of floor space in which observers will be standing during the exercise. In addition to the 7 persons who will be present operating the reactor (Unit 3), there will be present 9 drill participants, 5 observers for the Licensee, 3 for the NRC Staff, the 2 UCS/NYPIRG observers, and 2 Licensees' representatives (one litigator and one security person) assigned to accompany the UCS/NYPIRG observers. Licensees could provide no information as to the number of persons that had been accommodated in the control room during previous exercises. It was pointed out, however, that the impending exercise will be the first to involve off-site activities.

Concern was expressed by the Licensees about the fact that UCS/NYPIRG's attorney had not identified the individuals it wished to send as observers to the site. UCS/NYPIRG's attorney identified them as Mr. Robert Pollard and Mr. Steven Sholley, both of UCS.

Nothing submitted in Licensees' Application or in the oral argument during the conference call persuades this Board that there is any serious cause for concern because UCS/NYPIRG observers will be present in the control room during the emergency planning exercise. Licensee's argument that UCS/NYPIRG has not yet been admitted as a party or that contentions relating to emergency planning have not yet been accepted is not persuasive. UCS was responsible for the original petition which prompted, in part, the Commission's initiating this proceeding; it is virtually assured that UCS/NYPIRG is one of the petitioners that will become full party to the proceeding. Finally, it is unmistakably clear that the adequacy of the emergency planning for the Indian Point facility is an issue which must be fully investigated in this proceeding. It is the opinion of this Board that the observations of the potential intervenors, in addition to those of the Licensees and the NRC Staff, will be of value to the Board in its deliberations.

We are denying the requests for certification and a stay because to grant them would moot the question and deny this proceeding any possible benefit of UCS/NYPIRG's observations of the exercise. We are referring the matter to the Commission because the Licensees are bringing the matter directly to the Commission's attention, and time is short.

ORDER

Upon consideration of the foregoing and the entire record in this matter, it is this 2nd day of March, 1982,

ORDERED

1. That the application for a stay of our Order dated March 1, 1982,

granting the motion of UCS/NYPIRG to place observers at the Indian Point site, is *denied*.

2. That Licensees' application for certification of our March 1, 1982, order to the Commission, pursuant to 10 CFR §2.718(i) and §2.788, is *denied*.

3. That Licensees' request for referral of our Order dated March 1, 1982, to the Commission pursuant to 10 CFR §2.730(f) is *granted*.

**ATOMIC SAFETY AND
LICENSING BOARD**

**Oscar H. Paris
ADMINISTRATIVE JUDGE**

**Frederick J. Shon
ADMINISTRATIVE JUDGE**

**Louis J. Carter, Chairman
ADMINISTRATIVE JUDGE**

Bethesda, Maryland
March 2, 1982

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Peter B. Bloch, Chairman
Dr. Jerry R. Kline
Mr. Frederick J. Shon

In the Matter of

Docket Nos. 50-440-OL
50-441-OL

**CLEVELAND ELECTRIC
ILLUMINATING COMPANY, et al.**
(Perry Nuclear Power Plant,
Units 1 & 2)

March 2, 1982

The Licensing Board denies intervenor's request for a stay of proceedings, treating the request as a motion for continuance.

RULES OF PRACTICE: EXTENSIONS OF TIME

While an allegation of serious construction deficiencies might properly be the subject of a discovery request, it does not provide a basis for continuing the proceeding.

LICENSING DECISIONS: SCOPE

It is the responsibility of the Licensing Board to adjudicate contentions raised by the parties and important safety and environmental issues raised by the Board *sua sponte*, pursuant to Commission regulations. The Board will not decide whether construction complies with all legal requirements unless that issue is raised by an admitted contention or incorporated within a *sua sponte* issue.

MEMORANDUM AND ORDER
(Concerning Motion for a Continuance)

On February 24, 1982, Sunflower Alliance, Inc., et al. (Sunflower) requested a stay of these proceedings. Because there is no need to issue a stay to ourselves in order to stop these proceedings, we interpret the motion for a stay as a motion for a continuance.

We find this motion to be entirely without merit. Sunflower is alleging serious construction deficiencies, including the presence in "the bioshield" of large concrete voids. The allegation might properly be the subject of a discovery request. However, it does not provide a basis for continuing the proceeding. See, LBP-82-10, *Wisconsin Electric Power Company* (Point Beach Nuclear Plant, Units 1 and 2), 15 NRC 341, 345-46 (1982).

Sunflower already has an admitted contention concerning construction deficiencies and it has moved to have that contention enlarged. It has raised this argument in the context of that motion. Reply Brief of February 26, 1982, at 2.

Sunflower's concern is not yet ripe. There is adequate opportunity under existing rules of procedure for it to raise quality assurance issues in a timely fashion. An operating license will not be granted until such issues have been appropriately resolved.

We are troubled by an aspect of the Sunflower filing. On page 2, Sunflower states that,

This Board may not license Applicant until this Board is satisfied that the construction complies with all legal requirements This Board is sworn to certify that the construction at Perry is acceptable.

This statement is incorrect in detail and in generality. Our responsibility is to uphold the laws and regulations of the Commission and to decide our cases fairly. We certainly are not sworn to certify that construction is either acceptable or unacceptable. In addition, our responsibility is to adjudicate contentions raised by the parties plus important safety and environmental issues which we raise *sua sponte*, pursuant to Commission regulations. We will not decide whether "construction complies with all legal requirements" unless that issue is raised by an admitted contention or incorporated within a *sua sponte* issue. At the present time, only a limited quality assurance contention has been admitted. Should we grant the motion to enlarge the contention, our obligation will come closer to that which Sunflower describes but there may still not be a precise congruity.

See the opening statement at the Special Prehearing Conference, Tr. 1 ff., for a further discussion of our obligations.

ORDERED:

That the Motion to Stay Proceedings filed by Sunflower Alliance, Inc., et al., on February 24, 1982, is denied.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Andrew C. Goodhope, Chairman
Dr. Linda W. Little
Dr. Forrest J. Remick

In the Matter of

**Docket Nos. 70-1308
& 72-1 SP.**

GENERAL ELECTRIC COMPANY
**(GE Morris Operation Spent
Fuel Storage Facility)**

March 2, 1982

The Licensing Board grants Applicant's motion for summary disposition of all remaining contentions.

RULES OF PRACTICE: SUMMARY DISPOSITION

In order to grant a motion for summary disposition, the record before the Board must demonstrate clearly that there is no possibility that a litigable issue of fact exists. Any doubt as to whether the parties should have been permitted or required to proceed further would have required a denial of the motion.

DECISION AND ORDER
(Granting Motion For Summary Disposition)

This is a license renewal proceeding in which the Applicant, General Electric Company (GE), seeks a 20-year extension of its existing license to store spent (irradiated) fuel at its Morris, Illinois facility. After the Board granted petitions to intervene and contentions were formulated, extensive discovery was held by all parties. At the conclusion of this discovery, the Applicant filed a motion for summary disposition of all contentions of the

only remaining intervenor in this matter, State of Illinois (Intervenor).¹ With its motion Applicant filed 74 statements of material fact about which it contends there are not genuine issues to be heard by the Board.²

In its response Intervenor opposed summary disposition of any of the contentions.³ Intervenor in its statement moved to strike a substantial number of Applicant's statements of material fact on the grounds that some are not properly supported as required by 10 CFR §2.749, or that some are not completely supported by proper evidence, or that some are premature, or that one, 34, is not a fact but a conclusion of law. The only further support which Intervenor proffers⁴ in support of its motion to strike is in its response in opposition to the motion. Each of the contentions will be treated hereafter seriatim. This will include a discussion of Applicant's Staff's and Intervenor's positions on each contention.

The Intervenor also made no response to a number of Applicant's statements of material fact. The only statement of material fact asserted by Intervenor is "Morris could be abandoned because of an accident at Dresden" (Minor affidavit). This statement is treated hereafter in the Board's ruling on Contention 4.

The NRC Staff in its answer in support of Applicant's motion⁴ supports the Applicant's motion and recommends that the Board dismiss all contentions since there are no genuine issues of material fact to be heard. The Applicant, in addition on October 2, 1981, filed a reply to Intervenor's Statement and Response.

10 CFR §2.749 specifically provides that statements of material facts required to be served by the moving party will be deemed to be admitted unless controverted by the statement required to be served by the opposing party. Intervenor's responses set out only one statement of material fact and briefly move to strike most of the Applicant's statement of material facts as not supported or as premature and make no response to an additional number. Whether this approach complies with the rule is at least questionable, however, the Board has reviewed Applicant's statement of material facts and finds that they are properly and fully supported by substantial and competent evidence and also finds that the Intervenor's claims to the contrary are without merit. A discussion of the pertinent

¹ General Electric Company's Motion for Summary Disposition and Memorandum in Support Thereof (Applicant's Motion) dated August 28, 1981.

² Statement of Material Facts as to Which There is no Genuine Issue to be Heard (Applicant's Statement).

³ Response to General Electric's Statement of Material Facts (Intervenor's Statement) and Illinois' Response in Opposition to Applicant's Motion for Summary Disposition (Intervenor's Response), dated September 22, 1981.

⁴ NRC Staff Answer in Support Total of Applicant's Motion for Summary Disposition (Staff Answer) dated September 22, 1981.

statement of material facts and Intervenor's contrary arguments are contained in the Board's rulings on each contention. The Board adopts Applicant's statement of material facts as its own. This statement of material facts, as edited, appears at the end of this decision as Appendix A.

The Board is issuing this Order pursuant to its authority granted in 10 CFR §2.749. We have kept in mind that in order to grant a motion for summary disposition, the record before us must demonstrate clearly that there is no possibility that there exists a litigable issue of fact. Had we had any doubt or felt that parties should be permitted or required to proceed further than the evidentiary showing before us, we would have denied the motion for summary disposition. This is true in our ruling adopting Applicant's statements of material facts and rulings on the contentions.

RULINGS ON CONTENTIONS

Contention 1 alleges:

The consolidated Safety Analysis Report (CSAR) does not adequately describe the following:

- (a) The consequences of simultaneous accidental radioactive releases from the Dresden Nuclear Power Station and the Morris Spent Fuel Storage Facility;
- (b) The risks and consequences of the release of radioactive elements in excess of Part 20 regulations as a result of any of the following accidental occurrences at the Morris facility: (i) the consequences of an accident caused by a tornado impelled missile; (ii) a loss of coolant accident, alone and in conjunction with an accident which has caused a rift in the building structure; (iii) earthquake related accidents; (iv) sabotage related accidents not analyzed in NEDM-20682.⁵

Applicant's contended material facts 8-12, previously adopted by the Board, are applicable to Contention 1(a). These contended material facts are properly supported by reference to applicable regulations, filings in this proceeding, depositions and an affidavit.⁶

The Intervenor relies primarily on an accompanying affidavit⁷ to establish genuine issues of material facts. This affidavit addresses the population

⁵ Contention 1(b), as originally admitted, contained further subparts (v) through (ix). These subparts were dismissed (Prehearing Conference Order Dismissing Certain Contentions and Setting Dates for Filing Motions for Summary Disposition dated August 21, 1981).

⁶ Affidavit of Eugene E. Voiland (Voiland) at §§2, 3. The Voiland Affidavit is Appendix B to Applicant's Motion.

⁷ Affidavit of Gregory C. Minor Concerning Issues Related to Morris Spent Fuel Storage (Minor) attached to Intervenor's Response as Exhibit A.

density surrounding the site, pointing out that accidents at either the Dresden or Morris site have the potential to impact a very large population and warrant special precautions. The affidavit also indicates that "It is conceivable that a Dresden accident could release radioactive material that would contaminate the Morris operation site (only 0.7 miles away) and limit access of personnel to perform necessary maintenance and repair. Further, such an accident at Dresden could result from an initiating event such as a tornado, earthquake, blackout, or sabotage, which would impact the Morris Operation, perhaps even causing accidents and releases there as well. The CSAR has only considered such influences and interactions within the limited range of DBA releases."

In response to Applicant's interrogatories⁸ questioning the bases for Contention 1(a), Intervenor points to the MHB Report.⁹

The Staff indicates that Contention 1(a) raises no genuine issue of material fact. The Staff believes that the material facts alleged by the Applicant are correct.¹⁰ Further, the Staff supports Applicant's motion that summary disposition on this contention should be granted.

This contention alleges that the CSAR¹¹ is deficient because it does not "adequately describe" the accidents specified in subparts (a) and (b) of the Contention. The regulations in 10 CFR Part 72, "Licensing Requirements for the Storage of Spent Fuel In An Independent Spent Fuel Storage Installation" do not require that the Applicant's CSAR consider particular accidents. 10 CFR §72.15(a) provides that each application for a license under Part 72 shall include a Safety Analysis Report (SAR) describing the proposed Independent Spent Fuel Storage Installation (ISFSI) for the storage of spent fuel, including how the ISFSI will be operated. According to 10 CFR §72.15(a)(13), the SAR shall include:

"An analysis of the potential dose or dose commitment to an individual outside the controlled area from accidents or natural phenomena events that result in the release of radioactive material

⁸ General Electric Interrogatories Propounded to the Intervenor State of Illinois dated July 15, 1980.

⁹ Technical Review of Risk Due to Expansion of the Morris Operation Spent Nuclear Fuel Storage by MHB Technical Associates dated February 1979 (MHB Report). This report does not relate to the licensing action consideration in this current proceeding. It relates to a suspended licensing action concerning previous plans by the Applicant to expand the storage capacity of the Morris Operation. The MHB Report states at page 1-1 that the report "is a study assessing the extent to which the risk to the health and safety of the public is impacted by expansion of MO (Morris Operation)".

¹⁰ Affidavit of A. Thomas Clark (Clark) at p. 2 annexed to NRC Staff Answer.

¹¹ Consolidated Safety Analysis Report for Morris Operation (CSAR), NEDO-21326C, January 1979. Where applicable, Attachment G to Applicant's amended application for license renewal under 10 CFR Part 72, dated January 12, 1981, and supplements contained information superseding that in the CSAR (Attachment G).

to the environment or direct radiation from the ISFSI. The calculations of individual dose or dose commitment shall be performed for direct exposure, inhalation, and ingestion occurring as a result of the postulated design basis event."

10 CFR §72.72(e), "Proximity of Sites," states that:

"An ISFSI located near other nuclear facilities shall be designed and operated to ensure that the cumulative effects of their combined operations will not constitute an unreasonable risk to the health and safety of the public."

The Dresden Nuclear Power Station (DNPS) is located about one-half mile north northeast of the Morris Operation.¹² Section 3.3.1 of the CSAR, "Nearby Nuclear Facilities," considers the combined radiological impacts from the Morris Operation and the DNPS and concludes that such impacts are within the requirements of 10 CFR §72.67.¹³

The CSAR considers various postulated accidents and estimates of the quantity of radioactive materials released and projected, including the most severe postulated accidents at DNPS and Morris.¹⁴

The Staff considered the combined operation of DNPS and Morris in the SER, §3.7, "Proximity of Sites" and §7.8 "Interaction of the Dresden Reactors with the Morris Operation." The estimated doses from the Morris Operation, under normal conditions,¹⁵ do not make a significant contribution to the 25 mrem whole body dose limit set forth in 40 CFR Part 190 by the Environmental Protection Agency (EPA) for any member of the public.¹⁶

An accidental release of radioactivity from DNPS would not cause an additional release of radioactivity from the Morris Operation. If there were simultaneous accidents at Dresden and the Morris Operation, the maxi-

¹² Safety Evaluation Report (SER), NUREG-0709, July 1981, §7.8; Clark at 4.

¹³ Clark at 4; 10 CFR §72.67 provides that:

"Criteria for radioactive materials in effluents and direct radiation from an ISFSI.

- (a) During normal operations and anticipated occurrences, the annual dose equivalent to any real individual who is located beyond the controlled area shall not exceed 25 mrem to the whole body, 75 mrem to the thyroid and 25 mrem to any other organ as a result of exposure to: (1) planned discharges of radioactive materials, radon and its daughters excepted, to the general environment, (2) direct radiation from ISFSI operations and (3) any other radiation from uranium fuel cycle operations within the region.
- (b) Operational restrictions shall be established to meet as low as is reasonably achievable objectives for radioactive materials in effluents and direct radiation levels associated with ISFSI operations.
- (c) Operational limits shall be established for radioactive materials in effluents and direct radiation levels associated with ISFSI operations to meet the limits given in paragraph (a) of this section."

¹⁴ CSAR §8.1.2, "Accident Description/Discussion."

¹⁵ Estimated by the Staff to be approximately 0.00001 of the yearly dose limits for light water reactors under the ALARA concept of 10 CFR Part 50, Appendix I (SER §3.7).

¹⁶ Clark at 5.

mum dose to any individual's thyroid would be 100.003 to 150.003 rem. The 0.003 rem contribution from the Morris Operation would be insignificant in comparison with the DNPS contribution and the dose received by an individual located on the DNPS exclusion area boundary would still be within the guidance limits of 300 rem to the thyroid.¹⁷

The Staff found that the Morris Operation makes an insignificant contribution to the dose to any individual member of the public from combined operation of both facilities and cumulative effects of combined operation of the DNPS and the Morris Operation under normal or accident conditions would not constitute an unreasonable risk to the health and safety of the public. Thus, the Staff found that the Morris Operation meets the requirements of 10 CFR §72.72(e).¹⁸

The Board finds that the Intervenor has failed to set forth specific genuine issues of material fact regarding the inadequacies of the CSAR relative to the accident analysis requirements of 10 CFR Part 72. Therefore, relative to Contention 1(a), the Board concludes that there is no genuine issue of material fact which is triable.

Applicant's statement alleges fifteen material facts (13-27) as being applicable to Contention 1(b)(i) through 1(b)(iii).

In Intervenor's statement, it moved to strike Applicant's material fact numbers 13-18 and 21-27 as not being properly supported as required by 10 CFR §2.749. Intervenor moved to strike material fact number 20 as not being completely supported by proper evidence as required by 10 CFR §2.749. As indicated earlier, Intervenor provides no further analysis or justification for its allegation that the material facts are not properly or completely supported. Intervenor made no response to material fact number 19. The Minor Affidavit provides no further insight into the Intervenor's position, other than as indicated above under the discussion of Contention 1(a), and establishes no genuine issue of material fact relative to Contention 1(b)(i)-(iii).

The Staff believes that Contention 1(b)(i)-(iii) raises no genuine issue of material fact and that the statement of material facts presented by the Applicant is correct.¹⁹ The Staff supports Applicant's position that summary disposition of Contention 1(b)(i)-(iii) should be granted.

¹⁷ SER §7.8; Clark at 5-6; 10 CFR §100.11(a)(1).

¹⁸ Clark at 7, SER §3.7.

¹⁹ Clark at p. 2. With respect to Applicant's material fact number 17 Dr. Clark in his affidavit does explain that assuming a tornado missile penetrated the fuel basin structure, entered the basin water and ruptured all fuel rods in six boiling water reactor fuel bundles or four pressurized water reactor bundles, the whole body dose for a person at the site boundary would be less than 0.32% (rather than 0.12%) of the design basis accident dose limit specified

(CONTINUED)

Contention 1(b) refers to 10 CFR Part 20. However, as the Commission noted in the Supplementary Information accompanying the promulgation of 10 CFR Part 72,²⁰ 10 CFR Part 20 is limited to radiation protection concerns associated with normal operation and the means used to control access to areas of potential radiation exposure. When considering unexpected, accidental releases, the numerical guidance contained in 10 CFR §72.68 is utilized for spent fuel storage installations.²¹

With respect to Contention 1(b)(i), 10 CFR Part 72 requires protection from natural phenomena, *with the exception of tornado missiles*. In the Supplementary Information accompanying promulgation of Part 72, the Commission stated:

"Tornado missile protection at reactors is of concern because rupture of recently discharged fuel at a reactor could cause the potential release of volatile short-lived radionuclides, particularly ¹³¹I. Since the quantity of ¹³¹I present in aged fuel at an ISFSI is reduced a factor of 10⁹ due to radioactive decay in the first year after discharge, the potential risk from the rupture of aged fuel is orders of magnitude lower for an ¹³¹I release. The radionuclides which could potentially be released as a result of a tornado missile event are long-lived ⁸⁵Kr and ¹²⁹I. However an accident evaluation using conservative assumptions in NUREG-0575 [Final Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Reactor Fuel, August, 1979]. §4.2.3.2 demonstrates that the consequences from the release of the nuclides attributable to a tornado missile would not be significant. Hence, a requirement for protections from tornado missiles does not appear to be justified."²²

Nonetheless, both Applicant and Staff considered the effects of postulated tornado missile (e.g., planks, pipes, utility pole, automobile) accidents. The

in 10 CFR §72.68(b). Although Dr. Clark agrees with the reasonableness of the statement in material fact number 23, he has not performed a confirmatory calculation. His analyses use the more conservative criteria of assuming that the water boils, not accounting for evaporative cooling, which he considers to be physically more realistic.

²⁰45 Fed. Reg. 74693, at 74696, November 11, 1980.

²¹10 CFR §72.68 states that:

Controlled area of an ISFSI.

- (a) For each ISFSI site, a controlled area shall be established.
- (b) Any individual located on or beyond the nearest boundary of the controlled area shall not receive a dose greater than 5 rem to whole body or any organ from any design basis accident. The minimum distance from the spent fuel handling and storage facilities to the nearest boundary of the controlled area shall be at least 100 meters.
- (c) The controlled area may be traversed by a highway, railroad or waterway, so long as appropriate and effective arrangements are made to control traffic and to protect the public health and safety.

²²45 Fed. Reg. 74693, at 74698, November 12, 1980.

releases and exposures from a postulated tornado missile accident would be very small percentages of the dose guidance given in 10 CFR §72.68(b) and are acceptable.²³

With respect to Contention 1(b)(ii), both the Applicant and Staff have considered the risks and consequences from a release of radioactivity as a result of a loss-of-coolant accident. The CSAR concludes that the probability of excessively high radiation dose rates resulting from loss of fuel basin cooling is quite small and that undetected leakage from the fuel storage basins would not uncover the fuel. The Staff concluded that there can be no sudden loss of large quantities of water from the storage basins at the Morris Operation and any water losses which would occur would be small and nearby water sources are available to replenish any water losses which do occur.²⁴

The Morris Operation has been designed and constructed to insure that structures, systems and components important to safety can withstand the maximum potential natural phenomena, including earthquakes and tornadoes, to which the Morris Operation may be exposed. Thus, the Morris Operation meets the requirements of 10 CFR Part 72. Moreover, although §4.1.4 of "the MHB Report," which is cited as the basis for Contention 1(b)(iii), described a "tornado causing reduced water level," very little water would be lost by that mechanism. No mechanism has been identified whereby a rift in the building structure could cause a release of radioactivity in excess of the limits of 10 CFR §72.68.²⁵

With regard to Contention 1(b)(iii), both the Applicant and the Staff have considered the ability of the Morris Operation to withstand earthquakes. The Applicant's CSAR gives consideration to the geology and seismology of the Morris Site. Moreover, the Staff concluded in the SER that because the Morris Operation has been designed and constructed to safely withstand the maximum credible earthquakes, no releases of radioactivity would be expected as a result of an earthquake.²⁶

As indicated earlier Applicant's material facts 13-27 are adopted. For the reasons stated above, the Board concludes that there are no triable, genuine issues of material fact relative to Contention 1(b)(i)-(iii).

Contention 1(b)(iv) will be combined for discussion purposes with Contention 2.

²³ CSAR §8.8.3; SER §7.6; Clark at 9.

²⁴ CSAR §§8.2 and 8.3; SER §7.3; Clark at 10.

²⁵ SER §3.4; Clark at 10, 11 citing National Oceanic and Atmospheric Administration Report, "The Tornado, an Engineering-Oriented Perspective", NOAA Technical Memorandum ERL NSSL-82, §1.D, December 1977.

²⁶ CSAR §3.7.4, Appendix B, SER at §7.4; Clark at 12.

Contentions 1(b)(iv) and 2

Contention 1(b)(iv) is stated above.²⁷ Contention 2 alleges.²⁸

The Physical Security Plan does not meet the requirements of 10 CFR Part 73. Further, the CSAR does not provide an adequate assessment of credible risks of sabotage related events inasmuch that the advances in the technology of explosives, which could make sabotage a more probable event, have not been adequately addressed.

Applicant's statement alleges five material facts (28-32) as being applicable to Contentions 1(b)(iv) and 2. In Intervenor's statement, it moved to strike Applicant's material facts 28-31 as not being supported as required by 10 CFR §2.749. Intervenor provided no response to material fact 32.

Intervenor's response and accompanying affidavit provides little help in refuting Applicant's statement of material facts. It is alleged by the Intervenor that "the Morris Operation is a relatively accessible facility . . . , site workers have much greater accessibility to the fuel pool . . . , it is conceivable that external projectiles or missiles could penetrate the thin siding . . . , a saboteur bent on destruction . . . would find the Morris Operation fuel pool an easier target than a reactor core . . . and . . . the result of such an attack on Morris could be very devastating."²⁹ Completely lacking is a refutation of Applicant's material facts, any specific indication of where the CSAR is inadequate, and any mention of the alleged advances in the technology of explosives that are referred to in Contention 2.

There is no requirement in 10 CFR Part 72 that an SAR include a sabotage analysis, or assess credible risks of sabotage related events, or address advances in the technology of explosives. Rather, the Staff has sponsored a series of studies whose purpose is to estimate sabotage consequences and thereby provide a basis for the level of physical protection measures to be required at various kinds of nuclear facilities. The studies indicate that the consequences of sabotage of spent fuel at a facility such as Morris would be low. However, the technical parameters leading to the consequences estimate are dependent on the sabotage scenario assumed and are subject to some uncertainties. studies sponsored by the NRC have

²⁷ NEDM-20682 refers to Applicant's Sabotage Analysis for Fuel Storage at Morris, November, 1974.

²⁸ The first sentence of Contention 2 was dismissed by the Board as indicated earlier in this Order.

²⁹ Intervenor's Response at 8; Minor at 4-5.

not confirmed the existence of "any advances in the technology of explosives which could make sabotage a more probable event."³⁰

Although there is no requirement that the CSAR include a sabotage analysis or address advances in the technology of explosives, the CSAR must include a description of detailed security measures for physical protection including design features and physical security plans.³¹ The physical protection program for the Morris Operation is described in several Applicant documents.³² The Staff has reviewed these documents, which are considered to be proprietary under the provisions of 10 CFR §2.790, and has determined that the provisions of Subpart H of 10 CFR Part 72 have been met.³³

As indicated earlier, Applicant's contended material facts 28-32 are adopted. The Intervenor has established no genuine issue of material fact relative to Contentions 1(b)(iv) and 2. The Board concludes that there are no triable genuine issues of material fact relating to contentions 1(b)(iv) and 2.

Contention 3 alleges:

The CSAR underestimates or does not state fully the projected effects on the health of personnel, and their families from occupational exposure to radiation inasmuch as:

- (a) The CSAR does not state total whole body exposure to occupational personnel for the proposed licensed life of the Morris facility;
- (b) The CSAR does not project expected genetic effects on personnel or to the general population caused by such whole body occupation exposures;
- (c) The CSAR includes only irradiated fuel and contaminated basin water as radiation sources. Other tanks and pipes should be included as sources of occupational exposures;
- (d) The CSAR does not account for additional radiation exposure to occupational personnel from all anticipated activities at the facility (i.e., fuel disassembly, dry storage or compaction all of which are projected for the near future at Morris);
- (e) The CSAR does not address the absence of effective radiation monitoring of the air within the facility resulting from:

³⁰ Affidavit of Carl B. Sawyer Regarding Contention 1(b)(iv) and 2 (Sawyer) at 3-5.

³¹ 10 CFR §72.15(15) and Subpart H (Physical Protection) of Part 72.

³² Physical Security Plans (NEDS-14507-c), September, 1978; Safeguards Contingency Plan (NEDS-14567-C2), October, 1979; Security Personnel Training and Qualification Plan (NEDS-4507-C3), August, 1979; SER §11.

³³ SER §11; Affidavit of Russel R. Rentschler Regarding Contentions 1(b)(iv) and 2 (Rentschler) at 2.

- (i) No devices to measure radioactive materials in the air;
- (ii) No routine procedure to measure Kr 85.

Applicant's contended material facts 33-41 are applicable to Contention 3(a-e). These material facts are supported by reference to applicable regulations, the CSAR, Applicant's Operating Experience Report (Op. Exp. Rpt.) and a deposition, as well as by NRC Staff affidavits.³⁴ Intervenor abandoned that part of the contention referring to "families"³⁵ The surviving portion of the contention is directed toward the treatment of occupational exposure in the CSAR.

Intervenor has moved to strike material facts 33, 35, 37, 38, 40, and 41, asserting that these facts are not properly supported as required by 10 CFR §2.749 and to strike 34 on the ground that it is not a fact but a conclusion of law. Intervenor had no response to 36 and 39.

We deal first with subpart (d) of Contention 3. Intervenor concedes that "If indeed the activities alleged under this contention cannot legally be done under the proposed renewal then summary disposition is appropriate."³⁶ Further, Intervenor had no response to Applicant's material fact 36, which deals with 3(d). As stated by Applicant³⁷ and Staff,³⁸ none of the activities described in 3(d) (e.g., fuel disassembly, dry storage, or compaction) would be permitted under the current license or the proposed license renewal. Each of these activities falls within one or more of the categories requiring a license amendment outside the constraints of this proceeding (10 CFR §72.35(c)). Consequently, the Board concludes that there is no genuine issue of material fact relative to Contention 3(d).

Contention 3(a) and 3(b) deal with whole body exposure and genetic effects. Applicant's material facts 33 and 34 state that radiation exposure to personnel at the Morris Operation is well within the regulatory limits established in 10 CFR Part 20.³⁹ They note further that there is no requirement in 10 CFR Part 20 to project cumulative employee exposure for the term of the license and that Part 20 does not address genetic effects.

Supporting Applicant's material facts are the affidavits of Clark and Branagan, the EIA at §5.5, and the SER at §6.3. The Voiland deposition

³⁴ Operating Experience — Irradiated Fuel Storage at Morris Operation (NEDO-20969 B2/B3, §4), January, 1979; Deposition of Eugene E. Voiland taken September 4, 1980 (Voiland Deposition); Clark; and Affidavit of Edward F. Branagan, Jr. (Branagan) on Contention 3(b).

³⁵ Illinois' Answer to General Electric's Interrogatory No. 14.

³⁶ Illinois' Response at p. 10.

³⁷ Applicant's motion at 20; Voiland deposition at 37 *et seq.*; GE response to board question No. 1.

³⁸ Staff Answer at 19; Clark at 15-16.

³⁹ Op. Exp. Rpt., Ch. 4.

is also cited by Applicant in support of these facts. The Staff provided the information sought by Intervenor, i.e., that if receipt of 385 additional tonnes of spent fuel were permitted an estimated 0.02 cancer deaths may occur in the exposed population and about 0.035 genetic disorders may occur in all future generations of the exposed population, these impacts being insignificant in comparison with the natural incidence of cancer and genetic disorders.⁴⁰ As pointed out by the Staff, such estimates are not required of applicants or licensees.

Contention 3(c) asserts that the CSAR is deficient in stating that only irradiated fuel and contaminated water are included as radiation sources. Applicant asserts in material fact 35 that, on the contrary, the CSAR and other documentation supporting the license renewal deal with total occupational radiation exposure regardless of its source.⁴¹ The Staff concurs with Applicant.⁴² Intervenor's opposition to Applicant, quoted in full, is as follows:

"Again General Electric only states conclusions with only one passing reference to a sworn statement (Voiland Deposition p. 30). Because General Electric's motion is unsupported it must be denied as to Contention 3(c)."

Intervenor offers no facts or even any specified basis in support of this contention. The Board's review of the relevant documents leads us to conclude that Applicant's material fact 35 is correct and there are no triable genuine issues of material fact relative to Contention 3(c).

Applicant's statement proffers 5 material facts (37-41) as applicable to Contention 3(e). Intervenor moved to strike material facts 37, 38, 40, and 41 as not being properly supported as required by 10 CFR §2.749; no response was given to material fact 39. Applicant's material facts 37, 38, and 40 are documented by the CSAR.⁴³ Material fact 41 is also documented.⁴⁴

As pointed out by Applicant, contrary to Intervenor's assertion, the CSAR describes three independent capabilities to monitor the presence of airborne radioactive materials at the Morris facility. Further the CSAR⁴⁵ indicates that the Morris facility continuously measures and records the ventilation exhaust air flow rates. Applicant agrees that the Morris facility does not routinely measure Kr-85 because Kr-85 releases are well within applicable limits⁴⁶ and, because of the conditions prevailing in a spent fuel

⁴⁰ Branagan affidavit.

⁴¹ CSAR Ch. 7; Op. Ex. Rpt. Ch. 4.

⁴² Clark at pp. 2, 14, 15.

⁴³ CSAR §§7.3.3 and 7.4 *et seq.*

⁴⁴ Op. Exp. Rpt., Chapters 4 and 5.

⁴⁵ CSAR, Table 5-2.

⁴⁶ CSAR §7.3.3.

storage pool, are expected to remain so.⁴⁷ The Staff supports Applicant's position that summary disposition of Contentions 3(e)(i) and 3(e)(ii) should be granted. Staff cited as supporting documents the SER §6.4 and the Clark affidavit at 2, 16, and 17. As indicated by the Staff, continuous monitoring of krypton-85 was required at the Morris facility when it was to have been operated as the Midwest Fuel Recovery Plant.⁴⁸ Such monitoring is not required under current or requested license conditions. Further, should the continuous air monitoring systems indicate an increase in overall activity levels, a dual sampling system is available for direct measurement of krypton-85.⁴⁹ Intervenor offers as opposition to summary disposition of these contentions some vague references to Applicant's documents and a direction to see Minor affidavit at paragraph 7. This five-sentence paragraph is bereft of references. Indeed, there is not even any quantification, but just general statements, i.e., that there is a "large" inventory of radioactive krypton gas in the pool, which could be released "at any time" and appear "anywhere in the vicinity of the pool" or in downstream air. Our review of documents offered by the Applicant and the Staff convinces us that there is no genuine issue of material fact relevant to Contentions 3(e)(i) and 3(e)(ii).

Contention 4

Contention 4 alleges:

- (a) There is insufficient determination of ultimate decontamination and decommissioning costs. Costs have not been adjusted for inflation for the projected time of decontamination. CSAR pp. A7-13, A7-14. Without an accurate cost assessment GE cannot make a valid commitment to meet decommissioning costs;
- (b) There is insufficient assurance that the applicant will be financially capable to meet decontamination and decommissioning costs. Other than a general statement regarding GE's present relative solvency there is no verifiable financial statement to show GE can meet future costs as is required by 10 CFR §70.22(a). A bond or other assurance of financial capability should be required to provide a guarantee that decontamination and decommissioning costs will be fully covered;⁵⁰

⁴⁷ NUREG-0575, Final Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Power Reactor Fuel, Vol. 1, §4.2.2.2., pp. 4-15 (August 1979).

⁴⁸ Clark at 17.

⁴⁹ Clark, at 17, 18.

⁵⁰ The regulations in 10 CFR Part 72 establish the requirements, procedures, and criteria for the issuance of licenses to possess spent fuel and other radioactive materials associated with spent fuel storage in an ISFSI. Contention 4(b) was admitted prior to the date that the final Part 72 was promulgated. Section 72.18 defines the decommissioning plan requirements of 10 CFR Part 72. Section 72.14(e) defines the contents of an application including general and financial information (45 Fed. Reg. 74693).

- (c) There is no contingency plan to provide decommissioning of the Morris facility should an emergency, accident or other unforeseen event necessitate immediate and/or permanent abandonment of the Morris site;
- (d) There is no consideration of possible perpetual care and maintenance due to incomplete decontamination or decommissioning including:
 - (i) inability to dispose of LAW vault material;
 - (ii) residual contamination of waste vaults or other stationary parts of the facility;
 - (iii) ground water contamination which would require maintenance to prevent leaching offsite;
 - (iv) unavailability of offsite low-level disposal facilities for the dismantled facility and wastes.
- (e) The CSAR does not provide necessary financial arrangements to provide reasonable assurance that decontamination and decommissioning will be carried out as required by 10 CFR §72.14(e)(3) and 72.18 in that the applicant's projected costs do not take into account the costs of complete removal of all radioactive materials nor of complete restoration of the facility to unrestricted use.⁵¹

Applicant's statement alleges fourteen material facts (42-55) as being applicable to Contention 4. Intervenor moved to strike material facts 42-45 and 47-48 as not being supported by proper evidence, and material facts 50-54 as not being completely supported by proper evidence as required by 10 CFR §2.749. Intervenor provided no response to material facts 46 and 55. The Intervenor disputes material fact 49 and proffers as a material fact, "Morris could be abandoned because of an accident at Dresden." The Intervenor references the Minor affidavit in support of this material fact. However, paragraphs 8 and 9 of the Minor affidavit appear to refer to Contention 4 but provide no support for the Intervenor's proffered material fact.⁵² Thus, the Intervenor's one proposed material fact is not supported and is rejected.

Intervenor's response proffers no other specific material fact as being at issue relative to Contention 4. The Minor affidavit⁵³ includes several broad statements about decommissioning costs which do not state specific ma-

⁵¹ Contention 4(e), previously designated State Additional Contention 1, was added to this proceeding by the Board's Order Ruling on Additional Contentions dated March 16, 1981.

⁵² Minor, par. 8 at 5-6.

⁵³ Minor, par. 9 at 6.

terial facts. With respect to Contention 4(d) the Minor affidavit⁵⁴ indicates that the disposal of residual radioactive material:

. . . may prove difficult in terms of the radioactive contamination from basin water leaks in the past and possibly the future Some of the radioactive material resulting from the leak initiated by the cask-drop accident is described by G.E. as being in the cracks and crevices of the soil structure beneath the pool or in the perched water in the vicinity of the pool G.E. has not discussed how these and future leaked' radioactive contamination will be disposed of during decommissioning.

None of these statements are supported by reference to any documents or supporting material which are part of this proceeding, or otherwise.

Applicant's decommissioning plan is described⁵⁵ in the CSAR. The plan provides a general outline of decontamination practices and procedures and residual radioactive material removal. It concludes that the decommissioning costs, estimated at \$6,033,000 in 1978 dollars, are small compared to the total assets of the Applicant. Therefore, it is unlikely that Applicant would be unable to meet the associated financial commitment to decommission the facility.

The Staff believes that Contention 4 raises no genuine issue of material fact. The applicable section of 10 CFR §72.18 "Decommissioning plan, including financing" states:

- (a) Each application under this part shall include a proposed decommissioning plan that contains sufficient information on proposed practices and procedures for the decontamination of the site and facilities and for disposal of residual radioactive materials after all spent fuel has been removed, in order to provide reasonable assurance that the decontamination and decommissioning of the ISFSI at the end of its useful life will provide adequate protection to the health and safety of the public. This plan shall identify and discuss those design features of the ISFSI that facilitate its decontamination and decommissioning at the end of its useful life.
- (b) The decommissioning plan shall include the financial arrangements made by the applicant to provide reasonable assurance that the planned decontamination and decommissioning of the ISFSI will be carried out.

⁵⁴ Paragraph 5 of the Minor affidavit suggests that an accident at Dresden might contaminate the Morris Operation site and limit access of personnel to perform necessary maintenance and repair. No reference to abandonment of Morris because of an accident at Dresden can be found.

⁵⁵ Appendix A.7, "Decommissioning Plan".

Based on these criteria, the Staff believes that the information provided by the Applicant and the Staff's analyses show that none of the subparts of Contention 4 either correctly state an inadequacy in the Decommissioning Plan or have any basis in fact.

Contention 4(a): Inflation

The Staff compared the Applicant's decommissioning methods and costs with those contained in the document prepared for the NRC by the Battelle Pacific Northwest Laboratory, "Technology, Safety and Costs of Decommissioning a Reference Nuclear Fuel Reprocessing Plant" (NUREG-0278), which includes a section on the decommissioning costs of spent fuel storage operations. NUREG-0278, referred to in the MHB Report, indicates a total cost of \$58,000,000 to dismantle the reference reprocessing plant; however, total decommissioning of the fuel receipt and storage area is \$2,500,000. Adjusted for 15% inflation, the 1978 cost would be \$3,800,000, which is less than Applicant's 1978 estimate of \$6,000,000. Further, the Staff indicates that projected costs due to inflation are meaningless since the Applicant's assets can be expected to increase at roughly the same rate as costs.⁵⁶

The Staff concluded that there is reasonable assurance that the Applicant's estimate of the costs of decommissioning is conservative, and that the Applicant meets the applicable requirements of 10 CFR §72.18(b).

Contention 4(b): Financial Assurance

Applicant is a diversified manufacturer of high technology electrical and related equipment. For the nine months ending September 30, 1980, Applicant's consolidated gross sales were \$18.0 billion. Since 1973, Applicant's cash-on-hand balance has increased from \$296.8 million to \$1,287.4 million on September 30, 1980. Marketable securities increased from \$25.3 million to \$610.4 million and current accounts receivable increased from \$2.2 billion to \$4.5 billion.

The Staff concludes that such current resources along with Applicant's commitment that it will have available the resources deemed necessary to satisfy its obligation to decommissioning the Morris facility provide reasonable assurance that decommissioning and decontamination of the Morris facility will be carried out in accordance with the requirements of 10 CFR §72.18(b).⁵⁷

⁵⁶ SER §8.5; Affidavit of A. Thomas Clark and Francis P. Cardile on Contentions 4(a), 4(d)(ii) and 4(e) (Clark and Cardile) at 2-4.

⁵⁷ SER §8.5; Affidavit of Jim C. Petersen on Contention 4(b).

Contention 4(c): Emergency Abandonment

This contention alleges the lack of a contingency plan for decommissioning the Morris Operation following an accident. Based on the Staff's review and evaluation of the types of accidents which could occur at the Morris Operation and of the information presented in the Applicant's CSAR as to decommissioning, the present decommissioning plan and emergency plan are deemed adequate under any credible circumstance.⁵⁸

Although it is conceivable that, for a short period of time, the Morris Operation could be evacuated in the event of the most severe accident conditions at the DNPS, there is no foreseen circumstance that could cause immediate and permanent abandonment of the Morris site.⁵⁹

Contention 4(d): Perpetual Care

This contention indicates that the decommissioning plan is inadequate because there is no consideration of possible perpetual care and maintenance due to incomplete decontamination.

The Applicant indicates that the vaults and contaminated pipes, pumps, filters, storage hardware, etc., can be cut up, packaged, and disposed of as low-activity waste. Further, contaminated structures can be decontaminated by sand blasting, acid etching or detergent scrubbing. The Applicant indicated that all licensed radioactive material can be removed from the site.⁶⁰

The Staff indicates that the Applicant will be able to dispose of the LAW vault material and has described the methods to be used to decontaminate and decommission the vault in the CSAR.⁶¹ The Staff has determined that these methods are within the state-of-the-art for radiochemical process operations. The Intervenor's MHB Report, which is cited as the basis for this contention, also describes means of disposing of the vault material, and states that the cost and effort to dispose of the vault itself are large but not insolvable.⁶²

The Applicant has committed to decommissioning the Morris Operation in accordance with then applicable federal laws and regulations. At present, the release of sites for unrestricted use implies a level of decontamination in which the remaining radioactivity no longer poses a threat to the health and safety of the public. Removal of these forms of

⁵⁸ SER 7, §8.5; CSAR, Appendix A.7; Clark at 18.

⁵⁹ SER §7.8; Clark at 18.

⁶⁰ Voiland at 4.

⁶¹ CSAR, §A.7.3.3.1.

⁶² Clark at 19; MHB Report Section 6.1.

waste has been demonstrated at various Department of Energy locations. The Staff concludes that there will be no need for perpetual care of the Morris Operation after decommissioning due to residual contamination.⁶³

The CSAR discusses the leak collection, monitoring and pump-out provisions for the basins, LAW vault, and cladding vault. No leakage has been detected from the LAW tank or the cladding vault. These systems maximize the likelihood that any leaking radioactive materials will be returned to the system, and minimize the likelihood of contaminating the groundwater.⁶⁴

The Morris Operation has an independent water sampling program. Water samples are taken from 8 to 10 site monitoring wells and analyzed. Results from those water samples have indicated no discharge of radioactive material to the groundwater on-site. After decommissioning the site, monitoring wells would be used to assure the removal of all radioactive material which could constitute a threat to the public health and safety, and thus assuring that perpetual maintenance will not be required.⁶⁵ Low-level waste disposal sites are available at the present and they are expected to be available in the future. The Low-Level Radioactive Waste Policy Act states that each state is responsible for providing for disposal of low-level waste within its borders. The Department of Nuclear Safety of the State of Illinois has published a notice of proposed rulemaking in the *Illinois Register* to establish criteria for a low-level waste site in Illinois, noting that it is desirable that the facility be operational by 1986.⁶⁶

Contention 4(e): Complete Removal

The Applicant has stated its objective is "to decontaminate the site to a point where continued USNRC licensing is no longer required." The release of sites for unrestricted use does not imply the complete removal of all radioactivity. The Staff has concluded there is reasonable assurance that the Morris Operation will be decommissioned in a manner to provide adequate protection of the health and safety of the public in accordance with 10 CFR §72.18(b).⁶⁷

Contention 4 alleges that the decommissioning plan proposed in the CSAR is inadequate for a number of reasons. The Staff SER concludes that the application for license renewal meets the standards and requirement of the Commission's regulations. The Applicant has established

⁶³ Clark and Cardile at 2, 4-6.

⁶⁴ CSAR, §5.5.15, 5.6.1.2 and 5.6.2.2; Affidavit of Lewis G. Hulman and A. Thomas Clark on Contention 4(d)(iii) (Hulman and Clark) at 2-3.

⁶⁵ Hulman and Clark at 3.

⁶⁶ Affidavit of Kitty S. Dragonette on Contention 4(d)(iv) at 2.

⁶⁷ CSAR, Appendix A, §A.7.2.2; SER §8.5; Clark and Cardile at 2-4.

material facts as to which there is no genuine issue. The Intervenor has failed to establish a material fact at issue. Therefore, the Board concludes that relative to Contention 4 there is no triable genuine issue of material fact.

Contention 5 alleges:

The Emergency Plan in the CSAR is inadequate in that:

- (a) The plan does not specify which emergency procedures will be utilized to unload the spent fuel pool and to transport and/or store irradiated fuel in the event that an emergency should necessitate transfer of the spent fuel from the Morris spent fuel pool.
- (b) The CSAR should be supplemented to explain GE's plans for emergency transportation of irradiated fuel.
- (c) There is no reference to tests or other means by which it can be determined that the existing emergency plans are adequate. Adequate test programs of both communications systems and procedures should be documented prior to licensing.

Applicant's statement of material facts 56, 57, and 58 relate to contentions 5a, 5b, and 5c, respectively. Intervenor moved to strike 57 and 58 on the grounds that they were not properly supported by evidence as required by 10 CFR §2.749 and 56 on the grounds that it was not completely supported by proper evidence as required by the same regulation. In sum, Intervenor's major thrust in opposing Applicant's motion is that Applicant has not supported its conclusions with evidence and has not met its burden. The only other support for Intervenor's continued grip on this contention is the Minor affidavit at paragraph 10. We note parenthetically that the Minor affidavit is not numbered or outlined or any other way keyed to specific contentions. The Minor affidavit states that in the event the pools at the Morris facility are filled to the point that fuel movement is not possible and that the basin or liner is damaged such that fuel must be removed to facilitate repairs, then there should be a contingency plan for removing, loading, and shipping the fuel to some other place.

Applicant's material fact 56 indicates that the CSAR, chapters 1 and 5, and the Voiland affidavit at paragraph 5 document the procedures for loading fuel from storage into shipping casks and transporting it to a licensed receiver as well as recent experience in utilizing these procedures for a transfer from Morris Operation to the LaCrosse Boiling Water Reactor. Applicant's material fact 57 indicates that procedures for response to radiological transportation emergencies are outlined in Applicant's Transportation Emergency Plan⁶⁸; however, this is directed towards Applicant's assistance in the case of nuclear material being shipped to

⁶⁸ NEDO-24785, September 1980.

rather than *from* the Morris Operation. Material fact 58 indicates that Applicant does, in fact, have a program of testing and drills in compliance with applicable regulations.⁶⁹ As conceded by Intervenor in its opposition, "If the evidentiary support cited by General Electric does indeed establish that it is in compliance with all applicable regulations, summary disposition is appropriate."

The Staff supports Applicant's position that summary disposition of all of Contention 5 should be granted⁷⁰ and agrees that Applicant is in compliance with applicable regulations, in that Applicant's CSAR, Section 9.5, Emergency Plans, and the "Radiological Emergency Plans for Morris Operation" address the provisions of Section IV of Appendix E to 10 CFR Part 50 and that these emergency plans satisfy the requirements of 10 CFR §72.19. Further, the plan contains testing provisions which include frequent tests of the communications system. The conduct of tests and drills is assured by Staff inspection procedures.⁷¹

Our review of the documents supporting Applicant's and Staff's position, as well as our consideration of the Minor affidavit at paragraph 10, convinces us that the Morris Operation is in compliance with applicable regulations dealing with emergency plans and procedures, including testing and drilling of these plans and procedures. The information proffered by Intervenor as the basis for its continued hold on this contention offers us no facts which are genuine, material, or triable.

Contention 7 states:⁷²

The Nuclear Regulatory Commission has an obligation under the National Environmental Policy Act (NEPA) 42 U.S.C. 4332 (1969) to issue an environmental impact statement which will account for environmental impact of normal operation of the Morris facility.

Applicant's statement of material facts 59-61 are applicable to Contention 7. The Staff affidavit⁷³ supports Applicant's position that summary disposition of Contention 7 should be granted. Intervenor has moved to strike material facts 59-61 on the ground that they are premature, citing the Board's order of June 5, 1980, p. 19 which deferred a ruling on whether or not an Environmental Impact Statement (EIS) was required until evidence relating to potential environmental impacts was shown on

⁶⁹ NEDE-21894, June 1975 as supplemented.

⁷⁰ Affidavit of Clark and Fisher Regarding Contention 5. (Clark and Fisher)

⁷¹ SER §4.9, 8.4; Clark and Fisher at 4 and 5; Section 8.1 of the "Radiological Emergency Plan."

⁷² Contention 6 was dismissed from the proceeding by agreement in the Board's Prehearing Conference Order dated August 21, 1981.

⁷³ Affidavit of Keith R. Price (Price) annexed to NRC Staff Answer.

the record. Subsequent to that time, there was opportunity for discovery on that contention, as well as time for the Staff to determine whether or not it considered necessary the preparation of an EIS. The Staff's determination was that a negative declaration under 10 CFR §51.5(b) was appropriate and consequently issued its Environmental Impact Appraisal (EIA),⁷⁴ now part of the record in this proceeding. Support for the Staff's EIA was provided by the affidavit of Price, a consultant who participated in its preparation. As set forth in the EIA, the Staff has concluded that the proposed licensing action will not significantly affect the quality of the human environment and that there will be no significant environmental impact from the proposed action. The Staff supports Applicant's position that summary disposition of Contention 7 should be granted.

The documents proffered by Intervenor as basis for this contention, where they relate to environmental issues at all, support Applicant's and Staff's position rather than Intervenor's position.

Applicant has cited⁷⁵ a recent appeal board decision which fits the instant proceeding as well or better than the proceeding in which it was rendered:

"Indeed, the whole purpose in considering primary or secondary impacts of an action is to determine if they have a cause-and-effect relationship with any environmental *changes*. (Footnote omitted.) Where, as here, there is no change in the environmental status quo that purpose need not be served." (Emphasis in original.)

Consumers Power Company (Big Rock Point Nuclear Plant) ALAB-636, 13 NRC 312 (1981).

The Applicant proposes only to continue, without change, the activities it has carried on for nearly 10 years, which activities were licensed subsequent to NEPA and after environmental review under that law. Intervenor has not brought forth, even after ample opportunity for discovery, evidence (or even allegations) of any specific impact which would require issuance of an EIS.

Consequently, we conclude that there are no triable genuine issues of material fact relative to Contention 7.

Contention 8

Contention 8 alleges:

The CSAR does not provide for the safe control of the facility under off-normal or accident conditions as required by 10 CFR

⁷⁴ NUREG-0695, June 1980.

⁷⁵ Applicant's Motion at 38-39.

§72.72(j) in that, it does not provide for adequate access to and from the control room during and after release of radiation in excess of 10 CFR Part 20 within the facility.

Applicant's statement alleges three material facts (62-64) as being applicable to Contention 8. Intervenor moved to strike material facts 62-63 as not being properly supported as required by 10 CFR §2.749 and moved to strike material fact 64 as not being completely supported by proper evidence.

Intervenor's response proffers no specific material fact as being at issue and the accompanying affidavit⁷⁶ does not address Contention 8 at all. As discussed under Contention 1(b), the terminology in 10 CFR Part 20 is limited to radiation protection concerns associated with normal operations and the means to control access to areas of potential radiation exposure. The guidance in 10 CFR §72.68. "Controlled Area of an ISFSI." covers releases of radiation from an ISFSI resulting from accident conditions.

Contrary to the assertion in Contention 8, 10 CFR §72.72(j) does not require that a SAR "provide for access to and from the control room during and after release of radiation in excess of 10 CFR Part 20 within the facility." Rather, 10 CFR §72.72(j) provides that the control room or control room areas should be designed to provide safe control of the ISFSI under off-normal or accident conditions.⁷⁷

"Control Room or Control Areas. A control room or control areas shall be designed to permit occupancy and actions to be taken to monitor the ISFSI safely under normal conditions, and to provide safe control of the ISFSI under off-normal or accident conditions."

The Commission, in the Supplementary Information accompanying the promulgation of 10 CFR Part 72, recognized that:

"The safety of an ISFSI (Independent Spent Fuel Storage Installation) is achieved by static means, primarily its configuration. Its safety is not dependent on dynamic reactions to the manipulation of controls like a reactor."⁷⁸

The Applicant's criteria for accessibility of equipment during emergencies and control room access are stated in its CSAR.⁷⁹ The Staff considered the extent of the impact of any credible accident which could occur at the Morris Operation and determined that no emergency would inhibit access to any structure, system or component because the severity of radiological impact caused by any credible accident is low.⁸⁰

⁷⁶ Intervenor's Response at 14; Minor affidavit.

⁷⁷ 10 CFR §72.72(j) states:

⁷⁸ 45 Fed. Reg. 74693, at 74698, November 12, 1980.

⁷⁹ CSAR §4.2, Sec. 4.3.1.

⁸⁰ SER §3.9.

The control room at the Morris Operation can be entered by any of three doors. Access to the main building is possible from two principal entrances and from any of three other doors accessible by an exterior staircase. Once inside the building there are a number of ways to get from any of the building entry doors to any of the control room doors. Even so, occupation of the control room is not necessary for the safe operation of the facility. At the current heat generation of the fuel, coolant pumps and ventilation fans could be turned off and it would take over six months for the water to evaporate down to the top of the fuel. The water temperature during that time would not exceed 120° F.⁸¹

Contention 8 addresses the effect of control room access during and after release of indication within the facility. However, even if it was necessary to evacuate the Morris Operation for external reasons, such as under the most severe accident conditions at the Dresden reactors, occupation of the control room at the Morris Operation would not be necessary.⁸²

The Board concludes that there is no triable genuine issue of material fact relative to Contention 8.

Contention 9 states:

Applicant's operator training and certification program is inadequate to insure safety as required by 10 CFR Part 72, Subpart I in that Applicant's program fails to:

- (a) Establish any minimum academic requirement; and
- (b) Establish any criteria or numerical standards for passage or failure of testing and verification requirements.

Applicant's statement of material facts 65-66 are applicable to Contention 9. Material fact 65 states that Applicant has submitted to the NRC its plan for operator training and certification at Morris Operation consistent with 10 CFR §72.92, supporting this statement with reference to the Voiland affidavit at paragraph 7, the SER at §8.3.2, and Appendix E to the Motion for Summary Disposition. The Staff supports Applicant's Motion for Summary Disposition.⁸³ Intervenor nevertheless moves to strike this material fact as not being completely supported by proper evidence as required by 10 CFR §2.749. Material fact 66 states that Morris Operation personnel and supervisors are trained, tested, certified and regularly re-trained and recertified, supporting this statement with the Voiland affidavit, paragraph 7. Intervenor had no response to this material fact.

⁸¹ Voiland at 6-7.

⁸² SER §§3.12, 7.8; Clark at 21.

⁸³ Staff Answer at p. 34, Clark at 2.

In this proceeding the Applicant submitted under oath its Operator Training and Certification program, page F-4 (Attachment F to General Electric's Application for a license under 10 CFR Part 72). This document indicates that passing grades must be attained on both written and walk-through examinations.

Intervenor disclaims any attack on the regulations in its response to Contention 9.⁸⁴ However, the Board finds it difficult to interpret its opposition as being anything other than an attack on the adequacy of the regulations. We observe that Applicant has complied with the regulations as they are stated; Staff agrees; and Intervenor, by its own admission, states that "(t)here may be no facts in dispute" on this issue. However, Intervenor urges that "as a matter of law and logic summary disposition cannot be granted in favor of General Electric." The Board cannot find any genuine issue as to any material fact relevant to Contention 9 which is triable.

Contention 10 alleges:

Applicant's Technical Specifications do not comply with 10 CFR §§72.16 and 72.33 in that nothing therein precludes applicant from receiving, handling and storing damaged spent fuel and nowhere has Applicant identified, analyzed or evaluated such receipt, handling or storage of damaged spent fuel in accordance with any section of 10 CFR Part 72.

Applicant's statements of material facts 69, 70, and 71 are pertinent to this contention. Intervenor made no response to 69 or 71 and 70 is objected to as not properly supported.

Intervenor's response proffers no material statement of fact in issue and only states that the Voiland affidavit says that Morris has the capability of storing *most* damaged spent fuel without any adverse impact and that since "most" is not defined or limited in any way, Applicant has not met its burden and summary disposition must be denied.⁸⁵

As the Staff points out, nothing in 10 CFR §72.16 or §72.33 prohibits the receipt of "damaged" spent fuel at the Morris Operation. However, the Applicant has proposed Technical Specification 4.8.1, which requires an analysis of the coolant from the first cask flush to determine if the contamination is within the limits of 10 CFR §71.35(a)(4). Technical Specification 4.8.1 also provides that if these limits are exceeded, the fuel in the cask shall be assumed to have failed, and action shall be taken in accordance with established procedures. Section 7.3.2 of the CSAR pro-

⁸⁴ Intervenor's response at 14.

⁸⁵ Intervenor's Response at 15-16.

vides that if damaged fuel should be discovered special handling procedures will be followed and that defective fuel would be canned or otherwise contained.⁸⁶

The Board finds that the applicant's statements of material facts are correct and are supported by the Voiland affidavit and that damaged spent fuel can be safely stored at Morris in accordance with Part 72 without adverse impact.

The Board concludes that there is no triable genuine issue of material fact relative to Contention 10.

Board Question No. 1

This Board question sought information as to what activities would or could be performed at the Morris site under a license extension as requested. This question and its three subparts have been fully answered by the Applicant and the Staff. There remains no issue before the Board.

Conclusion

It is concluded that there are no genuine issues of material facts to be heard and decided. The Applicant's motion for summary disposition is granted. The record before this Board is closed and the matter is referred to the Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission for appropriate action.

IT IS SO ORDERED.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Andrew C. Goodhope, Chairman
ADMINISTRATIVE JUDGE**

**Dr. Linda W. Little
ADMINISTRATIVE JUDGE**

**Dr. Forrest J. Remick
ADMINISTRATIVE JUDGE**

Dated at Bethesda, Maryland,
this 2nd day of March, 1982.

⁸⁶Clark at 23-24.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Peter B. Bloch, Chairman
Dr. Jerry R. Kline
Mr. Frederick J. Shon

In the Matter of

Docket Nos. 50-440-OL
50-441-OL

CLEVELAND ELECTRIC
ILLUMINATING COMPANY, *et al.*
(Perry Nuclear Power Plant,
Units 1 & 2)

March 3, 1982

The Licensing Board rules on intervenor's request to admit additional contentions and to expand the scope of previously admitted contentions.

RULES OF PRACTICE: ADMISSIBILITY OF LATE-FILED
CONTENTIONS

Intervenor's allegation that it learned of an issue through a recently published newspaper article does not constitute a showing of good cause for the late-filing of a contention where intervenor has not shown that the newspaper article reflects any new research or previously unavailable insights; has not established any nexus between the issue and the Perry facility; and has not demonstrated any competence to assist the Board in resolving the issue.

RULES OF PRACTICE: ADMISSIBILITY OF CONTENTION

A contention presenting a generic issue is not admissible when intervenor fails to demonstrate any specific nexus between the issue and the facility that is the subject of the proceeding.

ADMISSIBILITY OF CONTENTION: HYDROGEN GENERATION

Because recent Commission statements contained in a proposed rule and a proposed policy statement, though tentative, suggest that the requirements for the control of accident-generated hydrogen might be made more stringent in the future, the Licensing Board may consider admissible a contention raising issues related to hydrogen generation, even though a contrary rule, or no rule might ultimately be enacted. To wait for the final rule would risk delay in the issuance of a license.

RULES OF PRACTICE: AMENDMENT OF CONTENTION

Intervenor's motion to enlarge a previously admitted contention was not ripe for decision where the contention, as admitted, was sufficiently broad to permit discovery of all relevant information, and intervenor would have the opportunity later to present any new material obtained through discovery either in a response to a motion for summary disposition or as the basis for a new contention.

MEMORANDUM AND ORDER (Concerning Late-Filed Contentions: Quality Assurance, Hydrogen Explosion, and Need for Increased Safety of Control System Equipment)

On December 18, 1981, and on January 8, 1982 Sunflower Alliance, Inc., *et al.* (Sunflower) requested that new issues be admitted to the proceeding. In one motion, it filed an additional contention regarding the fact that "control systems" at Perry are not safety grade. In another motion, it requested to expand the scope of the quality assurance contention which we had admitted in this proceeding. *See* LBP-81-24, 14 NRC 175, 210-212 (1981). In still another motion it requested permission to resubmit a contention, previously rejected by the Board, concerning whether Perry is safe from a possible hydrogen-explosion accident. *See Id.* at 207-209. These motions have been responded to by Cleveland Electric Illuminating Company, *et al.* (applicant) and by the Commission's staff (staff). Then, as required by Order of this Board, Sunflower has replied.

We have decided that the scope of the quality assurance contention need not be expanded because the scope of discovery under the admitted quality assurance contention appears to be broad enough to permit investigation of serious quality assurance deficiencies with safety or environmental implications. Should there be a motion for summary disposition, Sunflower will have an opportunity to demonstrate that there are additional

genuine issues of fact that it has discovered and that should be admitted to a hearing. See *Consumers Power Company (Big Rock Point Plant)*, LBP-82-8, 15 NRC 299, 329, 331-332 (1982). In the absence of such a motion, it may file for the expansion of its contention based on the new information discovered by it.

We also have decided to admit the hydrogen explosion contention. On the other hand, the control systems contention shall not be admitted as an issue in this proceeding.

I. CONTROL SYSTEMS CONTENTION

Sunflower contends:

That the applicant undertake to assure that the Perry Nuclear Power Plant's control systems be upgraded, perhaps by making them redundant, so that no single failure in the system will cripple the control system.

It relies on a failure which occurred at the Rancho Seco Nuclear Power Plant in Clay Station, California. That incident was triggered when a dropped electric light bulb damaged the direct current electrical system servicing the control panel for the reactor. Intervenor alleges as a ground for late filing that it was not aware of the issue in March of 1981. In the absence of any representation to the contrary, we infer that Sunflower first learned of this issue through a newspaper article in the New York Times on December 6, 1981, as suggested to us by staff.

We find that Sunflower has not shown good cause for late filing and that it has not demonstrated its ability to contribute to the resolution of this issue. Hence, it fails to meet the criteria for late filing. It also has failed to show that this contention has a "nexus" to the Perry facility. For that independent reason, Commission precedent also requires that we reject this contention.

We agree with applicant that a general newspaper article, not reflecting any new research or previously unavailable insights, cannot provide an acceptable excuse for late filing. *Houston Lighting and Power Company (Allens Creek Nuclear Generating Station (Unit 1))*, January 12, 1982 (unpublished) at 3-4. To rule otherwise would all but nullify the late-filing restriction because even matters broadly known could be brought to an intervenor's attention through a newspaper article about a matter that was already quite stale. See our previous order, LBP-82-11, 15 NRC 348, 351-352 (1982).

The material contained in the cited article was not only stale, but notoriously so. One of the most celebrated documents in this field, the Kemeny Commission Report (*Report of the President's Commission on the Accident at Three Mile Island; The Need for Change: The Legacy of*

TMI, October 1979) had this to say as part of its "Overview" or summary chapter, on pages 19 and 20:

In the licensing process, applications are only *required* to analyze "single-failure" accidents. They are not required to analyze what happens when two systems fail independently of each other, such as the event that took place at TMI. There is a sharp delineation between those components in systems that are "safety-related" and those that are not. Strict reviews and requirements apply to the former; the latter are exempt from most requirements — even though they can have an effect on the safety of the plant. Instead, there should be a system of priorities as to how significant various components and systems are for the overall safety of the plant.

[Emphasis in original.] this issue also has been addressed in NUREG-0585, at 3-1 through 3-3 and A-14. The issue also is considered to be an unresolved safety issue, by action of the Commission on December 24, 1980. NUREG-0705 at A-9 to A-11. It was summarized in the Commission's 1980 Annual Report to Congress.

Under the circumstances, Sunflower would have to demonstrate very great competence to assist the Board in resolving this issue, and it would have to show in what way the Perry plant is deficient with respect to the safety of its control system. Sunflower has done neither. It shows only a superficial understanding of the issue, based on a newspaper article, and an ignorance of the entire previous history. It shows no nexus between its contention and the specifics of the Perry reactor.

We are required to reject this contention on the independent ground that it is a generic issue which has not been specifically related to the Perry reactor. *Gulf States Utilities Company (River Bend Station, Units 1 and 2)*, ALAB-444 (1977) 760 at 771 ff. In that case, the State of Louisiana attempted to litigate issues included in a document entitled "Technical Safety Activities Report" and in another document, the regulatory guides, issued by the Commission to assist applicants in determining the information staff will require from them and the standards staff will apply in reviewing the application. *Id.* at 767. The State submitted the table of contents of the Technical Safety Activities Report, with 88 items circled. It also submitted the numbers and titles of 14 regulatory guides said to be "substantially relevant." *Id.* at 771.

In *Gulf States* the Licensing Board required a "nexus" to the proceeding; that is, allegations establishing with respect to each contention, a relationship to the River Bend application. *Ibid.* The Appeal Board affirmed, saying:

It seems clear to us that, in order to introduce a new issue into a proceeding, a party—and likewise an interested state—must do more than present what amounts to a check list of items contained

in the TSAR or in regulatory guides. The very nature of the TSAR and regulatory guides supports this conclusion.

Id. at 772. The Appeal Board then discussed the nature of these documents and the reasons why generic issues considered in these documents need not necessarily raise issues litigable in a particular proceeding. *Ibid.* The Appeal Board then stated:

To establish the requisite nexus between the permit or license application and a TSAR item (or Task Action Plan), it must generally appear both (1) that the undertaken or contemplated project has safety significance insofar as the reactor under review is concerned; and (2) that the fashion in which the application deals with the matter in question is unsatisfactory, that because of the failure to consider a particular item there has been an insufficient assessment of a specified type of risk for the reactor, or that the short-term solution offered in application to a problem under staff study is inadequate.

Id. at 773.

We do not consider the nexus requirement to be a mere technicality. It makes good sense in the overall context of Commission decisionmaking. Generally, applicant and staff are aware of unresolved safety issues and a portion of the SER addresses them. We even have an obligation to consider *sua sponte* whether the staff has adequately addressed these issues. *Northern States Power Company (Monticello Nuclear Generating Plant, Unit 1)*, ALAB-620, 12 NRC 574 (1980). In addition, staff is doing research on these questions. In that context, litigation in a particular case is merely redundant, unless intervenor examines the relevant plant-specific documents and identifies a specific problem or set of problems which have not been addressed. Given the extensive attention given to these documents by applicant and staff, this is no easy task for a volunteer, intervenor group. However, these safety proceedings are designed to consider serious safety issues and the difficulty arises from the nature of the issues intervenor wishes to litigate and not from any desire on the part of the Commission to erect artificial barriers to full participation. On the contrary, if Sunflower manages to raise serious issues (as it appears to have done in other motions decided in this memorandum) it will receive a receptive audience in this Licensing Board.

We consider that the *Gulf States* rule is applicable here *a fortiori*. By referring to specific Commission documents rather than to a newspaper article, the State of Louisiana gave greater specificity to its allegations than Sunflower has done here. Nevertheless, the State was found not to have alleged the requisite nexus to the proceeding. It follows that Sunflower also has not alleged the requisite nexus.

If Sunflower should receive genuine new information in the future bearing on the nexus of this contention to this proceeding, it may of course attempt to file this contention again.

II. HYDROGEN CONTROL CONTENTION

Sunflower's contention 7, as originally submitted was:

Petitioners allege that there is insufficient documentation of the ability of the containment structures of said facilities to safely inhibit a hydrogen explosion of the magnitude and type which occurred at Three Mile Island Unit 2 near Harrisburg, Pennsylvania and of which the Commission is aware.

Initially, we excluded this contention pursuant to *Metropolitan Edison Company (Three Mile Island Nuclear Station, Unit No. 1)*, CLI-80-16, 11 NRC 674 (1980).

In its filing, Sunflower has attempted to meet the criteria for litigating hydrogen issues set forth in the Three Mile Island case. It does this by asserting the existence of a pipe break in the reactor coolant pressure boundary, a failure of the ECCS to maintain coolant due to several possible categories of deficiency (including operator error), the generation of hydrogen through a Zircaloy/water reaction, the attainment of a flammable or combustible concentration of hydrogen, an explosion and breach of containment. Motion to Resubmit Contention 7 at 3. It also adds that a similar scenario could commence with an anticipated transient without scram (ATWS). As cause for late filing, Sunflower asserts the promulgation of the final rule on "Interim Requirements Related to Hydrogen Control" (46 Fed. Reg. 58484, December 2, 1981). It states that the rule did not cover Mark III containments, such as is to be employed at Perry.

As applicant and staff have indicated, Sunflower apparently is not aware of the issuance on December 18, 1981, of a *Proposed Rule*, "Interim Requirements Related to Hydrogen Control." In the Supplementary Information included in that Proposed Rule, relating to hydrogen control for Mark III BWRs, the Commission stated:

[I]t has become clear that additional protection is required to provide assurance that large amounts of hydrogen can be safely accommodated by these plants. The particular type of hydrogen control system to be selected is left to the discretion of the applicant or licensee; however, it must be found acceptable by the NRC based upon suitable programs of experiment and analysis. . . . Whatever systems are finally proposed and approved for the long term, large amounts of hydrogen must be safely accommodated, and operation of the system, either intentionally, must not further aggravate the course of an accident or endanger the

plant during normal operations. The amount of hydrogen to be assumed in the design of the hydrogen control system is that amount generated by assuming that 75% of the fuel cladding surrounding the active fuel region reacts with water. . . .

. . .

Based on the state of technology as of August 1981, the Commission believes that control methods that do not involve burning provide protection for a wider spectrum of accidents than do those that involve burning. 46 *Fed. Reg.* 246, 62281, 62282.

Also relevant to the Commission's current policies concerning the control of hydrogen is the Proposed Policy Statement related to Safety Goals for Nuclear Power Plants (February 11, 1982). In that proposed statement, the Commission proposes a guideline that the likelihood of a large-scale core melt accident should be less than one in 10,000 per year of reactor operation. It also states that it "recognizes the importance of mitigating the consequences of a core-melt accident", in part through assuring the integrity of the containment. Memorandum at 13.

We find these recent Commission utterances, proposed and tentative though they may be, to be inconsistent with the TMI decision on which we relied. The Commission now appears to be of the view that the assumptions of §50.44 are unrealistic and that some additional steps may need to be taken. While we could adopt a wait-and-see attitude on this important matter, we believe it to be more prudent to proceed on the assumption that by the commencement of operation of Perry, the requirements of 10 CFR §50.44 will be more stringent. Thus, under the general powers of the presiding officer, we choose to consider this contention admissible, though it might ultimately come to pass that a contrary rule (or no rule) will be enacted. 10 CFR §2.718. To wait to see would be to risk needing to delay the issuance of a license for lack of forethought.

In any event, the apparent change in Commission attitudes provides us with more favorable leanings toward the hydrogen contention. In this instance, Sunflower has not only suggested specific scenarios which might meet the Commission's previous objections, it also has provided increased specificity for its contention and, especially in the following passage, has demonstrated its competence to pursue this issue:

It is questionable whether the hydrogen gas control system at Perry will be operated in a timely and effective manner. First, all components of this system (analyzers, mixers, recombiners, and purge capability) are activated manually by the operator (FSAR, Section 6.2.5). Relying on manual operation during the stressful emergency situation following a LOCA would likely increase the possibility of operator error. The operation of the hydrogen ana-

lyzers, the first step in the hydrogen control sequence, may be delayed for 15 minutes to one hour after the LOCA (FSAR, Section 6.2.5.2.1). This delay seems inappropriate, especially in light of the standard of 10 CFR §50.44(d)(1): "A time period of 2 minutes shall be used as the interval after the postulated LOCA over which the metal-water reaction occurs."

Secondly, the effectiveness of hydrogen recombiners is questioned in Regulatory Guide 1.7 (p. 1.7-4): "Hydrogen recombiners can process the containment atmosphere at a limited rate of 100-150 scfm per recombiner. Therefore, an inordinately large number of recombiners would be required to control the hydrogen concentration that is postulated to be generated in the first 2 minutes of the LOCA." Perry uses 2 recombiners per unit; each recombiner is sized for a 100 scfm flow rate (FSAR, Section 6.2.5.2.3).

This intervenor considers containment purging as a hydrogen control measure to be unacceptable, as this results in radioactive releases to the environment.

Motion to Resubmit Contention 7 at 4.

In this cited passage, Sunflower adds specificity to its hydrogen contention. Applicant argues that Sunflower has, nevertheless, failed to show a basis for its contention because: (1) operators need not respond in two minutes, as the amount of hydrogen generated in that time period would be far below flammability limits, which would not be reached (pursuant to regulatory guidelines on the amount of hydrogen generated) in a Mark II containment even after 10 hours; and (2) Regulatory Guide 1.7's statement about the number of recombiners that would be needed is not applicable to large containments, such as the Mark III at Perry. On the second point, we find that Sunflower has a basis for its doubts about recombiners, based in part on the Regulatory Guide's concern about small containments, in part on the absence of authority concerning the safety of recombiners in large containments, and in part on the finding in the Proposed Rule on "Interim Requirements Related to Hydrogen Control" that control methods involving burning are not as effective "for a wide spectrum of accidents" as are other methods.

Furthermore, a portion of this passage establishes a nexus to this proceeding by its citation to the FSAR and its assertion that Perry uses two recombiners per unit. It demonstrates the seriousness of Sunflower's concern with this issue and its ability to contribute to its resolution.

Whether or not a party has shown good cause for late filing relates in part to the safety or environmental importance of the issue it has raised. In this case, there is no doubt as to the importance of the issue nor the direct concern of the Commission with this area of safety. In addition, the

regulatory environment in which this contention is brought has shifted substantially, adding another reason in support of late filing.

Another factor that is balanced in determining whether there is good cause for late filing is whether the intervenor's delay in filing will contribute to an overall delay in the decision of the case. Such delays, resulting from late filings, are unduly costly to applicants and are not favored. Indeed, if the late filing of a contention is part of a pattern of delay, such a pattern also might be considered in deciding whether there is good cause for late filing. However, Sunflower has been cooperative in its approach to this proceeding. It raised this particular contention at an early date but found it necessary to amend its filing to meet rather stringent criteria that the Commission has applied to hydrogen contentions. Since it is still early in the history of the case, we do not anticipate that delay in filing this contention will cause any delay in the decision of the case. *Compare Houston Lighting and Power Company (Allens Creek Nuclear Generating Station, Unit 1)*, January 12, 1982 (unpublished) at 3-4, 5-6.

Under the circumstances, we find that, on balance, the criteria for late filing have been met (10 CFR §2.714(a)(1)) and we admit this contention in the following form:

Issue #8: Applicant has not demonstrated that the manual operation of two recombiners in each of the Perry units is adequate to assure that large amounts of hydrogen can be safely accommodated without a rupture of the containment and a release of substantial quantities of radioactivity into the environment.

We have intentionally excluded from this contention any reference to the mechanism by which hydrogen can be generated. Sunflower has suggested several mechanisms, any one of which would do. Hence, we think they have met the Commission's former criteria for admission of this contention. It seems to us that little purpose would be served by litigating the likelihood that any one of the suggested scenarios (each one of which includes a mechanism by which the reactor would experience a failure of the core cooling system) could occur. There is little doubt that any one scenario, except perhaps for the occurrence of human error, would be highly unlikely to occur. However, we could embark on an endless search for multiple, unlikely events unless we assay that tortuous path in advance and refuse to enter.

III. MOTION TO ENLARGE THE QUALITY ASSURANCE CONTENTION

The quality assurance issue admitted in this proceeding is:

Issue #3: Applicant has an inadequate quality assurance program that has caused or is continuing to cause unsafe construction.

This issue was further limited by us in our September 9, 1981 Memorandum and Order, 14 NRC 682, 686-87, in which we stated that:

[T]he admission of this issue was intended to be limited to the quality assurance implications arising from the stop work order issued to [applicant] . . . and the steps taken by it to remedy the alleged deficiencies leading up to the stop work order.

Now, Sunflower approaches us with a motion that its admitted contention should be enlarged. However, we do not consider its motion to be ripe. It is already permitted to engage in discovery relevant to its contention or to applicant's defense. 10 CFR §2.740(b)(1). In that context, relevance may be broadly interpreted in the interest of full disclosure and it is doubtful that serious discovery requests, related to the safety or environmental consequences of quality deficiencies would be irrelevant to the admitted contention. Even old deficiencies may be related to the damage that may have been caused by the quality assurance problems leading to the stop work order. More recent deficiencies may be related to the effectiveness of the steps taken to remedy the previous deficiencies.

There will be time for Sunflower to add to its contention, if necessary. Upon a motion for summary disposition, it may offer genuine issues of fact relevant to its contention and not falling strictly within it. If these genuine issues of fact have an important safety significance they may be admitted as newly discovered material. *Consumers Power Company (Big Rock Point Plant)*, LBP-82-8, 15 NRC 299, 329, 331-332 (1982). In addition, new material uncovered during discovery may at that time form the basis for a new contention.

At the present time, Sunflower's motion contains many alleged quality assurance deficiencies. Some, but not all have apparent safety significance and might form the basis for enlarging this contention at some subsequent time. However, we consider it preferable to defer ruling on the enlargement of the contention until we can be more fully informed of the available evidence.

We note that this contention and Contention #1, relating to emergency planning, may raise extensive evidentiary questions. Should the discovery process become cumbersome, the Board is prepared to preside over discussions among the parties designed to make the process work fairly and efficiently.

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is this 3rd day of March, 1982,

ORDERED

(1) Sunflower Alliance Inc., *et al. s.* (Sunflower) December 18, 1981, Motion for Leave to file an additional contention concerning the safety of control systems is denied.

(2) Sunflower's January 8, 1982, motion to expand its quality assurance contention is denied as not ripe for decision.

(3) Sunflower's motion to resubmit its Contention 7 is granted in part. The newly admitted issue is:

Issue #8: Applicant has not demonstrated that the manual operation of two recombiners in each of the Perry units is adequate to assure that large amounts of hydrogen can be safely accommodated without a rupture of the containment and a release of substantial quantities of radioactivity into the environment.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE

Jerry R. Kline,
ADMINISTRATIVE JUDGE

Frederick J. Shon
ADMINISTRATIVE JUDGE

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

James L. Kelley, Chairman
Dr. A. Dixon Callihan
Dr. Richard F. Foster

In the Matter of

Docket No. 50-413-OL and 50-414-OL
ASLBP Docket No. 81-463-01-OL

DUKE POWER COMPANY, et al.
(Catawba Nuclear Station,
Units 1 and 2)

March 5, 1982

The Licensing Board rules on pending petitions for intervention and contentions filed in support of those petitions.

RULES OF PRACTICE: CONTENTION; REQUIREMENT OF SPECIFICITY

The requirement of the Commission's Rules of Practice that the basis for each contention be set forth with reasonable specificity facilitates Board determinations whether contentions are litigable, and helps assure that other parties are sufficiently put on notice that they will know at least generally what they will have to defend against. These purposes do not imply that a high standard of specificity for contentions is required at so early a stage of the proceeding as the initial prehearing conference. The principal function of contentions at this juncture is to place some reasonable limits on discovery, and this may be accomplished with contentions more broad and general than the revised contentions that can be developed after discovery and that will, after the final prehearing conference, structure the hearing.

RULES OF PRACTICE: CONTENTION; REQUIREMENT OF SPECIFICITY

Where, at the time of the first prehearing conference, key documents such as the Commission Staff's Safety Evaluation Report, its Environmental Impact Statement, most of the off-site emergency plans and portions of the Applicant's Final Safety Analysis Report had not yet been written, the argument that intervenors must plead all contentions with reasonable specificity prior to the conference, and that further contentions based on information disclosed in subsequently available documents must be subjected to the restrictive standards for admissibility of late-filed contentions, was unreasonable and not required by the Commission's Rules of Practice as written or by prior decisions.

RULES OF PRACTICE: CONTENTION; EMERGENCY PLANNING

The Commission's regulations plainly contemplate that the adequacy of off-site emergency plans for counties and municipalities near the facility that is the subject of the proceeding can be contested in their specific details by intervenors. 10 CFR 50.47(a).

RULES OF PRACTICE: ADMISSIBILITY OF CONTENTION

Where the documents likely to provide the necessary specifics for the formulation of contentions were not yet available, the Board would not disallow proposed contentions for lack of specificity but would admit such contentions conditionally, subject to the requirement that intervenors advancing such contentions review the relevant documents promptly after they become available and, within 30 days thereafter, submit revised contentions meeting the specificity requirements of the Rules of Practice, or else abandon the contentions.

RULES OF PRACTICE: ADMISSIBILITY OF CONTENTION

The adequacy of any revised contentions based upon documents filed subsequent to the initial prehearing conference would be judged by the general principles applicable to contentions, including specificity. However, since the "lateness" of such contentions would be entirely beyond the control of the sponsoring intervenor, the additional criteria normally applied to late contentions under the Rules of Practice would not be applied.

RULES OF PRACTICE: ADMISSIBILITY OF CONTENTION; SECURITY PLAN

Because intervenor could not reasonably be required to advance specific contentions about a security plan it had never seen, and because it had expressed a formal interest in the plan, the Board could order Applicants to grant intervenor access to the plan as necessary to a proper decision in the proceeding. The Board would, however, condition such disclosure order on intervenor's having obtained the services of a qualified security plan expert, and would impose other limitations on access to the plan. Accordingly, the Board would allow intervenor 10 days in which to consider whether it wished to pursue the matter further.

MEMORANDUM AND ORDER

(Reflecting Decisions Made Following Prehearing Conference)

On January 12 and 13, 1982, the Board conducted a prehearing conference in York, South Carolina, pursuant to 10 CFR 2.751a. The primary purpose of the conference was to consider pending petitions for intervention and contentions filed in support of those petitions.

Admission of Parties. Petitions to intervene had been filed by four organizations and by the State of South Carolina. Three of the petitioning organizations appeared and participated in the conference: Carolina Environmental Study Group ("CESG"), represented by its President, Mr. Jesse L. Riley; Palmetto Alliance ("Palmetto"), represented by counsel, Mr. Robert Guild; and Charlotte-Mecklenburg Environmental Coalition ("CMEC"), represented by its Chairman, Mr. Henry A. Presler. The standing of these organizations is described in their petitions and is not disputed by the Applicants¹ or the Regulatory Staff. In its response to the CMEC petition, the Staff had raised a question about Mr. Presler's authority to represent that organization. At the conference, Mr. Presler served copies of authorizing affidavits from representatives of constituent organizations of CMEC, thus laying the Staff's question to rest.

A petition for intervention is to be granted if it establishes standing and pleads at least one litigable contention with reasonable specificity. 10 CFR 2.714; *Philadelphia Electric Co. (Peach Bottom Atomic Power Station)*, 8 AEC 13, 20 (1974). As discussed hereafter, each of the three organizations appearing at the conference put forward one or more contentions which we

¹ Duke Power Co. is the lead Applicant in this proceeding. It also acts as agent for the other owners of the facility, North Carolina Municipal Power Agency Number 1, North Carolina Electric Membership Corporation, and Saluda River Electric Cooperative, Inc.

find admissible, or at least conditionally admissible. Accordingly, the Board orders CESC, Palmetto and CMEC admitted as parties to this proceeding. In addition, the petition of the State of South Carolina to intervene as an interested State pursuant to 10 CFR 2.715(c) is granted. The State was represented at the hearing by Mr. Richard P. Wilson, an Assistant Attorney General. However, the State did not participate actively, nor did it file any separate contentions.

The fourth petitioning organization, Safe Energy Alliance of Charlotte, North Carolina, did not file contentions in support of its initial petition and, although served with notice, did not appear at the prehearing conference. Mr. Presler of CMEC filed an affidavit from an officer of Safe Energy Alliance stating that CMEC would represent the interests of the Alliance in the proceeding. As stated on the record, in these circumstances the Board considers the separate Safe Energy Alliance petition as having been withdrawn. Tr. 3-4. Alternatively, that petition is denied for want of prosecution.

Specificity of Contentions and Available Information. The three petitioning organizations filed a total of fifty-two contentions.² The Applicants and the Staff separately oppose admission of forty-seven of these contentions. Because the Applicants and the Staff largely disagree about the handful of contentions they would admit, all but two of the Intervenor's fifty-two proposed contentions are opposed by the Applicants, the Staff, or (in most cases) by both. We are admitting half of the Intervenor's proposed contentions, in whole or in part. However, only one of these contentions is being admitted unconditionally. Twenty-five contentions are being admitted subject to certain specified conditions.

By far the most frequent basis for objection by both the Applicants and the Staff is an alleged lack of specificity in the contention. In some cases, we find this objection to be well taken. But in others where we also find a lack of specificity, we nevertheless reject that objection at this stage of the proceeding because of the limited information presently available to the

² CMEC filed 4 contentions, Palmetto 29, and CESC 19. Palmetto also filed an additional 19 contentions identical to CESC's 19. CESC labeled 3 other paragraphs as "contentions" (numbered 4, 7 and 14) which we view as legal argument and procedural requests. CESC's, paragraphs 7 and 14 are pertinent here; they request that the prehearing conference (which we take to mean this conference held pursuant to 10 CFR 2.751a) not be held until 90 days after the Staff's environmental impact statement and safety evaluation report are available. They argue that it is "essential to permit CESC . . . to take into consideration Staff's views in regard to environmental . . . matters" in framing contentions. While we find substantial merit in this argument, we believe that the 90-day guideline in 2.751a and the Commission's "Statement of Policy on Conduct of Licensing Proceedings" (46 Fed. Reg. 28533) indicate the need to get the proceeding started earlier, as we are doing here. However, by granting conditional admission to contentions that now may be unduly vague only because certain documents are presently unavailable, we are being responsive to the very real problem CESC raises. CESC's paragraph 4 speaks to certain legal issues we find it unnecessary to reach.

Intervenors. Because of the importance in these rulings of the concept of specificity in contentions, a few words about that subject are in order before we turn to the individual contentions before us.

Section 714(b) of the Commission's Rules of Practice (10 CFR 2.714(b)) requires that "the bases for each contention [be] set forth with reasonable specificity." It is not enough, for example, merely to allege that aspects of an applicant's plans will not comply with Commission regulations. A contention must include a reasonably specific articulation of its rationale — e.g., why the applicant's plans fall short of certain safety requirements, or will have a particular detrimental effect on the environment. This specificity requirement serves several purposes. It facilitates board determinations whether contentions are litigable. For example, a contention is to be excluded if it is, in substance, an impermissible attack on a Commission rule, or if it is not within the scope of the proceeding. See *Philadelphia Electric Co.*, *supra* at 20.

Another purpose of specificity in contentions is "to help assure that other parties are sufficiently *put on notice* so that they will know *at least generally* what they will have to defend against." *Philadelphia Electric Co.*, *supra* at 20 (emphasis added). However, this language does not imply a high standard of specificity at this early stage of the proceeding. As discussed below (at 575) the purpose of revising and refining contentions at the final prehearing conference is to make the issues for hearing more specific in the light of completed discovery. Reflecting this aspect of the process, most preparation for hearing takes place after the final prehearing conference.

The specificity requirement is a perfectly reasonable one, so long as the factual information necessary for specificity is available to an intervenor. Unfortunately, because of the way the hearing process is structured that is often not the case, particularly in the early stages of the proceeding. Under the rules, a petitioner for intervention in an operating license case like this one must file at least some contentions before the first prehearing conference, which the rules contemplate will take place a few months after the application is noticed for hearing. At that time, the applicant's final safety analysis report ("FSAR") (or at least most of it) and environmental report ("ER") are available to petitioners for intervention. However, a number of other potentially important documents usually are not then available, most notably the Staff's Safety Evaluation Report ("SER") and draft environmental impact statement and the report of the Advisory Committee on Reactor Safeguards. In addition, certain of the applicant's documents, such as emergency plans, may not be available.

That is the situation here. Of the key documents just mentioned, only the Applicants' FSAR (most of it) and Environmental Report are now available for public inspection. The Staff's SER and impact statement,

most of the off-site emergency plans and portions of the FSAR have not yet been written. In addition, the Applicants' security plan, while in existence, is being withheld pursuant to Commission regulations. 10 CFR 73.21.

The Applicants and the Staff nevertheless argue that the Intervenor should be required to plead *all* of their contentions with reasonable specificity by the first prehearing conference, even contentions in areas like emergency planning, where the documents necessary for informed pleading are not yet available. The Applicants contend that:

[W]hen Palmetto Alliance seeks to put in issue a matter which arguably is not covered in Applicants' filings, it is incumbent on it to specify precisely the nature of its allegation and provide in detail the bases for it The Commission's procedures contemplate, and require, adequate contentions to be framed on the basis of information available to petitioners at the time the notice of hearing is published. Absence of documents which are not available until the NRC Staff completes its review of an application is not good cause for failing to provide adequate specification of, or basis for, a contention, or for reserving the right to raise a contention at a later time.³

The Staff, in substance, concurs.⁴ The Applicants and the Staff concede, as they must, that an intervenor may file a contention later, pursuant to 10 CFR 2.714(b), based on information disclosed in a document first becoming available at a later date. But there's a catch.⁵ In their view, such "late" contentions would have to surmount all of the hurdles applicable to contentions filed late for other (and usually less justifiable) reasons.⁶

The Board believes that the Applicants' and Staff's stated position on this question is (1) not required by the rules as written or by prior decisions, (2) unreasonable, and (3) probably in conflict with governing statutes. As to the first point, the rules as written do not explicitly require that *all* contentions be filed before the first prehearing conference, subject

³ Applicants' Response to Palmetto Contentions, pp. 8-9.

⁴ Staff Response to Contentions, p. 8, note 14. See also Tr. 110-114, 215, 231, 322-323

⁵ For a similar catch, see Heller, *Catch 22*, p. 47 (Dell ed.).

⁶ Section 2.714(a) erects five separate hurdles to "nontimely" contentions, only one of which (good cause) would presumably be surmounted by a showing of new information. In the main, these criteria are inappropriate for application to a contention that is "late" for reasons wholly beyond the intervenor's control. For example, the last criterion concerns the extent to which the contention will "broaden the issues or delay the proceeding." An issue based on new information will almost necessarily broaden the issues and it may well delay the proceeding. But the responsibility for those effects must be borne by the applicant or the Staff for producing a "late" informational document.

only to a highly restricted right to file a "late" contention later.⁷ And the cases cited by the Applicants and Staff have held only that some (by inference, at least one) contentions should be pled by that time. See *Wisconsin Electric Power Co.* (Koshkonong Nuclear Plant), CLI-74-45, 8 AEC 928 (1974); *Northern States Power Co.* (Prairie Island Plant), ALAB-107, 6 AEC 188 (1973), *aff'd*, *BPI v. AEC*, 502 F.2d 424 (C.A.D.C. 1974). Those cases emphasized the "wealth" of information available at the early stages of the proceeding in the applicant's FSAR and environmental report, the assumption being that at least some contentions could be gleaned from these typically voluminous documents. But none of those cases focused on the situation that concerns us here — i.e., forcing an intervenor to plead specific contentions in an area, such as emergency planning, where the relevant information simply is not yet available. Apparently in recognition of the unfairness in such a squeeze play, it has not been uncommon for licensing boards to admit vague contentions conditionally, subject to later specification, or to defer rulings on some contentions until the necessary documentation is available. See, e.g., *Commonwealth Edison Co.* (Byron Nuclear Power Station), LBP-80-30, 12 NRC 683 (1980); *Commonwealth Edison Co.* (Quad Cities Station), LBP-81-53, 14 NRC 912 (1981). The Appeal Board's very recent decision in *Tennessee Valley Authority* (Browns Ferry Nuclear Plant), ALAB-664, confirms that licensing boards have discretion to defer rulings where a document (such as a draft environmental impact statement) is needed in order to assess a contention.

The unreasonableness of the Applicants' and Staff's position has been suggested by the preceding discussion and is perhaps best illustrated by an example from this case. The off-site emergency plans for counties and municipalities near the facility are being prepared, but are not yet complete. Tr. 110-112. The regulations plainly contemplate that the adequacy of such plans, in their specific details, can be contested by intervenors. 10 CFR 50.47(a). At this juncture, possibly in reaction to the Applicants' and Staff's position that it must plead all of its contentions now, and not having any idea what those plans will contain, Palmetto tenders two broadly-worded emergency planning contentions, to which the Applicants and Staff then object as lacking in "specificity." Placing the cart squarely before the horse, the Applicants argue that Palmetto should be required to express its "concerns" now, that it "should know if they have a concern" before the emergency plans are even prepared. Tr. 112.

⁷ A literal reading of the last sentence of 10 CFR 2.714(b) arguably leads to that conclusion. As we demonstrate, however, other compelling considerations require a different conclusion. We should, in addition, read section 2.714(b) in the light of our duty under 10 CFR 2.718 "to conduct a fair . . . hearing."

There are several practical reasons to reject this argument. In the first place, it is very difficult to express concrete concerns about emergency planning in the abstract, without reference to specific emergency plans. It is probably a waste of time for all concerned, including this Board, for intervenors to develop "concerns" that emergency planners, working independently, may be fully addressing. The sensible approach is for a potential intervenor first to study proposed emergency plans, and then to decide whether he finds flaws in them which he may wish to contest.

Moreover, forcing intervenors to shoot in the dark may encourage fabrication of artificial, frivolous and perhaps even spurious contentions, because by necessity they are based on little more than imagination.⁸ From its quite different perspective, the applicant may have no incentive to facilitate the early completion of all emergency plans. This is so because, under the Applicant's and Staff's theory we are rejecting, if emergency planning or any other aspect of a nuclear power plant application is simply delayed until after the first prehearing conference, defects may be effectively insulated from scrutiny in the hearing process. Such a result seems inconsistent with the hearing requirements of the Atomic Energy Act, 42 U.S.C. 2239.

Indeed, we think that the Applicants' and Staff's position on the specificity question is, as they would have us apply it here, of very questionable legality not only under the Atomic Energy Act (as to safety issues), but also the National Environmental Policy Act (NEPA) (as to environmental issues). Section 189(a) of the Atomic Energy Act provides for a hearing upon the request of an interested person in certain kinds of licensings, including operating license proceedings. To be sure, the courts have held that this right is not absolute, that it may be conditioned, for example, upon the filing of contentions prior to discovery. *BPI v. AEC*, 502 F.2d 424 (C.A.D.C. 1974). However, the *BPI* decision did not discuss and apparently assumed that information requisite to formulation of contentions was available in that case. Where, as in this case, much of the necessary information is not yet available, a court might well hold that section 189(a) requires an equivalent opportunity to frame a contention promptly following the availability of the information. If that were not allowed, the exercise of the right to a hearing would be impermissibly hindered, or virtually foreclosed, by an unreasonable procedural requirement.

⁸ For example, in the *Diablo Canyon* case, the intervenors eventually gained access to the facility's security plan on the basis of a prior contention that the facility was "vulnerable to sabotage not only from land, but from sea." *Pacific Gas and Electric Co. (Diablo Canyon Nuclear Power Plant)*, ALAB-410, 5 NRC 1398, 1400 (1977). We suspect that the *Diablo* intervenors had no prior knowledge about the security plan and that this contention was made up out of whole cloth.

NEPA requires that environmental questions be open for consideration "to the fullest extent possible" throughout the agency review process, including the hearing process. NEPA, Section 102. In the landmark *Calvert Cliffs* decision, the court invalidated several provisions of the AEC's original implementing rules, viewing the agency's "crabbed interpretation of NEPA" as "a mockery of the Act." *Calvert Cliffs Coordinating Committee v. AEC*, 449 F. 2d 1109 (C.A.D.C. 1971). Among the nullified rules was one which barred licensing boards from considering environmental questions unless they were raised by a party. The court viewed the rule as an unnecessary and therefore illegal restriction on the "fullest possible" consideration of the environment. Similarly in the present context it could be forcefully argued that a "rule" requiring the pleading of all NEPA contentions before the Staff's impact statement is even written is an unnecessary and therefore impermissible restriction on agency consideration of the environment, yet another "crabbed interpretation of NEPA."⁹

In light of the foregoing considerations, the Board rejects the argument that we should disallow a proposed contention for lack of specificity if a document likely to provide the necessary specifics is not yet available. In this case, such documents include the Staff's Safety Evaluation Report and draft environmental impact statement, portions of the Applicants' FSAR yet to be supplied, and the off-site emergency plans for the counties and municipalities near the plant.¹⁰ As discussed contention-by-contention hereafter, contentions that may be addressed in one of those documents will, if they are otherwise acceptable, be admitted conditionally despite a present lack of specificity. The intervenor advancing such a contention will be required to review the relevant document promptly after it becomes available, and to then either abandon or revise the contention to meet the specificity requirements of 10 CFR 2.714(b). Revised contentions are to be filed within 30 days following receipt of the relevant document.¹¹ The adequacy of any revised contentions will be judged by the general principles applicable to contentions, including specificity. However, the additional

⁹ The Applicants' and Staff's position here is more questionable legally than the rule struck down by the *Calvert Cliffs*' court. That position undercuts the right of an adversary party to raise litigable issues about the Staff's impact statement, the traditional and most commonly-used means of testing a statement. *Calvert Cliffs* imposed on licensing boards a NEPA requirement to raise environmental issues *sua sponte*, a much less significant way of testing an impact statement than through adversary contentions.

¹⁰ The security plan for the facility stands on a somewhat different footing and is treated separately at pp. 589-590, below.

¹¹ We are admitting a few somewhat vague contentions on the condition that they will be revised and made more specific following discovery. Discovery on these contentions is to be completed within 90 days of this Memorandum and Order, and revised contentions are to be submitted withing 30 days thereafter.

criteria normally applied to late contentions under 10 CFR 2.714(a)(1)(i)-(v) will not be applied to contentions revised pursuant to this paragraph; their "lateness" is entirely beyond the control of the sponsoring intervenor.

What we have just said applies only to contentions for which little or no information has been supplied by the Applicants in their FSAR or Environmental Report. If substantial relevant information has been supplied and referenced in the Applicants' opposition pleading, the contention will be judged for specificity now and rejected if found unduly vague. However, should a document containing new information or analysis on the subject become available later, the Intervenor may within 30 days file a revised contention based upon it. Again, the criteria of 10 CFR 2.714(a)(1)(i)-(v) will not be applied to such a contention. Debatable questions about whether information or analysis is "new" will generally be resolved in the Intervenor's favor.

Specificity Through Discovery. An additional consideration affects the level of specificity required at this initial stage of the proceeding. Our admission of contentions will be followed by an extended period of discovery, during which the intervenors can learn additional factual details about their areas of concern. The principal functional purpose of contentions at this juncture is to place some reasonable limits on discovery. Boards have recognized that those discovery limits can, without prejudice to the hearing process, be more broad and general than the revised contentions that can be developed after discovery and which will ultimately structure the hearing. See, e.g., *Southern California Edison Co.* (San Onofre Nuclear Generating Station), LBP-82-3, 15 NRC 61, 71-73 (1982). The rule prescribing a final prehearing conference after the close of discovery (10 CFR 2.752) explicitly contemplates amending the "pleadings" and clarification of the "issues." For these reasons, we now apply less stringent standards of specificity than we will apply at the final prehearing conference.

Contentions Admitted.

CMEC Contentions 1-4 are admitted, subject to the following conditions:

(1) Should these contentions go to hearing, the focus will be on the Staff's impact statement, not the Applicants' Environmental Report, because the substantive NEPA obligation is discharged through the impact statement. Accordingly, CMEC shall review the Staff's draft environmental impact statement promptly after it becomes available and revise these contentions, as appropriate, in the light of that statement.

(2) CMEC Contention 1 is revised to read as amended on page 2 of the "NRC Staff Response to Reworded Contention 1," dated February 22, 1982. Mr. Presler's proposed revised version of CMEC Contention 1, dated February 1, 1982, is withdrawn. CMEC Contention 3 is revised to read as agreed to by the parties and as set forth in the CMEC "Further Proposal" pleading dated February 22, 1982. The Staff's objection to the reference in Contention 3 to Contention 2 is overruled.

(3) The Commission's *Black Fox* decision generally authorizes litigation of contentions about the long-term health effects of radiation, the thrust of Contention 4. See *Public Service Co. of Oklahoma* (Black Fox Station), CLI-80-31, 12 NRC 264 (1980). In view of the Applicant's stipulation to this contention, we are not inclined to reject it at this juncture in spite of its lack of specificity. However, this contention shall be made more specific or withdrawn after the Staff's draft impact statement is available.

Palmetto Contention 27 is admitted unconditionally.

The following Palmetto contentions are admitted conditionally, in whole or in part, subject to the specified conditions:

Palmetto 1: This contention about long-term health effects is similar to CMEC Contention 4. It is somewhat more specific in referencing the work of particular researchers, but it still falls short in that regard. It might, for example, specify the respects in which the BEIR III report and the Commission's food chain analyses are allegedly deficient. It is admitted conditionally, subject to further specification following availability of the draft environmental impact statement.

The Applicants specifically object to the part of this contention which focuses on health effects from the uranium fuel cycle, viewing it as an attack on the values established by rule in Table S-3. This argument is answered by footnote 1 to Table S-3, which states in pertinent part:

Table S-3 does not include health effects from the effluents described in the Table These issues may be the subject of litigation in the individual licensing proceedings.

Palmetto 2: This Contention faults the Applicants and the Staff for failing to assess the impacts of accidents beyond the design basis of the facility. This contention is premature. Pursuant to the Commission's *Statement of Interim Policy*, 45 Fed. Reg. 40101, the Staff will be assessing the impacts of such accidents in its environmental impact statement. The Staff's draft impact statement should explicitly address the concerns being raised in this contention or explain why they need not be addressed.

The Staff's "special circumstances" argument at pp. 10-11 of its response seems to assume that consideration of the effects of serious accidents need only be included in an impact statement for a facility that meets that test. While that was once the rule under certain Commission adjudicatory decisions (see *Public Service Co. of Oklahoma* (Black Fox

Station), CLI-80-8, 11 NRC 433 (1980)), those decisions have now been superseded by the *Statement of Interim Policy* under which all final impact statements issued after June 9, 1980 are to include such consideration.¹² The special circumstances test applies only to plants under construction where particular design changes might be warranted. We make no judgment here about whether such changes are warranted for Catawba because we are ruling on a contention that does not call for design changes, only "assessment of impacts." As it does on other contested issues in an operating license proceeding, the Licensing Board will rule in the first instance on whether the impact statement's consideration of accidents pursuant to the *Policy Statement* is adequate.

The *Policy Statement* calls for discussion of severe accidents in applicants' environmental reports filed after July 1, 1980. Since the report for Catawba was filed prior to that date, no such discussion is necessary. Accordingly, this contention is admitted, subject to striking "The Applicants" from the first sentence and to the condition that it will be revised and made more specific in light of the draft impact statement; otherwise, it shall be withdrawn.

Palmetto 3 and 4: These contentions question the adequacy of emergency plans for the facility in various respects. As drafted, they are extremely vague. However, they are vague because the emergency plans for the counties and municipalities near the plant have not yet been prepared. In these circumstances, about all an intervenor can do is express very general concerns. The most he should be required to do at this point is express an interest in the subject. These contentions are admitted, subject to their revision for specificity promptly following the availability of the pertinent plans. Revised contentions in this area need not be restricted to the subjects referred to in these contentions.

Palmetto 6, 7 and 18: These contentions, as drafted, are at best only marginally acceptable from the standpoint of specificity. However, they are being admitted conditionally because they concern the actual safety of construction and operation of the Catawba plant, issues that are at the core of responsibilities as an operating license board. There were indications at the conference that some further specification of these contentions could be made now. Tr. 118, 176-177. These contentions can be explored in discovery and we expect the intervenors to make them more specific, or to withdraw them, following discovery.

Palmetto 8: This contention questions the qualifications of reactor operators and shift supervisors for Catawba because of an alleged lack of

¹² The Commission's words are that the Staff should "initiate treatments of accident considerations . . . in its ongoing NEPA reviews, i.e., for any proceeding at a licensing stage where [an FES] has not yet been issued. *Id.* at 40103.

relevant operating experience. This contention is sufficiently specific and would be allowable but for our concern whether it may constitute an impermissible attack on a Commission rule. The information about qualifications contained in Section 13.1 of the FSAR does not speak directly to the allegation in this contention that the operators and supervisors for Catawba lack sufficient "hands on" experience with large PWR's. The Applicants' pleading argues (at p. 17) that there is a pending rulemaking on this subject which precludes this contention, and refers to SECY-81-84. No rulemaking has been initiated as a result of that Staff proposal; the matter is presently under study. Therefore, that proposal does not bar this contention. However, we desire the parties' views on whether the present rules in 10 CFR Part 55, particularly sections 55.11 and 55.24, bar this contention.

In addition, certain requirements relating to operator qualifications have been imposed as part of the Three Mile Island Action Plan in NUREG-0737. Clarification Item I.A.2.1. Pursuant to the Commission's *Guidance Statement* of December 16, 1980, the sufficiency of TMI requirements may be contested by intervenors in licensing cases, suggesting that the present contention is allowable. However, certain of these TMI requirements were subsequently proposed in rule form, including certain experience requirements for senior reactor operators. 10 CFR 50.34(f)(1)(ii). See *Licensing Requirements for Pending Operating License Applications*, Proposed Rule, 46 Fed. Reg. 26491. We desire the views of the parties on whether these rather convoluted developments have the effect of barring litigation of Palmetto's Contention 8. These views should be served by March 26, 1982. In the meantime, this contention is admitted conditionally, subject to reconsideration in light of the parties' further views.

Palmetto 10: This contention seeks consideration of the economic costs of severe (so-called "Class 9") accidents. As noted above with respect to Contention 2, consideration of such accidents will be included in the Staff's draft impact statement including, in the words of the Interim Policy Statement, "socioeconomic impacts that might be associated with emergency measures during or following an accident." This contention is admitted, subject to its being revised or withdrawn following availability of the draft impact statement.

Palmetto 14, 15, 16, 17 and 38 (CESG 11): These five contentions all relate in one way or another to the expansion of the spent fuel storage pool at Catawba since the construction permit was issued and to the consequent possibility that the Applicants may later store spent fuel from other Duke facilities (such as McGuire and Oconee) at Catawba. These contentions raise questions about the safety and environmental acceptability of transportation of spent fuel to Catawba and its storage there, under both normal and accident conditions.

We can rule out certain aspects of these spent fuel contentions at this point. We are disallowing Contention 14 because, as we read it, it seeks to avoid application of the Table S-4 values about transportation impacts solely on the ground that the spent fuel would be destined for the Catawba storage pool, instead of the hypothetical reprocessing plant referred to in the Table S-4 rule (10 CFR 51.20(g)(1)). The contention does not postulate why the impacts of transporting to these different types of destinations would be different. We think they would be substantially the same and therefore that the Table S-4 values would apply.

Palmetto 17 would require consideration of the Applicants' provisions for caretaking of the spent fuel following the expiration of any Catawba operating license. This proceeding concerns the operation of the Catawba Station. This contention lies beyond its scope and is rejected. Moreover, the issue is generic within the nuclear power industry and is currently subject to Commission rulemaking. The Appeal Board has accordingly ruled that litigation of this topic would constitute a collateral attack on the rulemaking. *Public Service Electric and Gas Co.* (Salem Nuclear Generating Station), ALAB-650, 14 NRC 43, 68-69 (1981).

The first two sentences of Palmetto 38 (CESG 11) are in the nature of legal argument about the expansion of the fuel pool. The last sentence seeks to raise a safety issue (albeit an unclear issue) about the consequences of enlarging the pool. We are rejecting Contention 38 as a separate issue. However, the substance of the matters sought to be raised in the last sentence may be raised under the broader spent fuel contentions we are conditionally admitting, as explained hereafter.

From what we know now about the Applicants' plans for the Catawba spent fuel pool, we tentatively believe that consideration of the safety and environmental aspects of transporting and storing fuel there from other Duke facilities would be appropriate in this proceeding. However, we need additional information and the views of the parties on certain issues before we can make final rulings on contentions in this area. These questions are prompted by the following considerations.

Applicants state in their application (at pp. 11-12):

Applicants further request such additional source, special nuclear and by-product material licenses as may be necessary or appropriate . . . for authority to store irradiated fuel from other facilities Duke has no present plans to utilize this storage alternative but, rather, considers it prudent planning to have this storage as one of the alternatives available.

The application apparently does not request explicit authority to transport (as distinguished from authority to store) spent fuel from other Duke facilities to Catawba.

The jurisdiction of a licensing board is normally established by the notice of opportunity for hearing and the subsequent notice of establishment of the board. See *Pacific Gas and Electric Co.* (Diablo Canyon Plant), CLI-76-1, 3 NRC 73, 74, note 1 (1976). Here, those notices refer only to the operating licenses for Catawba. There is no explicit reference to materials licenses for storage and transportation of fuel from other Duke facilities.

Duke's plans for handling of spent fuel, including the "Cascade Plan," were the subject of extended discussion in *Duke Power Co.* (Amendment to Materials License), LBP-80-28, 12 NRC 459, 469-72 (1980), *rev'd*, ALAB-651, 14 NRC 307 (1981). There, environmental analysis was carried out for only a small part of the larger plan, and an "assessment" was deemed sufficient. However, if we are being asked to authorize comparatively more extensive shipment and storage of fuel, inclusion of this subject in the environmental impact statement for the operating licenses may be necessary.

In light of the foregoing considerations and information available to them, the Applicants and the Staff are to address the following questions; the Interveners are free to comment on such of these question as they choose:

1. Applicants only to answer. What are Duke's plans with reference to storing fuel from other Duke facilities at Catawba. Be more specific than in the quoted sentence from the application. Describe the "Cascade Plan"; what is its present status?

2. What licensing authority is Duke presently seeking to transport or store fuel from other facilities to or at Catawba? What additional authority does it intend to seek? Does Duke intend to secure now, in connection with the operating licenses for Catawba, all of the authority it needs to transport and store spent fuel at Catawba from other facilities to the capacity of the Catawba storage pool?

3. Does this Board presently have jurisdiction over applications to store or transport spent fuel from other facilities? If not, could it and/or should it be given such jurisdiction?

4. Does the Applicants' environmental report include an adequate discussion of any plans to store or transport spent fuel from other facilities at Catawba?

5. Staff only to answer. Does the Staff intend to include in its draft impact statement discussion of transportation of spent fuel from other facilities to Catawba and its storage there? If so, why? If not, why not?

Responses and any comments on these questions shall be mailed by March 26, 1982.

Palmetto 15 concerns the environmental costs of both the transportation of spent fuel to Catawba from other Duke nuclear plants and its storage in the used-fuel pool. This contention is admitted conditionally, provided the words "Away From Reactor (AFR)" are stricken from the first paragraph

and "as an AFR" are stricken from the third paragraph. The Applicants' request that "may" be substituted for "intend to," also in the third paragraph, is denied. This is an Intervenor's contention and it is free to allege any intention it thinks it can prove.

Palmetto 16 is similar to 15, except that it refers to the public health and safety aspects of used fuel storage and transportation at Catawba. This contention is also conditionally admitted.

Contentions 15 and 16 are being admitted conditionally at this juncture. The Board will consider revision of these contentions in light of the information we receive in response to our questions.

Palmetto 21: This generally-worded contention charges the Applicants with failure to develop certain procedures required by NUREG-0737 in response to the Three Mile Island accident. The Applicants respond that they have submitted certain analyses to the Commission Staff and that the Staff is currently evaluating certain "emergency procedures." However, the section of the FSAR referenced by the Applicants (Section 1.9) says only that they are "in the process of developing new procedures." It does not say what those procedures are. In these circumstances, the Intervenor cannot be faulted for filing a non-specific contention. This contention is admitted conditionally. The Applicants are directed to supply to Palmetto a copy of their proposed procedures for complying with these TMI requirements, now or as soon as they are available. Palmetto is thereafter required to provide a revised and acceptably specific contention or to withdraw this contention.

Palmetto 22: This contention concerns two matters. The first is an alleged absence of sufficient instrumentation to detect inadequate core cooling. This part of the contention is denied. Section 1.9 (pp. 10-11) of the FSAR contains a description of such instrumentation and Palmetto does not specify any deficiencies in this description or even refer to it. The final sentence of the contention addresses the interaction of human factors and efficiency of operation. This part is admitted conditionally pending availability to Palmetto of the review of the control room design by the Applicants (Section 1.9-(3) of the FSAR). Thereafter the contention will be withdrawn or be stated in more detail.

Palmetto 24: This contention about the ability of the small owners of the facility to produce the funds necessary to operate it safely is admitted, subject to deletion of the next to the last sentence beginning with the phrase "An accident with . . ." As pointed out by the Staff, Commission regulations on financial qualifications do not require applicants to demonstrate capability to absorb the costs of severe accidents. The Staff's argument that the contention is not sufficiently specific is not well taken. The Applicants' attempt to equate this contention with CESG's Contention

22 fails; the latter contention (which we are rejecting) does not refer to the possible financial vulnerabilities of small owners.

Palmetto 25: This contention about costs of decommissioning is similar to the prior contention; it is admitted subject to deletion of the last paragraph, and subject to further specification following discovery.

Palmetto 26: It is unclear to the Board whether or to what extent the South Carolina Department of Health and Environmental Control will be responsible for monitoring the operational effects of Catawba, either as a matter of Commission safety regulations or as a factor in the environmental cost/benefit analysis. Various aspects of monitoring activities are discussed in detail in Chapter 6 of the Environmental Report, including a brief description of a pre-operational monitoring program by the South Carolina Department of Health and Environmental Control. Because this contention is not tied in with this discussion and is objectionable on specificity grounds, it is disallowed, with one possible exception. The contention also refers to the State agency's "responsibilities in the event of an emergency." Because the off-site emergency plans are not yet available, we do not know what role the agency may plan in an emergency. Accordingly, this limited aspect of the contention is admitted conditionally, until those plans are available and pending its revision or withdrawal.

CESG Contentions 8, 9, 13 and 16 and 17¹³ are admitted, in whole or in part, subject to the following conditions:

CESG 8 (Palmetto 35): The first sentence of this emergency planning contention is premature because the ten mile plume exposure pathway emergency planning zone has not yet been drawn by State and local officials. This portion of this contention is admitted, subject to the Intervenor's reviewing the State and local plans when they are available as to the appropriateness of that EPZ boundary. The second sentence alleges that a "radius of 30 miles should be the basis for emergency planning." We read this to mean that the plume exposure pathway EPZ prescribed in the rule as "about ten miles" should be expanded to 30 miles in the circumstances of this case. This is an impermissible attack on the Commission's rule (10 CFR 50.47(c)(2)). Should the Intervenor wish to pursue this matter, the proper course would be to file appropriate papers seeking a waiver of the ten-mile feature of the rule, pursuant to 10 CFR 2.758.

CESG 9: The first sentence of this contention is similar to Palmetto Contention 2; both seek consideration of serious accidents in the Staff's environmental impact statement. This contention is admitted conditionally, subject to its being revised or withdrawn in light of the draft environmen-

¹³ These same contentions are also advanced by Palmetto as their contentions numbered 35, 36, 40, 42 and 43. These Palmetto contentions are also admitted, subject, of course, to the same conditions.

tal impact statement's discussion of serious accidents. We do not, by this conditional admission, necessarily endorse the need to consider the entire spectrum of PWR accidents; the scope of the Staff's obligation is basically contained in the Commission's Policy Statement. The second sentence of this contention is rejected. The abilities of local officials to cope with the consequences of serious accidents would be more appropriately explored in the emergency planning context. New contentions concerning the functions and capabilities of local officials can be submitted promptly after the local area plans become available.

CESG 13: This contention alleging irregularities in welding practices is similar to Palmetto Contentions 6, 7 and 18. It is admitted conditionally, subject to further specification, or withdrawal, following discovery. The conference transcript indicates that further specificity could be provided. Tr. 348-350.

CESG 16: This contention is similar to parts of Palmetto Contention 22. It is quite vague as drafted. However, it is being admitted conditionally, subject to further specification or withdrawal after the Applicants have supplied to CESG a copy of the control room design review promised in Section 1.9-1(3) of the FSAR.

CESG 17: This contention lacks specificity in that it fails to state how an infestation of the Asiatic clam *Corbicula* might affect the performance of the cooling tower system and why such an effect should be of health and safety concern or impact the environment. The potential for *Corbicula* infestation was brought out in the FES (p. 2-36) at the construction permit stage. However, the Applicants do not refer in their pleading to any discussion of *Corbicula* in their FSAR or ER. In these circumstances, we admit this contention conditionally, subject to clarification of the issue and much greater specificity following discovery.

Palmetto Contentions Rejected.

Palmetto 5: This diffuse contention expresses a generalized concern about serious accidents at Catawba. It questions the use of the Reactor Safety Study in accident analyses, and contends that serious accidents (presumably at reactors generally) are "plainly credible" after Three Mile Island. This proposed contention falls short of specificity requirements, whatever standard one applies. There is no nexus of any kind, direct or indirect, between the very generalized concerns being expressed and the specific licensing actions we are considering. The possibility of accidents at a particular reactor can only be meaningfully analyzed with reference to specific scenarios and the design of that particular facility. Were Palmetto to postulate a specific serious and credible accident scenario at Catawba, we might accept a contention based upon it. *Cf. Public Service Co. of*

Oklahoma (Black Fox Station), CLI-80-8, 11 NRC 433 (1980). In the absence of such a credible scenario, this contention must be rejected.

Palmetto 9 and 31 (CESG 2): These contentions address an explosive hydrogen-oxygen reaction produced within the reactor containment following a loss-of-coolant accident. As held in *Sacramento Municipal Utility District* (Rancho Seco Nuclear Generating Station), ALAB-655, 14 NRC 799, these contentions are denied because the issue is being addressed in the rulemaking process. As recently as December 23, 1981 (46 Fed. Reg. 62281), the Commission published a proposed rule for comment. It is recognized, however, that hydrogen issues may be litigated in individual licensing proceedings provided the challenger postulates a credible scenario for a loss-of-coolant accident producing hydrogen. Absent such a scenario and in view of the pending rulemaking, these contentions are rejected.

Palmetto 11: This contention seeks to inject increased costs of construction into the environmental cost/benefit analysis at the operating license stage. The second sentence makes it clear that it is an attempt to reopen the cost/benefit analysis conducted at the construction permit stage. While construction costs can be significant at the construction permit stage when it comes to choosing among alternatives, they are usually irrelevant at the operating license stage. In the first place, costs of construction of all power plants have risen sharply in the past several years. The costs of the benefits associated with building a plant have also risen. No claim is made that the costs of construction of Catawba have risen any faster than those of other nuclear plants, or of other goods and services in the economy. More fundamentally, the attempt to inject increased costs into the cost/benefit equation at the operating license stage simply comes too late. Even assuming that the costs of construction of Catawba have gone up an inordinate amount, the fact remains that those funds have already been spent or are committed at this late stage of construction. Thus there is no practical point in considering such "sunk" costs now. *Cf. Public Service Co. of New Hampshire* (Seabrook Station), CLI-77-8, 5 NRC 503, 530-536 (1977).

Palmetto 12: This contention states that capital-intensive forms of energy (presumably including nuclear power plants) place added burdens on a tight capital market and increase interest rates in the economy as a whole. This may or may not be true. However, exploration of this broad economic thesis is far beyond the relatively narrow scope of this proceeding. The argument would be more appropriately put to an economic committee of the Congress.

Palmetto 13: This contention about the effect of Catawba on the area labor market is also beyond the scope of this operating licensing proceeding. We are concerned with whether the Catawba nuclear power plants meet the safety rules of the NRC and whether their benefits will outweigh the environmental costs of operation. We are not concerned, at least at this

juncture, with the number of jobs Catawba creates, either as a construction project or as an operating facility, and, by comparison, how many jobs investments in conservation might have created had Catawba not been built.

Palmetto 19 and 45 (CESG 19): These contentions address the Catawba Emergency Core Cooling System. 10 CFR Part 50, Appendix K. Palmetto 19 first alleges that the expected performance of the system has not been correctly predicted and in support cites what are described as published criticisms of the methodology embodied in the analysis put forth in the Commission's Reactor Safety Study (WASH-1400). Additionally, Palmetto 19 together with Palmetto 45 and CESG 19 allude in an unclear manner to a part of the reactor and allege that part is so poorly supported as to, in the limit of complete support failure, result in blockage of ports provided for entrance of emergency cooling water for the reactor core. The contention is so unclearly stated, even in the oral presentation (Tr. 179 ff, 362), as to preclude identification of the item of equipment under discussion. Therefore, both as a challenge to Commission regulations for emergency core cooling and as a collection of unclear statements lacking specifics on equipment, these contentions are rejected.

Palmetto 20: This contention postulates that occupational radiation exposures will not be as-low-as-reasonably-achievable (ALARA) because certain equipment (specifically the steam generator, the reactor vessel and neutron shield bolting) will require extensive repairs and because the FSAR does not adequately consider occupational exposure from various other occurrences that are not specifically described.

This contention is disallowed because it fails to provide any reasonably specific basis for the assertion that ALARA requirements of 10 CFR 20.1 will not be met. The Applicants have set forth in Section 12.1 of the FSAR their program for "(e)nsuring that occupational radiation exposures are as low as reasonably achievable (ALARA)." The contention, however, does not question this program or any part of it. Speculation that large collective doses of radiation might be received by repairmen at some future time because of the premature failure of equipment is not grounds for a showing that ALARA principles were ignored.

The Commission has under development, but has not yet published, a proposed rule concerned specifically with occupational ALARA. Should Palmetto Alliance wish to pursue the subject matter of this contention, participation in the making of the proposed occupational ALARA rule would be an appropriate avenue.

Palmetto 28: This contention seeks to raise "ATWS" (Anticipated Transients Without Scram) issues into this individual licensing proceeding. The thrust of the allegation is that the Applicants have failed to demonstrate that the risk from an ATWS event is such that there is a

reasonable assurance that the Catawba plant can be operated prior to the completion of the Commission's pending rulemaking on that subject. The Applicants in this case do not have the burden of making any such demonstration. The Commission has made these determinations, as stated in its recently initiated rulemaking:

The Commission believes that the likelihood of severe consequences arising from an ATWS event during the two to four year period required to implement a rule is acceptably small

On the basis of these considerations, the Commission believes that there is reasonable assurance of safety for continued operation until implementation of a rule is complete. 46 Fed. Reg. 57521.

It is clear from the quoted language that the Commission wishes to confine these generic issues to the generic rulemaking context. The Catawba facility will, of course, be subject to the outcome of the ATWS rulemaking.

Palmetto 29: Alluding to problems that have cropped up at other nuclear power stations, Palmetto Alliance asserts that the Applicants should go back to the drawing board and try to ferret out as yet unrecognized interactions of systems, particularly the control systems and plant dynamics, that could have impacts on health and safety of the general public. Palmetto Alliance makes no attempt to establish a nexus between the undefined systems interaction problems encountered at other reactors and Catawba, to identify the specific systems of concern, or to postulate the kind of impact that might endanger the safety and health of the general public. Consequently, this contention is much too vague to be admitted and is disallowed.

CESG Contentions Rejected.

CESG 1 (Palmetto 30): This contention seeks to inject the question of "need-for-power" into the proceeding. Such a contention is barred by a new rule, which provides in pertinent part that —

Presiding officers shall not admit contentions proffered by any party concerning need for power or alternative energy sources for the proposed plant in operating license hearings. 10 CFR 51.53(c). The supplementary information statements accompanying the proposed and final rules explicitly recognize that an exception to the rule may be sought upon a showing of special circumstances pursuant to 10 CFR 2.758. 46 Fed. Reg. 51776; 47 Fed. Reg. 12940.¹⁴

¹⁴ Our rulings on CESG Contentions 1, 5 and 12 are deferred and are to be effective upon the effectiveness of the new rule. That will occur 30 days following its publication in the *Federal Register* pursuant to 5 U.S.C. 553(d).

CESG 3 (Palmetto 32): This contention addresses the alleged inadequacy of the risk analysis by the Staff of operation and decommissioning of the Catawba station, and of the transport and storage of radionuclides produced there. The contention introduces a concept of "totality of risks" which purports to be a single number as a measure of a projected life-of-the-station effect on the public. Tr. 314-316. The contention does not include sufficient description of that concept to establish the feasibility of its determination. Even so, this is basically a generic issue. Whereas the contention is claimed to be site specific, completely absent are delineations of those characteristics of this site which bear upon the analyses and cause them, in some special manner, to entail investigation to a depth beyond that usually required by existing regulations. Accordingly the Board rejects this contention for lack of specificity.

CESG 5 (Palmetto 33): This contention alleges that the construction permit cost/benefit analysis has become defective and that the power to be produced by Catawba will be more expensive than a number of alternatives. This contention is also barred by the Commission's new rule (quoted in the discussion of CESG 1), which bars consideration of non-nuclear alternatives at the operating license stage.

CESG 6 (Palmetto 34): This contention represents yet another attempt to inject costs for Catawba and a resulting unfavorable cost/benefit ratio into this operating license proceeding. It also attempts to bring in need-for-power by claiming that earnings from Catawba will be "undeserved" because the facility is "unneeded." These issues are not relevant to the narrow focus of the cost/benefit analysis at the operating license stage.

CESG 10 (Palmetto 37): This contention calls for an "adequate crisis relocation plan" as a part of emergency planning. The phrase is not defined in the contention but it was made clear by CESG at the prehearing conference that "crisis relocation" means an area to which people could be moved permanently in the event of a nuclear disaster. Tr. 341. The Commission's emergency planning rules do not require establishment of such a permanent facility. Accordingly, this contention is an impermissible attack on the rules.

CESG 12 (Palmetto 39): This contention alleges that since the construction permit the Applicants have embarked upon a variety of programs designed to decrease load growth. The implication is that these actions have reduced need for power. As noted in discussion of CESG 1, however, the Commission's new rule bars consideration of need for power from operating license proceedings.

CESG 15 (Palmetto 41): This contention seeks to litigate the possible effects of an electromagnetic pulse (EMP) on Catawba. It is disallowed. An electromagnetic pulse of the type described by petitioners is generally postulated to result from the detonation of a nuclear weapon at high

altitude as an act of war. Petitioners do not contend otherwise or suggest how an EMP affecting the Catawba plant could be produced by other than a hostile act. Consequently we view this contention as an impermissible challenge to Commission regulation 10 CFR 50.13 and concur with the action taken on a similar contention by the Licensing Board for the Perry facility. *Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant), 14 NRC 842. See *Siegel v. AEC*, 400 F.2d, 778 (C.A.D.C. 1968).

CESG 18 (Palmetto 44): This contention is disallowed for lack of the requisite specificity. There is no claim that components of the Catawba reactors do not meet reference temperature requirements. Section 5.3.1.5 of the FSAR and Tables 5.3.1-4 and -5 show how the Catawba pressure vessels will comply with the fracture toughness requirements of 10 CFR Part 50, Appendix G. The contention makes no reference to this showing. Moreover, no link is established between temperature and "reactor embrittlement." Finally, even assuming there is a problem at the Oconee Unit, the contention does not link Oconee with Catawba. In sum, this contention does not contain a sufficiently clear statement to put the Applicant and Staff on notice of the crux of the Intervenor's concern.

CESG 20 (Palmetto 46): Petitioners are concerned that the drinking water of communities downstream from Lake Wylie will become contaminated by radioactive materials accidentally released from Catawba. The release of concern is postulated to result from "an accident such as happened at Oconee," or from "— any one of a variety of as yet unencountered operational errors." The Oconee reactor is of a substantially different design than Catawba and the unsupported assertion that a similar accident could occur at Catawba is, at best, very tenuous. We note that the FSAR includes detailed discussions of the proposed Catawba liquid radwaste system, including analyses of possible accidents and their effects. See Sections 3.5, 5.2, 11.2 and 15.7. This contention should, at the least, reflect an awareness of these discussions. The vagueness of this contention provides no basis for arguments about the source or nature of the radioactive materials, how they might reach Lake Wylie, or on the magnitude of the additional exposure that might ensue to people downstream who drink the water. Consequently, this contention does not meet the requirements of 10 CFR 2.714(b) and is disallowed.

CESG Contention 21 (Palmetto 47): This contention asserts that the Applicants' Environmental Report is deficient in respect to the consideration of some radioactive sources and to the water exposure pathway. The Commission's Staff is very explicit about the content of environmental reports. Section 3.5.1 of Reg. Guide 4.2 (NUREG-0099) specifies the source terms (including tritium) that are to be included. Section 5.2.1 of Reg. Guide 4.2 specifies the exposure pathways (including water) that must, as a minimum, be covered. Further, Reg. Guide 1.109 provides

detailed guidance for the calculation of radiation doses from both liquid and atmospheric pathways.

In this instance, Intervenors have had an opportunity to study the Environmental Report which is the particular document in contention. This document does, in fact, contain the type of information alleged to be missing. See Sections 3.5.1.1.4, 5.2.4.1, 5.2.4.2. If some specific sections or tables of the report are believed to be deficient the contention should have specifically identified them. This contention is disallowed for lack of specificity.

The Commission fulfills its obligations under the National Environmental Policy Act, in part, by the issuance of its own environmental assessment and environmental statements. Environmental reports prepared by applicants (sometimes found to be deficient) are major source documents used by the Commission's Staff. When the Staff's draft environmental statement for Catawba is issued, Intervenors will have an opportunity to study it and to submit comments about any item of concern, including source terms, environmental pathways, and health effects. However, any additional contentions on this subject will have to be based on new information.

Contention 22 (Palmetto 48): The first sentence of this contention about dilution of ownership refers to "responsibility and liability," but it does not say for what. We have admitted Palmetto Contention 24, which addresses the ability of the small owners to produce the funds needed to operate the plant. This contention may overlap that contention, but it seems to add nothing of substance.¹⁵ The remainder of this contention must also be disallowed because it does not raise any issue properly cognizable in an operating license proceeding. The NRC is not concerned with whether purchasers of nuclear generating capacity enter into unfavorable agreements.

The Security Plan.

Palmetto Contention 23 alleges in general terms that the Applicants have not developed and demonstrated an adequate security plan. The contention does not point to any particular deficiencies presumably because, as the Applicants point out, "the security plan is protected under the Commission's regulations (10 CFR 2.790), and is not available for inspection." Applicants' Response, p. 78. The Applicants go on to argue that Palmetto nevertheless "must frame [a sufficiently specific] contention

¹⁵ We will consider later on whether allowance of substantially similar contentions by two or more intervenors should lead to consolidation of their presentations on that contention.

on information available to it," this despite the fact that, by hypothesis, no information about the plan is available. We reject that argument.

In the instances of unavailable information discussed so far, we expected the problem to be resolved later when the relevant documents become publicly available. Here, however, unless ordered by the Board, the Catawba security plan will remain unavailable to the Intervenor.

Because an intervenor cannot reasonably be required to advance specific contentions about a security plan he has never seen, and because Palmetto has expressed a formal interest in the Catawba plan, we believe we could at this juncture order the Applicants to grant Palmetto access to that plan. We could now find that disclosure of the plans is "necessary to a proper decision in the proceeding." 10 CFR 2.744(e), as recently amended, 46 Fed. Reg. 51718, 51723. However, we are uncertain whether Palmetto is fully aware of the procedural complexities and costs associated with pursuing security plan issues under the Commission's case law and new regulations. For one thing, we would condition a disclosure order on Palmetto having obtained the services of a qualified security plan expert. Beyond that, access would be conditioned as to time, place, note-taking, and the like. A copy of the protective order entered in the *Diablo Canyon* case is enclosed as illustrative of these restrictions. A copy of the new security plan regulations is also enclosed [46 Fed. Reg. 51718 - 51726].

A logical next step, then, is for Palmetto to consider the matter further and inform us, within ten days of receipt of this Order, whether it wishes to gain access to the Catawba security plan, subject to the kinds of conditions we have indicated. If it wishes to proceed, we will then hear from the other parties and consider what further procedures are appropriate.

Service of Documents.

During the prehearing conference Palmetto complained that they had had only limited access to the Applicants' FSAR and Environmental Report and that their ability to formulate contentions had been significantly hampered. Palmetto anticipated that they would have further difficulties of that nature unless documents yet to come — particularly amendments to FSAR — were served upon them. The Applicants rejected these complaints. Without attempting to resolve these disagreements, the Board suggested that Palmetto make a motion that henceforth the Intervenor be served with copies of all relevant documents generated by the Applicants and the Staff in connection with this operating license proceeding. This would include, most significantly, amendments to the FSAR, other formal technical exchanges between the Applicants and Staff, emergency plans generated by State and local authorities, the draft and final

environmental impact statements, and the Staff's Safety Evaluation Report, as supplemented.

The Board believes that it would not significantly burden either the Staff or the Applicants to serve a copy of the papers they generate in the future on the Intervenor. This is suggested by the fact that the Staff and some applicants have provided such service in some past cases. In the case of a particularly bulky document which the Applicants or the Staff believe will not be viewed important by the Intervenor, the Applicants or Staff may seek the permission of the Board Chairman to serve only one copy of the document on one lead intervenor. In such a case, the Intervenor would be expected to consult with one another and to share access to that document. With that narrow exception, however, the Board grants Palmetto's motion for service of documents on all intervenors in this case.

Discovery and Schedule for Further Proceedings.

Discovery is to commence as of the date of this Order. The scope of discovery is to be confined to the contentions we have admitted either conditionally or unconditionally.

The following filing dates are established by this Order:

Page of Order	Matter	Filing Date
574-575	Discovery on Contentions 6, 7, 18 and 25 (Palmetto) and 13 and 17 (CESG)	June 3 (for last answers to interrogatories)
574-575	Revisions of above contentions	July 6
574-575	Revisions of contentions presently non-specific for lack of information	30 days after receipt of relevant document
574-575	New contentions based on new information	30 days after receipt of information
580	Information and comments on spent fuel questions	March 26
577-578	Comments on operator qualifications questions	March 26
589-590	Whether Palmetto wishes to pursue their security plan contention	10 days after receipt of this Order

The schedule for other matters will be considered and established by the Board following receipt of scheduling suggestions from the parties, as discussed at the Prehearing Conference. Tr. 372-73.

Orders of this kind are governed by 10 CFR 2.751a(d), which provides in pertinent part that —

Objections to the order may be filed by a party within five (5) days after service of the order, except that the regulatory staff may file objections to such order within ten (10) days after service. The board may revise the order in the light of the objections presented and, as permitted by §2.718(i), may certify for determination to the Commission or the Atomic Safety and Licensing Appeal Board, as appropriate, such matters raised in the objections as it deems appropriate. The order shall control the subsequent course of the proceeding unless modified for good cause.

In view of the number and complexity of contentions in this case, the Applicants and the Intervenors may mail their objections to this Memorandum and Order no later than March 26, 1982. Any Staff objections shall be mailed by April 2, 1982.

**THE ATOMIC SAFETY AND
LICENSING BOARD**

**James L. Kelley, Chairman
ADMINISTRATIVE JUDGE**

**Dr. A. Dixon Callihan
ADMINISTRATIVE JUDGE**

**Dr. Richard F. Foster
ADMINISTRATIVE JUDGE**

Dated at Bethesda, Maryland,
this 5th day of March, 1982.

Enclosures:

1. Diablo Canyon protective order
2. Recent NRC regulations on security plans

[Enclosures 1 and 2 have been deleted from this publication, but may be found in the NRC Public Document Room, 1717 H Street, Washington, D.C. 20555.]

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Marshall E. Miller, Chairman
Dr. Kenneth A. McCollom
Dr. Richard F. Cole

In the Matter of

Docket Nos. 50-445
50-446

(Application for Operating License)

TEXAS UTILITIES GENERATING
COMPANY, *et al.*
(Comanche Peak Steam
Electric Station, Units 1
and 2)

March 5, 1982

The Licensing Board denies intervenor's request that it adopt certain of intervenor's contentions as its own, and grants Applicants' motion for summary disposition of the contentions.

RULES OF PRACTICE: SUMMARY DISPOSITION

Where intervenor filed neither an answer opposing Applicants' motion for summary disposition of certain contentions, nor a statement of material facts as to which it contended that there existed a genuine issue to be heard, and where extensive affidavits and statements filed by the Applicants and the Commission Staff in support of the motion demonstrated that no such issue existed, intervenor's request that the Board adopt such contentions as its own would be rejected. If a party has established its entitlement to summary disposition of a contention, it would distort the Commission's regulations to abort this result by permitting an opposing party to withdraw the contentions without prejudice.

RULES OF PRACTICE: SUMMARY DISPOSITION

Motions for summary disposition under §2.749 of the Commission's Rules of Practice are analogous to motions for summary judgment under Rule 56 of the Federal Rules of Civil Procedure and Federal Court decisions interpreting that rule may be relied upon in NRC proceedings.

ORDER

(Granting Summary Disposition of Contentions 2 and 7)

On January 26, 1982, the Applicants, pursuant to the provisions of 10 CFR §2.749, filed their motion for summary disposition of Contentions 2 and 7. Those contentions had been admitted as issues pleaded by Citizens for Fair Utility Regulation (CFUR). The Applicants' motion was supported by detailed affidavits of Chun-Mong Jan, Arthur C. Spencer, William R. Spezialetti, C. H. Gatchell, Raymond C. Mason, Ralph E. McGrane, John T. Merritt, and P. M. Milam. A statement of material facts as to which there is no genuine issue to be heard was also filed by the Applicants (10 CFR §2.749(a)).

By our Order Subsequent to the Prehearing Conference of April 30, 1980, entered on June 16, 1980, Contentions 2 and 7 were admitted when framed as follows:

"Contention 2: One or more of the reports used in the construction of computer codes for the CPSES/FSAR have not been suitably verified and formally accepted; thus conclusions based upon these computer codes are invalid.

"Contention 7: Applicants have failed to adequately evaluate whether the rock overbreak and subsequent fissure repair using concrete grout have impaired the ability of category I structures to withstand seismic disturbances."

The Staff filed its answer supporting the Applicants' motion for summary disposition of Contentions 2 and 7 on February 12, 1982. The Staff submitted that its attached affidavits¹ together with its SER (NUREG-0797) and supplements Nos. 1 and 2 thereto, demonstrated the absence of any genuine issue of material fact and warranted summary disposition as a matter of law.

The Intervenor CFUR has not filed an answer opposing the motion for summary disposition, nor a statement of material facts as to which it is contended that there exists a genuine issue to be heard (10 CFR §2.749).

¹ Affidavits were filed by Jai Raj N. Rajan, John S. Berggren, Sammy S. Diab, Thomas G. Dunning, Barry J. Elliot, Joseph J. Holowich, James E. Knight, Ralph O. Meyer, David H. Shum, Robert C. Stewart, Owen Thompson, Frank Rinaldi and John P. Matra.

However, the Board was informed by telephone on February 8, 1982 that for financial reasons CFUR was withdrawing all of its remaining contentions. Accordingly, an Order was entered February 9, 1982 cancelling an evidentiary hearing scheduled to consider CFUR's contentions, and indicating that the Board would await CFUR's written filing regarding its withdrawal before determining the appropriate disposition of CFUR's contentions.

A written "motion for voluntary withdrawal of Contentions 2, 3, 5 and 7" was filed by CFUR on February 23, 1982. However, CFUR also stated therein that it "respectfully prays that it be allowed to voluntarily withdraw its status as an Intervenor party and that this Board, rather than dismissing CFUR's Contentions Two, Three and Seven, adopt said contentions as their own" (CFUR Motion, p. 2). The Board rejects CFUR's request for it to adopt Contentions 2 and 7 as its own. Once a motion for summary disposition has been made and supported by affidavits, the opposing party may not rely upon mere allegations or statements of concern, but rather must demonstrate by affidavit or otherwise that a genuine issue exists as to a material fact.² If a party is otherwise entitled to summary disposition, it would distort our regulations to abort this result by permitting an opposing party simply to withdraw the contention without prejudice. CFUR's statement of concerns, in which "[n]o attempt is made to categorize the following problems according to the respective contentions," will be dealt with by the Board in a subsequent order.

Motions for summary disposition under Section 2.749 are analogous to motions for summary judgment under Rule 56 of the Federal Rules of Civil Procedure, and Federal court decisions interpreting that rule may be relied upon in NRC proceedings.³ To defeat a motion for summary disposition, an opposing party must present facts in an appropriate form. Conclusions of law and mere arguments are not sufficient.⁴ The asserted facts must be material and of a substantial nature,⁵ not fanciful or merely suspicious.⁶ A party cannot go to trial on the vague supposition that

² Florida Power and Light Company (Turkey Point Nuclear Generating, Units 3 and 4), LBP-81-14, 13 NRC 677, 687 (1981); *aff'd.* ALAB-660, 14 NRC 987 (1981).

³ Alabama Power Co. (Joseph M. Farley Nuclear Plant, Units 1 and 2), ALAB-182, 7 AEC 210, 217 (1974); Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2), LBP-74-36, 7 AEC 877, 878-79 (1974).

⁴ Pittsburg Hotels Association, Inc. v. Urban Redevelopment Authority of Pittsburg, 202 F. Supp. 486 (W. D. Pa. 1962), *aff'd.* 309 F. 2d 186 (3rd Cir. 1962).

⁵ *Egyes v. Magyar Nemzeti Bank*, 165 F. 2d 539 (2nd Cir. 1948); *Beidler and Bookmeyer v. Universal Ins. Co.*, 134 F. 2d 828, 831 (2nd Cir. 1943).

⁶ *Griffin v. Griffin*, 327 U.S. 220, 236 (1946); *Banco de Espana v. Federal Reserve Bank, 28 F. Supp. 958, 973 (S.D.N.Y. 1939) aff'd.* 144 F. 2d 433 (2nd Cir. 1940).

“something may turn up,”⁷ or on the mere hope that on cross-examination the movant’s evidence will somehow be discredited.⁸

In its recent Statement of Policy, the Commission directed licensing boards to use procedural tools available to expedite the hearing process, stating:

“In exercising its authority to regulate the course of a hearing, the boards should encourage the parties to invoke the summary disposition procedure on issues where there is no genuine issue of material fact so that evidentiary hearing time is not unnecessarily devoted to such issues.”⁹

In another aspect of the instant proceeding, the Commission further held that “given the availability of summary disposition procedures, the admission of a contention does not automatically require exploration of that contention at hearing.”¹⁰

The Appeal Board has also stated that “the Section 2.749 summary disposition procedures provide in reality as well as in theory, an efficacious means of avoiding unnecessary and possibly time-consuming hearings on demonstrably insubstantial issues . . .”¹¹ Accordingly, the admission of a contention “does not carry with it any implication that we view the contention to be meritorious” (*Id.*, at 549). As the Appeal Board recently observed, a hearing on each contention “is not inevitable,” but whether one “will be necessary wholly depends upon the ability of the intervenors to demonstrate the existence of a genuine issue of material fact respecting any of the issues they previously raised.”¹²

The Board has carefully reviewed the extensive affidavits and statements filed by the Applicants and the Staff in support of the motion for summary disposition. These filings show that there is no genuine issue as to any material fact concerning Contentions 2 and 7, within the meaning

⁷ 6 Moore’s Federal Practice 56.15(3).

⁸ *Radio City Music Hall v. United States*, 136 F. 2d 715 (2nd Cir. 1943); *Orvis v. Brickman*, 95 F. Supp. 605 (D. D.C. 1951).

⁹ Statement of Policy on Conduct of Licensing Proceedings, CLI-81-8, 13 NRC 452, 457 (1981).

¹⁰ *Texas Utilities Company, et al.* (Comanche Peak Steam Electric Station, Units 1 & 2), CLI-81-36, 14 NRC 1111; 1114 (1981).

¹¹ *Houston Lighting and Power Company* (Allens Creek Nuclear Generating Station, Unit 1), ALAB-590, 11 NRC 542, 550 (1980), *citing* *Virginia Electric and Power Company* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-584, 11 NRC 451, 463 (1980). *See also* *Mississippi Power and Light Company* (Grand Gulf Nuclear Station, Units 1 and 2), ALAB-130, 6 AEC 423, 426 (1973).

¹² *Philadelphia Electric Company, et al.* (Peach Bottom Atomic Power Station, Units 2 and 3), ALAB-654, 14 NRC 632, 634 (1981).

of 10 CFR §2.749. Accordingly, Contentions 2 and 7 are summarily dismissed.

It is so ORDERED.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

Marshall E. Miller, Chairman
ADMINISTRATIVE JUDGE

Dated at Bethesda, Maryland
this 5th day of March, 1982.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Marshall E. Miller, Chairman
Dr. Kenneth A. McCollom
Dr. Richard F. Cole**

In the Matter of

Docket Nos. 50-445

50-446

(Application for Operating License)

TEXAS UTILITIES GENERATING

COMPANY, *et al.*

(Comanche Peak Steam

Electric Station, Units 1

and 2)

March 8, 1982

The Licensing Board denies intervenor's motion for extension of time for discovery.

RULES OF PRACTICE: EXTENSIONS OF TIME

In light of the Commission's express direction that licensing boards conduct their proceedings at an expeditious pace consistent with the demands of fairness by setting and adhering to reasonable schedules; and that the special circumstances faced by a participant do not relieve that party of its hearing obligations; intervenor's motion for extension of time for discovery would be rejected where no good cause for that extension had been shown.

ORDER

Citizens Association for Sound Energy (CASE) filed a motion on March 1, 1982 seeking an extension of time for discovery concerning Contention 5. That contention relates to the Applicants' alleged failure to adhere to the quality assurance/quality control provisions required by the

Comanche Peak construction permits. The cutoff date for Contention 5 discovery is March 29, 1982. The motion for extension of time is denied.

CASE argues that circumstances have changed since the establishment of the cutoff date because CFUR has moved for its voluntary dismissal from the proceedings. However, on December 1, 1981 at a prehearing conference, the Board severed the prior consolidation of CFUR and CASE as to discovery on Contention 5.¹ CASE was therefore free to conduct its own discovery immediately on the facts involved in Contention 5, and all parties were urged to conclude discovery expeditiously. It was also ordered that discovery "shall commence immediately on all issues."² The Order establishing the March 29 cutoff date for discovery on Contention 5 was entered February 9, one day after the Board was advised by telephone of CFUR's withdrawal of all of its contentions. Consequently, there are no significantly changed circumstances which would justify any further extension of discovery time. The documents described in CASE's motion should be discoverable, if such discovery is appropriate, by March 29.

CASE seems to be under a misapprehension that there is an "early cutoff of discovery," or that this litigation is "premature" or "hasty". Such conclusions are grossly inaccurate. The Commission has expressly advised licensing boards in a Policy Statement to see "that the process moves along at an expeditious pace, consistent with the demands of fairness."³ As to CASE's problems as a citizen group, the Commission stated:

"While a board should endeavor to conduct the proceeding in a manner that takes account of the special circumstances faced by any participant, the fact that a party may have personal or other obligations or possess fewer resources than others to devote to the proceeding does not relieve that party of its hearing obligations."⁴

It further provided the following specific guidance to boards:

"The Commission expects licensing boards to set and adhere to reasonable schedules for proceedings. The Boards are advised to satisfy themselves that the 10 CFR 2.711 'good cause' standard for adjusting times fixed by the Board or prescribed by Part 2 has actually been met before granting an extension of time."⁵

In this proceeding, CASE has failed to show good cause for a further extension of time for discovery. At its own request, it was permitted to conduct independent discovery on Contention 5 after December 1, 1981. Ample time was established for this purpose and all parties were directed

¹ Tr. 101.

² Scheduling Order entered December 11, 1981, p. 2.

³ Statement of Policy on Conduct of Licensing Proceedings, CLI-81-8, 13 NRC 452, 453 (1981).

⁴ *Id.*, at 454.

⁵ *Id.*

to proceed expeditiously. Time remains for any further necessary discovery to be accomplished. However, according to monthly reports furnished by NRC to the Bevill Committee of Congress, an initial decision is scheduled to be entered by this Board in September, 1982.⁶ It is obvious that to comply with this schedule an evidentiary hearing must be scheduled soon, with imminent cutoff dates for discovery, motions, trial briefs and prefiled testimony. All parties must therefore proceed expeditiously to comply with the Commission's planning guidance "which urged Boards to take firm hold of hearings and keep them moving."⁷

Accordingly, CASE's motion for extension of time for discovery on Contention 5 is denied.

It is so ORDERED.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

Marshall E. Miller, Chairman
ADMINISTRATIVE JUDGE

Dated at Bethesda, Maryland
this 8th day of March, 1982.

⁶ Fifteenth report by NRC to the Honorable Tom Bevill, Chairman, Subcommittee on Energy and Water Development, Committee on Appropriations, United States House of Representatives, dated January 29, 1982, Table 1, page 1.

⁷ U. S. Nuclear Regulatory Commission Policy and Planning Guidance 1982, NUREG-0085, Issue 1, page 4.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Lawrence Brenner, Chairman
Dr. James H. Carpenter
Mr. Frederick J. Shon

In the Matter of

Docket Nos. 50-322-OL
50-322-CPA

**LONG ISLAND LIGHTING
COMPANY**
**(Shoreham Nuclear Power
Station, Unit 1)**

March 15, 1982

The Licensing Board rules on the admissibility of contentions and confirms establishment of hearing schedule.

OPERATING LICENSE HEARINGS: TMI-RELATED ISSUES

TMI related issues may be litigated in individual proceedings even if they are not included in the NUREG-0737 list of TMI requirements applicable to new operating licenses provided that the issue to be litigated is not a challenge to the existing regulations. The Commission's Revised Statement of Policy for litigation of TMI issues, CLI-80-42, 12 NRC 654 (1980), broadened the range of TMI issues which could be litigated in individual proceedings to include the requirements contained in NUREG-0737, whether or not those requirements might have been considered challenges to the regulations. The policy statement did not cut back the pre-existing right to litigate issues which do not challenge the regulations just because those issues are not included in NUREG-0737. *Pacific Gas and Electric Company* (Diablo Canyon, Units 1 and 2), CLI-81-5, 13 NRC 361, 363 (1981).

ADMISSIBILITY OF CONTENTION: CLASS 9 ACCIDENTS

The Commission's "Class 9" accident interim policy statement, 45 Fed. Reg. 4010 (June 13, 1980), requires that a probabilistic assessment of environmental risk of accidents previously not considered within the design basis of nuclear power plants be included in Final Environmental Statements (FES) issued after the June 13, 1980 policy statement. However, this does not bar a contention in proceedings in which the FES issued before that date alleging that the Applicant and Staff have not applied an adequate methodology, such as a probabilistic analysis, to analyze the reliability of systems to determine which sequences of accidents should be considered within the design basis of the plant.

RULES OF PRACTICE: BURDEN OF GOING FORWARD

In the circumstance where a contention is a general inquiry into the plant design systems analysis methodology, with no specification of design examples, it is appropriate to require the intervenor to file and present its direct testimony first, in which intervenor may include a maximum of three design examples to support its allegation of inadequate methodology. The Staff and Applicant will file their responsive testimony after the cross-examination of intervenor's testimony. If the Board finds that the testimony of the parties, including that on any design examples discussed by intervenor's testimony, raises doubts about the methodology applied to the design of the plant, this could require the Applicant and the Staff to go forward with an expanded system-by-system analysis on the record of the proceeding.

ADMISSIBILITY OF CONTENTION: PENDENCY OF RULEMAKING

Where a generic issue has a direct bearing on the safe operation of the individual plant and the ability of that plant to meet present regulations, the issue cannot be put aside for resolution after the issuance of the operating license simply because it is the subject of an uncompleted generic rulemaking proceeding. In the absence of a finding by the Commission that it is acceptable for an individual license to issue while a rulemaking is pending, the board would either have to defer any authorization otherwise justified in the individual case until a determination is reached in the rulemaking proceeding and then factor that determination in, or be able to conclude that such authorization can be

granted in the individual case in advance of resolution of the issue on a generic basis. As in instances involving Unresolved Safety Issues, this latter determination could be premised on findings that the problem has been resolved for the individual reactor, or that there is reasonable assurance the problem will be resolved before it has adverse safety implications for the individual reactor, or that alternative means will be available for assuring that lack of resolution of the problem generically would not pose an undue risk from operation of the individual reactor. Cf. *Virginia Electric and Power Co.* (North Anna, Units 1 and 2), ALAB-491, 8 NRC 245 (1978); *Gulf States Utilities Co.* (River Bend, Units 1 and 2), ALAB-444, 6 NRC 760, 775 (1977).

**ADMISSIBILITY OF CONTENTION: ANTICIPATED TRANSIENTS
WITHOUT SCRAM**

Although the ATWS issue is pending before the Commission in a rulemaking proceeding, it is permissible to litigate a contention that the measures taken at a facility for the interim period pending completion and implementation of the rulemaking, including operational procedures and operator training, do not provide the level of protection required by the regulations.

**RULES OF PRACTICE: INTERVENTION BY GOVERNMENTAL
AGENCY**

A governmental agency, in this instance a County, which has elected to participate as a full intervenor on specified contentions does not lose its right to participate as an interested governmental agency on other issues in the case pursuant to 10 CFR §2.715(c). *Project Management Corporation* (Clinch River Breeder Reactor Plant), ALAB-354, 4 NRC 383, 392-93 (1976). However, such participation must be in accordance with the responsibilities imposed upon a §2.715(c) participant, including timeliness consistent with the need to prevent unfair surprise to the other parties in the proceeding. See *Gulf States Utilities Co.* (River Bend, Units 1 and 2), ALAB-444, 6 NRC 760, 768-70 (1977).

EMERGENCY PLANNING: SIZE OF EPZ

There is flexibility in the emergency planning rule, 10 CFR §50.47(c)(2), for adjustment of the general approximate 10 and 50 mile

Emergency Planning Zone (EPZ) where particular local conditions warrant adjustment. Therefore, contentions that such adjustments must be made due to specified local conditions would be admissible. However, contentions seeking a totally new case by case probabilistic accident risk analysis to determine on an ad hoc basis the zones to be established for the plume exposure pathway and ingestion pathway EPZ's are challenges to the rule since they would render meaningless the general specification in the rule of 10 and 50 mile EPZ's.

**EMERGENCY PLANNING: PERSONS OUTSIDE THE
APPROXIMATE 10-MILE EPZ**

A contention would be admissible which alleges that because of the geography of Long Island, evacuation planning within an approximate 10 mile EPZ may not be adequate because of the impacts of persons outside and to the east of the EPZ choosing to evacuate and having to do so by coming through the EPZ.

**MEMORANDUM AND ORDER
CONFIRMING RULINGS MADE AT THE CONFERENCE
OF PARTIES (REGARDING REMAINING OBJECTIONS
TO ADMISSIBILITY OF CONTENTIONS AND
ESTABLISHMENT OF HEARING SCHEDULE)**

This order confirms the Board's rulings made at the Conference of Parties held on March 9 and 10, 1982, with respect to the Shoreham operating license proceeding. Our ruling at the conference denying the request of the Shoreham Opponents Coalition (SOC) for a hearing on the Construction Permit extension amendment will be confirmed in a separate order. In some instances, the reasons in support of our rulings are set forth more fully in this order than in the record. Due to the desirability of issuing this order promptly, there may be certain filings which the parties were directed to make which are not confirmed in this order. In such instances, the record directives continue to have full force and effect.

**TMI Issues Allegedly Unresolved for Shoreham
(SOC Contentions 7B(1)-(4) and SC Contentions 6, 7, 29 and 30)**

Each of these four SOC contentions are either identical or similar to the four Suffolk County (SC) contentions, and each pair may be summarized together as follows:

SOC 7B(1) and SC 29 - IREP-Probabilistic Risk Assessment: By these contentions, intervenors contend that the need for plant specific safety

improvements at Shoreham to prevent and mitigate accidents beyond those previously considered by the old review, which excluded so-called "Class-9" accidents as beyond the "design basis accident" review, must be analyzed by LILCO and the NRC Staff. The contention further alleges that the analysis needed is the approach of the Interim Reliability Evaluation Program (IREP),¹ which applies probabilistic risk assessment (including event-tree and fault-tree logic) to a plant specific system to assess the reliability of systems which prevent or mitigate accidents and thereby to identify risk-dominant sequences, design weaknesses, and system modifications that could be made to improve the performance of the systems under various transient and LOCA events.²

SOC 7B(2) and SC 7 - Systems Interaction: While not identical, both contentions, in effect, allege that a systems interaction analysis of the Shoreham design must be performed to assure that all interactions of control and non-safety systems with safety systems have been considered when such interactions could cause or exacerbate an accident. SC 7 adds the allegation that physical inspection of separations between power and control cables is necessary to assess potential systems interactions detrimental to safety. SOC 7B(2) notes that systems interaction has been the subject of unresolved safety issue (USI) A-17 under NUREG-0606 "Unresolved Safety Issues Summary" (Aqua Book), as well as item I.I.C.3 of NUREG-0660.³

SOC 7B(3) and SC 30 - Documentation of Deviations: These identical contentions allege that neither the FSAR nor SER document and justify all deviations from current regulatory practices (*i.e.*, Regulatory Guides, Branch Technical Positions, and Standard Review Plans).

SOC 7B(4) and SC 6 - Classification and Qualification of Safety Equipment: Although not identical, in effect both contentions allege that in

¹ The IREP Program is discussed as item I.I.C.1 of NUREG-0660 ("NRC Plan Developed as a Result of the TMI-2 Accident").

² SC 29 only consists of the last paragraph of SOC 7B(1). That paragraph may be viewed as a summary of the action requested by the entire contention — the performance of an IREP analysis or what is termed a "simplified system reliability analysis." This paragraph and therefore SC 29, do not expressly discuss the need to consider accidents formerly placed in that unconsidered residuum known as "class 9 accidents." However, an important part of the underlying rationale in favor of such a systems reliability analysis is to attempt to identify whether there is a sufficient risk of such sequences for a plant so as to require changes (*e.g.*, in design, training, or operations).

³ This item, like IREP, is included within the overall item I.I.C category of Reliability Engineering and Risk Assessment. As noted in item I.I.C.3, the approach to systems interaction described there overlaps with IREP. As may be inferred from discussion of item I.I.C.3 in NUREG-0660, and as stated in NUREG-0606, Vol. 3, No. 3, at 26, the work originally planned under USI A-17 will now be performed under item I.I.C.3 of NUREG-0660.

the absence of a systematic event-tree/fault-tree accident sequence analysis for Shoreham there is no assurance that all equipment "important to safety" as used in GDC 1 has been properly classified and qualified (including being subjected to the Quality Assurance Standards of 10 CFR Part 50, Appendix B). SOC 7B(4) cites items I.F.1 and II.F.5 of NUREG-0660.⁴ SC 6 adds that the proper analysis would include a review of Shoreham's Emergency Operating Procedures to insure that all equipment relied upon in the procedures is properly classified and qualified.

Discussion

LILCO and the NRC Staff argue that none of the above contentions may be admitted because they are barred by the Commission's guidance on the extent to which issues arising out of the lessons learned from the Three Mile Island, Unit 2 accident ("TMI Issues") may be litigated in individual operating license proceedings. We disagree.

LILCO and the Staff are correct that the Commission approved the NUREG-0737 list of TMI requirements for application to new operating licenses, and that this list was culled from the larger list of TMI lessons learned which had evolved into the TMI task action plans published as NUREG-0660.⁵ However, they are clearly incorrect in their position that if a TMI related item is not included in NUREG-0737, it may not be admitted for that reason alone.⁶ Such a view would lead to odd results, is inconsistent with the Commission's rationale, and clearly is inconsistent

⁴ As noted in NUREG-0660 at I.F.1, this item involves applying the results of the IREP and systems interaction tasks to develop guidance to expand and rank the equipment included on QA lists. Item II.F.5 is a program to develop a generic standard classification of instrumentation, control and electrical equipment based on the level of their importance to safety.

⁵ [Revised] *Statement of Policy: Further Commission Guidance for Power Reactor Operating Licenses*, CLI-80-42, 12 NRC 654 (December 18, 1980) ("Revised Statement of Policy"). This revised statement superseded the earlier Statement of Policy of June 16, 1980 (45 Fed. Reg. 41738, June 20, 1980).

⁶ The Commission has published a proposed rule for comment which, if adopted, would make the substance of NUREG-0737 items part of the regulations (proposed new paragraph (f) to §50.34) for operating license applications. 46 Fed. Reg. 26491 (May 13, 1981). Since the Revised Statement of Policy has not been modified by the proposed rule, and that policy makes these items applicable to Shoreham, there would appear to be no difference created by the pendency or even adoption of the rule, at least in the absence of a challenge by LILCO to the necessity of a NUREG-0737 item. It may be that adoption of the rule could affect the present right of an intervenor, under the revised policy statement, to challenge the sufficiency of a NUREG-0737 item, depending on whether the particular circumstances involved would lead to the contention being viewed as a "challenge" to the new section 50.34(f) of the regulations. However that is not pertinent to our ruling on these contentions which do not raise matters in NUREG-0737. In any event, we need not decide the point with respect to Shoreham contentions unless and until the regulation is adopted and the revised Statement of Policy is superseded by it.

with the Commission's express additional guidance on this point in *Pacific Gas and Electric Company* (Diablo Canyon, Units 1 and 2), CLI-81-5, 13 NRC 361, 363 (1981).

We need not undertake a detailed analysis of the wording of the Revised Statement of Policy, which in our (unnecessary) view is wholly consistent with the Commission's further guidance in *Diablo Canyon, supra*, because the Commission has squarely addressed this point, as follows:

Parties are generally free to raise issues of compliance with NRC regulations, subject to 10 CFR 2.714 specificity and lateness requirements, where applicable, and standards for reopening records, where applicable. This holds true for TMI-related issues, and nothing in the Revised Policy Statement affects this. Thus, if a party comes forward on a timely basis with significant new TMI related evidence indicating that an NRC safety regulation would be violated by plant operation, we believe that the record should be reopened notwithstanding that the noncompliance item is not discussed in NUREG-0737⁷

Diablo Canyon, supra, at 363.

We have eschewed a detailed analysis of the Revised Statement of Policy as unnecessary in this instance in view of the opportunity to rely on the Commission's clear statement quoted above. However, it might be helpful to note why the position that a TMI related requirement may be litigated only if it is in NUREG-0737 misapprehends the rationale and meaning of the Revised (and indeed the original) Statement of Policy. Prior to the TMI policy statement, there were recommendations made in various documents of lessons learned from the TMI accident. Some of these recommendations could be implemented by interpretation, refinement or quantification of existing regulations — *i.e.*, improved recognition of actions necessary to meet existing regulations. Such issues addressing TMI related recommendations in terms of deciding whether existing regulations are met could of course always be litigated, from either direction (sufficiency or necessity of the requirements). Neither the original nor revised policy statement changed this.

Another category of TMI related recommendations could only be implemented by going beyond the requirements of the existing regulations because compliance with the existing regulations would not solve the

⁷ The last sentence of the quoted excerpt discusses a permissible allegation that an NRC regulation would be violated in terms of "significant" evidence only because, as is clear from the rest of the sentence, the posture in *Diablo Canyon* was one of deciding whether a closed record should be reopened.

problem disclosed by the particular lesson learned from TMI. The Commission recognized this category well before its original policy statement in its cautionary instruction that:

In reaching their decisions the Boards should interpret existing regulations and regulatory policies with due consideration to the implications for those regulations and policies of the Three Mile Island accident. In this regard it should be understood that as a result of analyses still underway the Commission may change its present regulations and regulatory policies in important respects and thus compliance with existing regulations may turn out to no longer warrant approval of a license application.

Suspension of 10 CFR 2.764 and Statement of Policy on Conduct of Adjudicatory Proceedings, (November 5, 1979) (44 Fed. Reg. 65049, at 65050, November 9, 1979), republished as Appendix B to 10 CFR Part 2.

The second sentence is no longer the part of the regulations. Presumably, at least in part, this is because the general caution that in light of the TMI accident compliance with existing regulations may no longer be sufficient has been superseded by the guidance of the Statement of Policy that requirements in NUREG-0737 are to be met even if they impose new requirements beyond the existing regulations.⁸

Under the policy statement, then, the Shoreham operating license application is to be measured by the NRC Staff, and as to contested issues by this Board, against the regulations as augmented by the requirements of NUREG-0737. Revised Statement of Policy, 5 NRC at 659.⁹

Our inquiry then cannot end with a finding that an issue is not within NUREG-0737.¹⁰ We must decide if such an issue is a challenge to the presently existing regulations.

⁸ The effect of this was similar to amending the regulations to include those NUREG-0737 items which would otherwise have been considered challenges to the existing regulations: Unlike regulations, however, without special Commission action Applicants could challenge the necessity of a "supplemental" NUREG-0737 requirement, and under the revised policy statement, intervenors could challenge the sufficiency of such a "supplemental" requirement. The Commission believes the number of "supplementary", as distinguished from "interpretive", requirements in NUREG-0737 to be quite small. 5 NRC at 655.

⁹ Commissioner (then Chairman) Ahearne dissented from the Revised Statement of Policy because he wanted the Commission to remain directly involved in deciding, through requests for certification on a case by case basis, whether an intervenor should be allowed to litigate the sufficiency of not going beyond the regulations (as augmented by the NUREG-0737 requirements). 5 NRC 662. This disagreement aside, Commissioner Ahearne's dissent is in full agreement with the majority on the point before us. He notes that a party should go through the Licensing Board to request certification of TMI matters going beyond the existing regulations in part because "the Board might rule that the issue is within the existing regulations rendering certification unnecessary" 5 NRC at 663, n.3.

¹⁰ We note further that such an approach would lead to the absurd result of applying a policy statement that was issued to expand the scope of a proceeding to include NUREG-0737
(CONTINUED)

LILCO and the Staff also assert that the IREP and Systems Interactions contentions are underlain by an insistence that so-called Class 9 accidents, beyond those previously considered for the design basis of the plant, be analyzed for Shoreham. They argue that such litigation is barred by the Commission's Statement of Interim Policy on consideration of Class 9 accidents under NEPA.¹¹ This Commission statement revoked the old proposed 1971 Annex to 10 CFR Part 51 (originally to 10 CFR Part 50, Appendix D) under which it was not necessary to include the environmental risk of Class 9 accidents in NEPA evaluations. The Commission's statement further included guidance for inclusion of the environmental evaluation of the risk (a combination of probability and consequences) of Class 9 accidents, but requires these new NEPA treatments only for proceedings in which a Final Environmental Statement (FES) has not issued as of the time of the interim policy statement — June 13, 1980. The Shoreham FES was issued long before this date, in October 1977.

It is clear under the policy statement that an environmental assessment of the risk of Class 9 accidents need not be performed for Shoreham. It is also clear that IREP probabilistic risk analysis is not required for Shoreham in the sense that failure to do one is not *per se* insufficient under the regulations. However, we see no bar to contentions such as those advanced here which allege that the previously applied methodology is inadequate for determining whether the design of the plant adequately protects from accident sequences which should be considered.

In the first instance, the contentions objected to as a challenge to the Commission's policy on treatment of Class 9 accidents are not solely directed to Class 9 accidents. We agree that an important part of the underlying thrust is the assertion that accident sequences beyond those previously considered for Shoreham may have to be considered and that this cannot be determined properly under the present allegedly inadequate analysis. However, even if we held that contentions seeking a systematic design analysis must draw the line at consideration of accidents beyond those previously considered design basis, the contentions could be admitted as so limited.

requirements whether or not they were outside the regulations so as to limit a hearing to issues related solely to NUREG-0737 issues. In some cases, including some of the four pairs of contentions before us, issues related to TMI also arose out of other matters predating TMI, e.g., unresolved safety issues. The Applicant's and Staff's position that NUREG-0737 contains the entire universe of TMI-related issues which may be litigated would result in now barring such issues, even though the issues could have been litigated before the policy statement and to some extent (although not with the benefit of the new lessons learned) even before the TMI accident.

¹¹ "Nuclear Power Plant Accident Considerations Under the National Environmental Policy Act of 1969," 45 Fed. Reg. 4010 (June 13, 1980).

More importantly, however, we do not read the Class 9 policy statement to bar the contentions. The allegations, as we construe them, are not that a full probabilistic assessment of environmental risk of Class 9 accidents (i.e., an envelope or range of risk of radiological doses and consequences) must be performed.¹² The contentions allege that under the design approach applied to Shoreham, there is no assurance that the plant systems design provides the protection from accident sequences required by applicable regulations, including the specified GDC in Appendix A to 10 CFR Part 50, will be met. Even the now revoked Annex provided for flexibility to show that accident assumptions other than those in the Annex "may be more suitable for individual cases."¹³ As basis, the contentions point to different techniques of systems analysis which in intervenor's view would provide a proper methodology, which are not being applied. In addition, the contentions note that potential systems interaction is an acknowledged consideration, partly because of TMI and partly because it is an unresolved safety issue, which must be taken into account as part of the systems analysis which allegedly should be performed. We note also that, as is obvious from our summary of the safety classification contention, it too is a part of the analysis which intervenors believe has been lacking.

We do believe that the contentions are too vague to put the parties or the Board on notice of which plant systems are inadequate and will fail to protect as designed due to reliance on improperly classified or qualified equipment, or due to failure to consider particular systems interactions. While there is sufficient basis to permit inquiries into LILCO's and the Staff's methodology of safety systems analysis, there is not at this time the basis for commencing, on the record of this proceeding, a system by system analysis or physical inspection¹⁴ on the mere possibility that a defect may turn up during consideration of the assumed failure modes and protective systems operations.

However, the contention pairs of SOC 7B(1) - SC 29, SOC 7B(2) - SC 7, and SOC 7B(4) - SC 6 may be combined as a contention going to the methodology or lack thereof used by LILCO and the Staff along the lines of our previous description, restated as follows:

¹² At the Conference of Parties, it appeared that SOC was now asking for this NEPA analysis also, in addition to an analysis more directly applied to assessing the systems design of the plant. If so, to this extent the contentions are barred by the Commission's implementation schedule for such a NEPA analysis in its Class 9 policy statement.

¹³ A full discussion of the historical treatment of Class 9 accidents may be found in *Metropolitan Edison Company* (Three Mile Island, Unit 1), LBP-79-34, 10 NRC 828, 832-35 (1979).

¹⁴ SC 7 in part alleges, again without specification as to particular systems, that electrical separations must be inspected as part of the needed systems analysis. Admitted contentions SOC 19(g) and SC 31 will involve litigation of physical independence of electrical cables and raceways.

LILCO and the Staff have not applied an adequate methodology to Shoreham to analyze the reliability of systems, taking into account systems interactions and the classification and qualification of systems important to safety, to determine which sequences of accidents should be considered within the design basis of the plant, and if so, whether the design basis of the plant in fact adequately protects against every such sequence. In particular, proper systematic methodology such as the fault-tree and event-tree logic approach of the IREP program or a systematic failure modes and effect analysis has not been applied to Shoreham. Absent such a methodological approach to defining the importance to safety of each piece of equipment, it is not possible to identify the items to which General Design Criteria 1, 2, 3, 4, 10, 13, 21, 22, 23, 24, 29, 35, 37 apply, and thus it is not possible to demonstrate compliance with these criteria.

As stated, this contention shall be SOC and SC 7B, replacing the three pairs of contentions noted.

Such a contention, which we find fairly restates the contentions, would be a general inquiry into the methodology used by LILCO and the Staff to determine whether there is reasonable assurance that the Shoreham design adequately protects from credible accidents. The mere listing of all the key plant systems, in the last paragraph of 7B(1) and in SC 29, taken from generic documents, does not provide a basis for requiring detailed testimony from LILCO and the Staff analyzing or inspecting all the systems. Similarly, the assertion in SC 6 that the turbine control system causes transients and therefore should be in a safety classification so as to be subject to QA requirements does not provide a basis for testimony from LILCO or the Staff analyzing whether the turbine control systems should be reclassified.

Although we have viewed the contentions as going to the general methodology (if viewed as asking for a substantive system-by-system analysis or inspection they would have been too vague and without adequate basis), a problem arises in that one useful way to test the methodology would be an examination of its application to a particular system. Accordingly, if intervenors wish to use this approach as part of their evidence, they must, in their direct combined presentation of testimony, discuss a maximum of three examples of plant design which in their view illustrate the inadequacy of the methodology as alleged in the restated contention. Intervenor's testimony shall be filed on the April 13 testimony date, and will be the first testimony presented in the evidentiary hearing. LILCO, and the NRC Staff need not file any direct testimony (which will include rebuttal testimony) until after intervenors' testimony is presented. LILCO and the Staff will be required, regardless of intervenors' testimony, to

address the restated contentions by explaining their methodology and why they believe it is adequate. In addition, any specific design examples raised by intervenors' testimony will be addressed in the testimony of LILCO and the Staff. If, after considering the proposed findings of the parties (or perhaps earlier) the Board finds that the testimony, including any of intervenor's examples, raises doubts about the methodology applied by LILCO and the Staff, this could require LILCO and the Staff to go forward with an expanded system-by-system analysis on the record of this proceeding.

SOC Contention 7B(3) - SC 30 (regarding documentation of deviations) may be viewed separately from the other three pairs of contentions. We find it inadmissible as being too vague. This is consistent with our previous ruling on SOC 19.¹⁵ Intervenors must point to particular deviations which they believe have not been justified. Otherwise, there is no notice of what would be litigated, and no ability by us to examine the basis for the particular factual contentions. If viewed merely as a legal contention that such a listing of deviations is required, we find that it is not. Although it may be convenient to have such a uniform listing for all facility applications, and it may be required for future applications under a proposed rulemaking, 45 Fed. Reg. 67099 (October 10, 1980), it is not now required. Unlike the other three pairs of contentions, the absence of doing what is asked for by the contention presents no basis to contend that therefore the regulations will not be met.

Contention SC-16 ATWS:¹⁶

The Contention states:

Suffolk County contends that LILCO and the NRC Staff have not adequately demonstrated that Shoreham meets the requirements of 10 CFR 50, Appendix A, GDC 20, regarding correction of the anticipated transients without scram (ATWS) problem.

As further amplified in the County's response, it contends that because the Shoreham standby liquid control system ("SLCS") is not automatically initiated, is not totally redundant and does not meet the single failure criterion, the plant design does not meet GDC 20.¹⁷

¹⁵ Order Ruling on Petition of Shoreham Opponents Coalition, at pp. 22-23 (unpublished) (March 5, 1980).

¹⁶ This contention was discussed at Tr. 218-238 and admitted as clarified at Tr. 495-97.

¹⁷ GDC 20 states:

Protection system functions. The protection system shall be designed (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and to initiate the operation of systems and components important to safety.

As clarified, the contention is specific in alleging a current safety requirement is not met. Applicant objects that we may not consider the contention because there is a generic rulemaking proceeding on ATWS before the Commission. Indeed, we note that one of the options being considered by the rulemaking is whether to require automatic initiation of the SLSC for Boiling Water Reactors (BWRs).

We agree with Applicant's application of the *Douglas Point* and *Rancho Seco*¹⁸ cases only to a limited extent. Where a generic matter is in rulemaking and will have little if any effect in the interim on the licensing of the individual plant, then there is no harm in issuing a license even if the rulemaking is not resolved. However, where a generic issue has a direct bearing on the safe operation of the individual plant and the ability of that plant to meet present regulations, the issue cannot be put aside for resolution after the issuance of the license simply because it is the subject of an uncompleted generic rulemaking proceeding. To do so would permit blanket exemptions from the regulation without underlying supporting findings for all plants which could fortuitously be licensed while a rulemaking proceeding is pending.

However, an individual Licensing Board must have a sensitive regard, consistent with the regulations, for the relationship of the rulemaking proceeding to the individual proceeding. Therefore, it may often be prudent to defer consideration of an issue so long as it appears that the rulemaking may be completed before the individual plant licensing decision will be reached. That is not the case here. We expect to complete the hearing this year. The Commission predicted a two to four year period from November 1981 to "implement" a new ATWS rule.

We believe the correct legal approach, and also the best practical approach in the context of this case, is to approach a generic issue involved in rulemaking which would affect the licensing of a plant in a manner similar to treatment of an unresolved safety issue under the *River Bend* and *North Anna* Appeal Board decisions.¹⁹ ATWS is in any event on the list of Category A unresolved safety issues, but we believe the same approach would be valid even if it was not.

As set forth in an unpublished order issued by the Licensing Board in the Three Mile Island, Unit 1 restart proceeding:²⁰

¹⁸ *Potomac Electric Power Co.* (Douglas Point, Units 1 and 2), ALAB-218, 8 AEC 79, 83-85 (1974). *Sacramento Municipal Utility District* (Rancho Seco), ALAB-655, 14 NRC 799, 816-17 (1981).

¹⁹ *Gulf States Utilities Co.* (River Bend, Units 1 and 2), ALAB-444, 6 NRC 760, 775 (1977). *Virginia Electric and Power Co.* (North Anna, Units 1 and 2), ALAB-491, 8 NRC 245 (1978).

²⁰ *Metropolitan Edison Co.* (Three Mile Island, Unit 1), Docket No. 50-289 (restart), slip op. at p. 4 (March 12, 1981).

However, the fact that an issue relevant to an individual proceeding will be resolved in a generic rulemaking proceeding does not perforce permit the individual proceeding to conclude as if the generic issue does not exist. The board would either have to defer any authorization otherwise justified in the individual case until a determination is reached in the rulemaking proceeding and then factor that determination in, or be able to conclude that such authorization can be granted in the individual case in advance of resolution of the issues on a generic basis. This latter determination could be premised on findings that the problem has been resolved for the individual reactor, or that there is reasonable assurance the problem will be resolved before it has adverse safety implications for the individual reactor, or that alternative means will be available for assuring that lack of resolution of the problem generically would not pose an undue risk from operation of the individual reactor. Cf. *Gulf States Utilities Co.* (River Bend, Units 1 and 2), ALAB-444, 6 NRC 760, 775 (1977).

Under such an approach, we may permit litigation before us of whether it is acceptable under presently applicable safety requirements to authorize Shoreham to operate in the estimated period²¹ before the ATWS problem will be resolved by completion of the rulemaking. In terms of the SLCS, the question will be whether the plant design and operator actions in place pending completion of the rulemaking will compensate for the lack of automatic initiation of the SLCS in terms of providing the level of protection required by GDC 20. Where operator actions are relied on by LILCO in the interim, it will be material to the contention to examine the time available to take the action, and the procedures and training (technical and attitude) for assuring the action will be implemented when necessary.

There may of course be cases where the Commission has made the finding that it is acceptable for an individual license to issue while a rulemaking is pending. Indeed, on the particular hydrogen control question involved in *Rancho Seco* the Commission had made such a determination in the Three Mile Island restart proceeding,²² although we see no explicit recognition of this by the *Rancho Seco* Appeal Board in its decision. 5 NRC 799, 816-17.

²¹ One to three years from the fall of 1982.

²² *Metropolitan Edison Co.* (Three Mile Island, Unit 1), CLI-80-16, 11 NRC 674 (1980). See also the TMI-1 Licensing Board's order of March 12, 1981, *supra*, at pp. 4-5. This Commission determination was also recognized and applied in this proceeding. See Order (unpublished) of Appeal Panel Chairman, dated May 20, 1980, and this Board's Order Admitting SOC Contention 12-3rd Subpart, dated July 2, 1980.

In the ATWS notice of proposed rulemaking, the Commission records its belief that the likelihood of severe consequences arising from an ATWS event is acceptably small in the interim based on a number of factors. One of these is "the initial steps taken to develop procedures and train operators." This is necessarily plant specific, and will be the subject of the litigation on ATWS in Shoreham. Manifestly, the Commission's notice cannot be taken to have made this important finding for us for Shoreham.

We have considered the *Perry* Licensing Board decision cited by the parties.²³ Our result is similar, albeit on the basis of the reasons we have recited. To the extent *Perry* does not make clear that its inquiry may be restricted to the interim period before a rule is adopted, we have so specified in the circumstances of the Shoreham proceeding before us.

In accordance with the above discussion, we admit SC 16 on ATWS, restated as follows:

Although the anticipated transients without scram issue is generically before the Commission in a rulemaking proceeding, Suffolk County contends that LILCO and the NRC Staff have not adequately demonstrated that Shoreham meets the requirements of 10 CFR Part 50, Appendix A, GDC 20, regarding correction of the ATWS problem in the interim period of several years pending completion and implementation of the result of the rulemaking for Shoreham. This is because the interim measures to be taken at Shoreham, including operational procedures and operator training, will not compensate for the lack of an automatically initiated and totally redundant standby liquid control system (SLCS) which meets the single failure criterion.

Remaining Suffolk County Contentions Not Previously Ruled Upon (SC 12, 13, 18, 20, 22, and new 32)

The following Suffolk County contentions were either objected to in whole or in part prior to the conference of parties, or were presented for the first time in Suffolk County's filing of March 1, 1982.

In the absence of objections, the new Suffolk County contention on electrical penetrations, now designated SC 32, was admitted as presented in the County's filing of March 1, 1982, at page 37. (Tr. 296-298.) Although almost identical to the first paragraph of SC 32, due to minor differences which will probably prove to be without any distinction, SOC 19(f) will remain admitted. (Tr. 477-80.)

²³ *Cleveland Electric Illuminating Co.* (Perry, Units 1 and 2), LBP-82-1A, 15 NRC 43 (1982).

After discussion on the first day of the conference, it became apparent that the parties had suggestions which could lead to resolution of the disputes on the other County contentions noted above. Accordingly, the parties were asked to confer that evening. With commendable cooperation and obvious hard work, the parties resolved their differences, and agreed to the admissibility of these contentions, as revised. The County agreed to file formally the revised contentions.

In view of the agreement on SC 12, dealing with design and construction QA/QC, which SOC will also be a party on, SOC has withdrawn its contention 6(a)(i) in lieu of responding to LILCO's motion for summary disposition of that contention. The withdrawal of 6(a)(i) is with prejudice, (except for the possibility of material new information which would be considered if the situation arises), to any intervenor relying on the particular alleged construction defects which were the subject of SOC 6(a)(i) for the basis of claiming inadequate QA/QC with respect to the admitted contentions bearing on that subject. The parties will consider whether revised SC 12 can be combined expressly in some fashion with SC 15. (Tr. 452-62.)

Contention 13a on QA/QC operations was agreed to as originally worded, except that the last phrase "and the guidance in all applicable regulatory guides will be satisfied" was deleted by agreement. (Tr. 467-70.)

SC 18 regarding Human Factors Equipment was agreed upon, as revised, with SOC also a party on the contention. SC 18(d) is revised as set forth in the County's filing of March 1, at page 17. The "for example" is deleted from SC 18(e), and three more control room items were added to the contention: range of the reactor water level display, strip chart recorders and reactor mode switch and key location. SC 28(a)(ii) and SOC 7(A)(2) were deleted in lieu of revised SC 18. (Tr. 470-73.)

SC 20 (Human Factors - Simulator) was revised to focus on the interim period until LILCO obtains a Shoreham specific simulator. The County, if it has a contention on the adequacy of the planned permanent Shoreham simulator, will advance it by the time of the final prehearing conference scheduled for April 13, 1982. (Tr. 473-76.)

SC 22 (SRV Test Program) was agreed to, as modified in the County's filing of March 1, at page 20. SOC will be a party on SC 22 as revised. SC 28(a)(v) and SOC 7(A)(5) were deleted in lieu of SC 22. (Tr. 293-95, 477.)

Security Plan

The County and LILCO are discussing matters relating to whether the County will raise a security plan contention. The County has been pursu-

ing this possibility actively, including having its expert qualified, and under a non-disclosure requirement, to review the plan and talk with LILCO about it. (Tr. 298-300.) If the County wishes to advance a security plan contention, it will do so by April 2, 1982. As part of that same filing, or by separate filings if necessary on the same day, the positions of LILCO and the Staff on any SC security plan contention shall be set forth. If such filings are made, any necessary inclusion of protected information should of course be properly segregated and protected from disclosure to unauthorized persons.

OHILI/NSC Contention 7(i) on security planning was dismissed for failure to pursue discovery and specify the contention in accordance with the Board's order of over four years ago (January 27, 1978; at page 23). (Tr. 300-305.)

Status of County

As discussed (Tr. 305-314), the County does not lose its right to participate as an interested governmental agency pursuant to 10 CFR §2.715(c) because it has elected to participate as a full intervenor on specified contentions. *Project Management Corporation* (Clinch River Breeder Reactor Plant), ALAB-354, 4 NRC 383, 392-93 (1976). However, it may not at this stage, less than two months before the start of the hearing, raise new issues in the case not already embraced within the scope of admitted contentions.²⁴ Accordingly, if the County seeks to litigate new seismic issues as it has indicated it might, it will have to satisfy the balancing test applicable to late contentions. *Gulf States Utilities Co.* (River Bend, Units 1 and 2), ALAB-444, 6 NRC 760, 768-70 (1977).

The Board also noted the potential for unfair surprise in this proceeding if the County files direct testimony on a contention of another intervenor which is not similar to the many contentions the County has chosen to submit. That is, because the County has many contentions in common with SOC, it may have been fairly assumed that the County would file no direct testimony on SOC contentions which it did not have in common. For example, parties would not have been put on notice to pursue discovery of the County on SOC contentions which the County did not share. If the problem arises, we will deal with it. In the meantime, the County is free to file direct testimony on any admitted contention.

SOC and Suffolk County (SC) are directed to coordinate their direct testimony on all contentions which they have in common (as defined by common subject matter) and on all of SOC's contentions on which the

²⁴ This does not apply to emergency planning issues, which are being scheduled separately, and the possible security issues discussed above.

County wishes to take a position through the filing of direct testimony. The coordination shall to the extent practicable, be pursued in good faith, without unduly burdening either SOC or SC, but also without unduly burdening the proceeding with duplicative testimony. Where practicable, SOC and SC are encouraged to co-sponsor joint written testimony, and shall where possible co-sponsor panel presentations of similar written testimonies. Similarly, where their positions are similar, the Staff and LILCO shall co-sponsor joint panel presentations of their written testimonies. In view of the coordination we are now seeking, and our confidence that the parties will pursue this in good faith with the result of much more efficient hearing, the Board can be more flexible on the schedule for the filing of testimony than was indicated at the hearing. We discuss this below.

Emergency Planning Contentions²⁵

SOC Contentions 1 and 2, as framed by the filings of SOC in response to the motions for summary disposition by LILCO and the Staff, and SOC's response to the Board's Order of February 8, 1982, and the discussion at the conference (Tr. 346-385), were dismissed as a challenge to the Commission's emergency planning regulations. 10 CFR §50.47 and Appendix E to 10 CFR Part 50. Our reasons were outlined at the Conference. (Tr. 388-92).

We found that the contentions as framed by the filings and argument were asking for a totally new probabilistic accident risk and consequences analysis to determine on a clean slate (as if the rule did not exist) what zones should be established for the plume exposure pathway and ingestion pathway EPZ's. The emergency planning rule was promulgated after these contentions were admitted. If it were construed to permit such a case by case ad hoc analysis the 10 and 50 mile general specifications for the respective EPZ's would be meaningless, notwithstanding the flexibility in the rule.

As indicated, the dismissal was without prejudice to the submission, on the schedule to be established for offsite emergency planning contentions, of contentions that adjustments must be made to the approximate 10 and 50 mile Emergency Planning Zones due to particular local conditions within the flexibility permitted by the regulations. In addition, our ruling does not preclude a contention that because of the geography of Long Island, evacuation planning within an approximate 10 mile EPZ may not be adequate because of the impacts of persons outside and to the east of the EPZ choosing to evacuate and having to do so by coming through the

²⁵ SOC Contention 12 (Part 2), regarding downcomer supports was withdrawn (Tr. 325).

EPZ. The Board indicated that whether or not contentions were filed on this issue, it would be pursued by the Board (Tr. 396-97).

The Board directed the parties present at the conference to file by March 29, 1982, their joint (or at least coordinated) advice as to whether the filings and litigation of on-site emergency planning contentions can be scheduled in advance of off-site emergency planning. (Tr. 450-52.) If the OHILI/NSC intervenor group wishes to participate, it must contact the parties.²⁶

The Board also directed the respective parties to file by March 29 the documentation in their possession, along with whatever explanations or caveats they wish to make as to *e.g.*, the incomplete draft nature of the material, its lack of usefulness or applicability for emergency planning issues, the fact that the further final documents will be forthcoming (and when), etc. The NRC Staff shall file its existing computer run of the CRAC code for Shoreham. LILCO shall file its accident consequence study. Suffolk County shall file its draft emergency (including evacuation) plan. (Tr. 397.)

In addition by March 29, the County will file its schedule for completion of its emergency plan, including interim milestones if possible and a description of what remains to be done. The Staff will provide a status and schedule for all other pertinent emergency plans and the FEMA review. Counsel for the New York State Energy Office and Public Service Commission will provide further detail with respect to the status of the State plan. (Tr. 397-99.)²⁷

Schedule

The Board will hold a final prehearing conference pursuant to 10 CFR §2.752 on April 13, 1982, at approximately 10:00 AM. The exact time and location in Suffolk County will be announced.

The Board will visit the Shoreham site on the morning of April 14, hopefully as early as 8:30 AM, so as to conclude by 1:00 PM, if that can be arranged by LILCO. Counsel for the parties are encouraged to attend.

The Board will hear limited appearance statements on the evening of April 13 and the afternoon and evening of April 14. The exact time and location in Suffolk County will be announced. Counsel for LILCO and the

²⁶ The broad NSC/OHILI contention 7(j) will be dismissed if it is not particularized on the schedule to be established for on-site and off-site emergency planning contentions. (Tr. 400.)

²⁷ Although not tied to emergency planning, we confirm here that, also by March 29, the Staff will file a status report detailing the schedule of the remaining Staff review, focusing on matters related to contentions in the proceeding. (Tr. 436-37.). In addition, the Staff and LILCO will each file by March 29 their estimates, or range of estimates, for the completion of construction of Shoreham, with explanation of the uncertainties. (Tr. 449-50).

Staff are required to attend. Counsel for the other parties are encouraged to attend.

The following schedules do not include emergency planning issues.

Completion of Discovery (Tr. 512-15)

The following schedules were established in the event the intercession of the Board is needed to resolve a discovery dispute. However, the Board is pleased that the parties are continuing their productive discovery meetings which serve the purposes of efficiently providing the discovery sought and keeping misunderstandings and disputes requiring our resolution to a minimum.

All dates are received-by-5:00-PM dates (unless otherwise stated) by lead counsel for the Staff, LILCO, Suffolk County and SOC and by the Board. Others on the service list shall be served by placing the filings in the first class mail on the same date. Extensive discovery documents need not be included with the cover material to other than those enumerated in the first sentence.

For all contentions except SC-16, (ATWS) and SC-20 (simulator); these discovery requests were due by the March 9 conference of parties. If the response time in the regulations is less (due to earlier filing of the request), it shall be followed but considered as a receipt-of-responses date rather than a mailing date.

March 15

(12 Noon): Objections received

March 18: Motions to compel received

March 19: Conference call by Board if necessary to rule

March 26: Responses to requests, received

March 26: Last date for taking of depositions (permitted on a minimum of five days from receipt of oral notice. Written confirmation shall be filed rapidly).

For contentions SC-16 (ATWS) and SC-20 (Simulator);

April 2: Requests received

April 9: Objections received

April 13: Motions to compel (received at beginning of prehearing conference) to be ruled on at prehearing conference

April 23: Responses to requests, received

April 23: Last date for taking of depositions (permitted on a minimum of 10 days from receipt of written notice).

Testimony

At the conference of parties, the Board directed that testimony on all contentions, except SC-16 and SC-20 and Staff and LILCO testimony on SC-7B be filed by placement in the mail (or by more rapid means) by April 13, and that at least one copy for each of the parties and Board also be distributed at the April 13 prehearing conference. In the first instance, the Board erred in not also excluding testimony on SC-1 (remote shutdown panel), SC-8 and SOC-19(h) (environmental qualification), and SC-23 (containment isolation). Since matters affecting these three issues are still under Staff review, and will not be completed by the Staff until even after the still pending Supplement-2 of the SER, the Board intended to establish no schedule for the filing of testimony on these three issues, consistent with the discussion at Tr. 437-440. However, preparation of testimony now should anticipate that the testimony will be required approximately one month from issuance of the NRC Staff's review. That completion of the Staff review should be filed in the most expeditious written form by the Staff (*i.e.*, an SER supplement, an advance portion of an SER supplement, or Staff testimony).

At the conference, the Board further required the receipt of testimony on SC-16 and SC-20 by May 25 (at the hearing which should then be in session). Intervenor's direct testimony on 7B must be filed by April 13, as discussed in the ruling on this contention since it will be the first testimony presented at the hearing.

The first three weeks of the hearing have been scheduled for May 4-7, May 11-14, and May 25-28. The Board reconsidered its testimony filing schedule. We believe the initial schedule to be fair after the extensive amount of prehearing time to prepare testimony (at least five months and arguably years), even though the filing time of mid-April was not set until our February 8, 1982 order. However, to assure better high quality testimony which is fully coordinated as required above, and carefully honed to focus on that which is really significant and material to the matters in controversy, we believe the schedule can be relaxed without delaying the hearing schedule.

The parties shall file direct testimony on the April 13 schedule on a sufficient number of contentions *to assure* four weeks of hearing time. The parties shall reach agreement on this by jointly specifying the contentions on which testimony need not be filed by April 13. Any disagreements shall be noted. This specification must be received by the Board as soon as possible, and not later than March 22. Testimony on all other contentions, except those three not scheduled due to the incomplete Staff review, shall be received by May 25.

The direct testimony shall have a brief cover outline setting forth its purposes and objectives. This outline, which is in effect an advance very "bare-bone" skeleton of the proposed findings, will be bound into the record with the testimony. However, it is not part of the record and may not be cited in support of proposed findings. The testimony shall also contain a listing of all exhibits (or portions thereof) which will be moved into evidence as part of the support for the testimony. The exhibits (except for LILCO's and the Staff's main review documents) shall be served with the testimony, unless the exhibit also is being served with other testimony being filed by the same or another party. Professional qualifications of the witnesses shall be filed with the testimony. Where there are multiple witnesses, the testimony shall specify which witness prepared each part within the combined testimony, unless it is impossible to do so. Such inseparable parts of the testimony shall be kept to a minimum.

Cross-examination plans shall be received by the Board at the beginning (usually Tuesday) of the hearing week *before* the testimony is estimated to be given. Accordingly, cross-examination plans for the first hearing week of May 4-7 must be received by April 27, 1982. The Board will clarify the discussion of cross-examination plans which was conducted at the conference of parties (Tr. 314-23) in a written order issued in advance of the April 13 prehearing conference.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Lawrence Brenner, Chairman
ADMINISTRATIVE JUDGE**

**James H. Carpenter
ADMINISTRATIVE JUDGE**

**Frederick J. Shon
ADMINISTRATIVE JUDGE**

Bethesda, Maryland
March 15, 1982

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Peter B. Bloch, Chairman
Jerry R. Kline
Hugh C. Paxton**

In the Matter of

**Docket Nos. 50-266-OLA
50-301-OLA**

**WISCONSIN ELECTRIC POWER
COMPANY**

**(Point Beach Nuclear Plant,
Units 1 and 2)**

March 19, 1982

The Licensing Board affirms its earlier decision that rescission of a liberal policy toward the admission of contentions was proper once the time pressure that justified the policy was relieved by a change in the applicant's plans. The ruling permits the intervenor to challenge the policy change by showing specific prejudice that has resulted from expectations raised by the institution of the liberal policy.

RULES OF PRACTICE: ADMISSION OF CONTENTIONS

Though a Board may admit a single broad contention in the interest of expedition, its liberal policy toward the admission of contentions may be rescinded when the time pressure justifying it is relieved by a change in applicant's operational plans. Issues already raised under the liberal policy are not retroactively affected its rescission.

**MEMORANDUM AND ORDER
(Concerning a Motion to Reconsider)**

On February 19, 1982, Wisconsin's Environmental Decade (Decade) requested reconsideration or clarification of one portion of our decision of February 19, 1982, LBP-82-10, 15 NRC 341.

In the contested portion of its decision, section IV, the Board rescinded its previous policy of permitting Decade to raise new issues freely, without regard to the requirements of 10 CFR §2.714(a)(1). In so acting, the Board explained that its previous policy had been adopted in response to time pressures needed to meet Wisconsin Electric Power Company's (applicant's) operational needs but that the time pressures had been relieved because applicant no longer planned to sleeve Unit 1 this Spring. The Board also ruled that "Decade may properly raise all matters already submitted on the record of this proceeding."

I. REQUEST TO RECONSIDER

Decade bases its request to reconsider on assurances provided to it in the course of a telephone conference, conducted on January 11, 1982. Decade states that the Board assured it that it would not be necessary to provide a basis for its subcontentions (arguments related to the single contention admitted by the Board) until the proceeding reached the stage of summary disposition. Tr. 866-867; see also, Tr. 770. Decade also states that it:

has been acting in good faith reliance on the Board's representations cited above. Therefore, it would be inappropriate to fundamentally alter previously established procedures in mid stream to the egregious disadvantage of the intervenor.

Motion to Reconsider at 3. The Commission's staff agrees with this argument.

Applicant opposes Decade's motion for reconsideration on the ground that the Board's liberal invitation for new contentions has always exceeded its authority and that, in any event, it is appropriate to decide to apply Commission regulations when there is no reason to continue to waive them. It also argues that Decade has not shown how it would be prejudiced by returning to the full application of the rules. Licensee's Answer (March 10) at 2.

We agree with Applicant and have decided to affirm the contested ruling. The Board initially adopted a series of measures in order to expedite the proceeding to meet Applicant's needs. LBP-81-39, 14 NRC 819 (1981). In that order, we stated that the need for expedition had been created by applicant, "which delayed filing its amendment only because of its incorrect assumption that a hearing would not be necessary." *Id.* at 823. Consequently, we granted some special procedural advantages to Decade in order to help to offset the disadvantages accruing to it from the press of time.

In the same telephone conference on which Decade relies for its argument that we assured it that it need not provide basis for its contentions

until a later stage of the proceeding, the following dialogue also took place:

CHAIRMAN BLOCH: Mr. Churchill [for applicant], our reason for the continuing leniency on bases [for contentions], if you recall, was that you were asserting that there is a possibility that you might want to go ahead with full-scale sleeving on Unit 1 this spring. Is that still a possibility, *or are we now using more lenient standards on contentions than we need to, given the requirements of the case?*

MR. CHURCHILL: I can't answer that question; I really don't know. Yes, it is a possibility. It is likely that there will be full-scale sleeving; I don't know the answer to that

[Emphasis supplied.] Tr. 874. In this dialogue, the Board indicated that the invitation for filing new subcontentions, under the broad contention admitted by the Board, was contingent on the continuing need for expedition in the proceeding. Hence, it should have been no surprise to Decade that when applicant informed the Board that sleeving would not occur in the Spring, thus destroying the rationale for continued leniency regarding contentions, the Board considered it necessary to return to the more ordinary application of the Commission's procedural rules.

Although we felt that our return to the application of ordinary rules was compelled by changed circumstances, we were impressed by staff's argument that Decade should be able to continue relying on the Board's assertions. We would not want to create a situation in which we in any way misled a party into forfeiting its rights. Consequently, we carefully examined Decade's filing to see whether it suffered any prejudice as the result of our assurances. However, we find that Decade has not alleged any specific prejudice, merely asserting "egregious disadvantage" without explaining any way in which it was disadvantaged. Hence, we believe it is correct to rescind an extraordinary privilege whose rationale disappeared; and we do not believe that the rescission of this privilege has been shown to have damaged Decade in any way. (Should Decade subsequently demonstrate specific prejudice resulting from our procedures, we will consider the nature of the prejudice and whether it has been raised in a timely fashion and will consider whether a remedy is appropriate).

II. REQUEST FOR CLARIFICATION

Decade urges that we clarify the status of matters raised by it in its letter to staff on January 18, 1982. We agree with staff and with the carefully limited concession made by applicant that the matters listed in Decade's January 18, 1982, letter to the Staff were "matters already submitted on the record" and therefore were properly raised under the single broad contention admitted by the Board. Decade need not dem-

onstrate the basis for these contentions until it submits its Motion Concerning Litigable Issues, pursuant to LBP-82-10, 15 NRC 341, 344-346 (1982). (Decade also is under a continuing obligation to respond to interrogatories which have requested it to supply a basis for its contentions.)

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is this 19th day of March, 1982,

ORDERED

Wisconsin's Environmental Decade's Motion to Reconsider, filed on February 24, 1982, is denied, except to the extent that this memorandum clarifies the meaning of certain language used by the Board.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Peter B. Bloch, Chairman
Dr. Oscar H. Paris
Mr. Frederick J. Shon**

In the Matter of

**Docket No. 50-155
(Spent Fuel Pool Amendment)**

**CONSUMERS POWER COMPANY
(Big Rock Point Plant)**

March 19, 1982

The Licensing Board refuses to admit any of 18 late-filed contentions.

RULES OF PRACTICE: SUMMARY DISPOSITION

A summary disposition decision that an allegation presents no genuine issue of fact may preclude admission of a subsequent, late-filed contention based on the same allegation.

**RULES OF PRACTICE: GOOD CAUSE FOR LATE FILING OF
CONTENTIONS**

If an intervenor has special permission to file a contention prior to an extended deadline, it must file the entire contention by that deadline, including the basis for it. If it fails to meet that obligation, it must show good cause for late filing.

LICENSING BOARDS: *SUA SPONTE* AUTHORITY

Because Boards may raise important safety and environmental issues *sua sponte* they should review even untimely contentions to determine that they do not raise important issues that should be considered *sua sponte*.

MEMORANDUM AND ORDER
(Concerning Additional Contentions)

On September 4, 1981, Christa-Maria, Jim Mills and Joanne Bier (Christa-Maria) filed a motion styled alternatively "Additional Contentions" or "Motion for Leave to File Additional Contentions." The Commission's staff (staff) responded on September 15, 1981, and Consumers Power Company (applicant) responded on the same day. Then, in its Reply, filed on October 9, 1981, Christa-Maria attempted to provide a basis for its 18 additional contentions (plus' subparts). Staff and applicant oppose the admission of all of the new contentions.

We have decided not to admit any of the additional contentions as issues in this proceeding. We find that intervenor has not shown good cause for the late filing of the basis of these contentions, that the untimely allegations of the reply failed to show a basis for these contentions and that there are no issues of such importance that the Board should consider them *sua sponte*. We also review the relationship between the additional contentions and our decision in LBP-82-8 (February 19, 1982) and we find that some of the issues raised by the additional contentions have already been either included or excluded from the proceeding in our earlier decision.

I. GOOD CAUSE FOR LATE FILING

Christa-Maria seeks admission for its additional contentions on two separate grounds: (1) that the January 17, 1981, Special Prehearing Conference Order, LBP-80-4, 11 NRC 117 (1980) authorized late filing; (2) that language of the Board's chairman in the course of the Special Prehearing Conference authorized late filing. Christa-Maria made no attempt in its September 4 filing to explain how it satisfied the criteria for late filing set forth in 10 CFR §2.714(a)(1)(i-v); its attempt to satisfy those criteria was made in its subsequent Reply.

A. Special Prehearing Conference Order

Christa-Maria argues that the special prehearing order authorized late filing of contentions related to its initial contentions 4 and 7. Intervenors' Reply at 3-4; LBP-80-4, 11 NRC 117, 124 (1980)

Contention 4 related to: (1) the insufficiency of information in the application about the spent fuel racks, including their configuration, the type of rack and the vendor, and (2) the pool environment, including whether it is borated, oxygenated, stagnant or demineralized. Contentions

of Christa-Maria, October 30, 1979 at 3. Contention 7 dealt with increased radiation absorbed by the plant's demineralizers and then "released to the atmosphere through the off-gas system." *Id.* at 4.

The stipulation governing the withdrawal of Contention No. 4 and extended by the Board to include Contention No. 7, stated:

Contention No. 4 is withdrawn by Christa-Maria at this time; provided that after reviewing information concerning the matters raised in the contention as written in the October 30, 1979 submittal to the Licensing Board, Christa-Maria may assert a new contention within the subject matter parameters of said Contention No. 4; and provided further that said new contention must be filed before the close of the time for discovery as provided by the Licensing Board.

Stipulation Among NRC Staff, Christa-Maria and Consumers Power Company (November 26, 1979) at 3. Since the stipulation was signed by the parties and accepted by the Board, it is binding on this proceeding. The September 4 filing was received roughly within the specified deadline, since the Board ruled that the schedule provided in its Special Prehearing Conference Order (11 NRC 134) should be measured from July 22, 1981, rather than from the date of issuance of the Safety Evaluation Report and the Environmental Impact Assessment. ORDER (Revising Schedule), June 16, 1981. The additional contentions were filed September 4, roughly 47 days after July 22.

Intervenors Reply, which contained its alleged basis for the additional contentions was not, however, timely. It was filed more than 30 days after the close of discovery and the extended deadline for the filing of contentions based on the SER and EIA. To be timely under the Board's order, the additional contentions had to be filed before the end of discovery. In addition, to be timely under the authorization for filings related to the EIA and SER, the filings also had to be completed within the 47 day deadline. In this case, the period allotted for discovery was extended by the Board on motion of the intervenors. The extension was intended to permit ample time for the filing of late contentions. No further extension of the time for filing was requested. Yet the intervenors failed to provide the basis for their contentions in a timely fashion.

This lack of timeliness cannot be lightly excused. By that stage of the proceeding, intervenors were fully informed of their obligations concerning the filing of contentions. The Special Prehearing Conference Order in this case applied the requirement that the basis of contentions be specified. Intervenors had ample time to study the relevant papers to decide whether or not they had a basis for their contentions and to assemble that basis for filing in the appropriate document. There simply is no excuse for the basis of contentions not being included in the September 4 filing and the Board

finds that there has been an inadequate showing that the untimely attempt to supply a basis for these contentions should be accepted. Consequently, we rule that the basis for these contentions was not filed in a timely fashion.

II. EFFECT OF THE BOARD CHAIRMAN'S COMMENTS

In the course of the Special Prehearing Conference, the following exchange occurred:

MR. O'NEILL: Well, again I'm just a poor country boy. Maybe you can clarify a matter for me.

If *during discovery* I find out that there's another . . . specific matter, let's say, you know, what is the effect of a worker dropping his lunch pail in the pool, is it possible then for me to formulate another contention based on that?

CHAIRMAN GROSSMAN: Let me say this: Any time during the proceeding that you *discover* a safety question that ought to be addressed, you certainly ought to apply to the Board, and I can't see that we would ever deny a request if there is a legitimate safety question involved.

[Emphasis supplied.] Tr. 195-6.

We do not interpret chairman Grossman's statement to be a general invitation to file late contentions without regard to the regulatory criteria for late filing. The language we have emphasized indicates that the Chairman was focusing on matters uncovered in the course of discovery, not on matters that just happened to occur to an intervenor as time passed. To that extent, the Chairman's ruling is consistent with the Board's continuing views. LBP-82-8, 15 NRC 299, 329-330 (1982) (admissibility of overflight of national guard airplanes) and *id.* at 331-332 (admissibility of contentions arising from facts uncovered in the course of discovery).

This interpretation also is consistent with the Board's action in establishing a special deadline for "filing any new contentions based on new information contained in SER and EIA within 47 days of SER and EIA issuance." Special Prehearing Conference, Order 11 NRC 134. It is clear from the wording of the deadline, pursuant to which the present filing was made, that the only new contentions being invited were those based on the SER and EIA, documents that has not previously been available. We note that this interpretation is consistent with 10 CFR §2.714(a)(1)(i-v).

We conclude that there was not broad-brush invitation to file late contentions in this proceeding.

III. GOOD CAUSE FOR LATE FILING

Commission regulations provide criteria for late filing. In its Reply, Christa-Maria attempted to show that its September 4 filing met these criteria for late filing. However, it made no showing that it was necessary for it to wait until October 9, 1981 to file the basis for these contentions.

We have generally been somewhat congratulatory in tone concerning the usefulness of intervenors' participation in this proceeding. See LBP-82-8, 15 NRC 336-337. However, intervenors' September 4 filing of additional contentions was lacking in quality. There were no citations to specific documents except for general citations to the application. There was little effort to describe in detail the specific items of concern to intervenors. Indeed, the contentions filed at this late point in the proceedings were generally less specific than those filed by Christa-Maria at the outset of the proceedings. Contentions of Christa-Maria, October 30, 1979.

Hence, we reach the conclusion that intervenors failed to provide a basis for the contentions it filed on September 4 and that good cause for late filing of the bases for these contentions has not been shown. A consequence of intervenors' omission of the bases for its contentions is that applicant and staff both filed extensive responsive pleadings arguing that basis was lacking. These pleadings would be entirely wasted and irrelevant were we to accept the addition of bases by intervenors at a subsequent juncture. We cannot accept that consequence of intervenors' unexplained tardiness. We rule that there was no showing of good cause for the late filing of the bases for the contentions.

IV. BASIS FOR ADDITIONAL CONTENTIONS

Even though there has been no showing of good cause for late filing, we are hesitant to reject any contention supported by sufficient basis to demonstrate that the public health and safety or the environment would be endangered. In such a case, we would be obligated to exercise our authority to declare such an issue part of the proceeding, perhaps by analogy to the *sua sponte* authority provided for in operating licensing cases.

Consequently, we have reviewed Christa-Maria's contentions to determine whether any serious safety issues have been included in its filings, and we have determined that no serious *new* issues have been raised by it. Some of the issues Christa-Maria mentions are important; but we find that each of those important issues already is a part of the proceeding as the result of our earlier decision in this case. LBP-82-8, 15 NRC 299 (1982). In the course of this review, we also have found that the contentions that have not already been admitted under LBP-82-8 are without basis and should be excluded from consideration on that independent ground.

In addition, we consider that LBP-82-8 is determinative concerning the

admissibility of several of the additional contentions. In some instances, it ruled that intervenors had failed to show the existence of a genuine issue of fact. Since those issues of fact already were relevant to admitted contentions, failure to show the existence of a genuine issue of fact precludes admission of a new contention which depends on the same genuine issue of fact. In other instances, the Board admitted issues into the proceeding that permit intervenors to litigate some of the most important points they sought to raise in their late contentions.

We find the following portions of LBP-82-8 to relate to the additional contentions:

† LBP-82-8, *id.* at 312-315 rules that there is a lack of a genuine issue concerning an increased hazard of radioactive effluents from the expansion of the fuel pool. Hence, there is no genuine issue concerning Iodine-129 and Krypton 85, as asserted in additional contention 1.

† *Id.* at 322 admits for litigation a broad issue concerning the adequacy of hiring, training and supervision and health physics safeguards during installation of new fuel racks. This would permit intervenors to challenge applicant's health physics plans if they do not deal adequately with problems created by radioactive crud, thus covering the concern raised in contention 4.

† *Id.* at 331-332 permits litigation of a cask drop incident, thus permitting intervenors to raise some of the issues covered by their contentions 6 and 7. Whether or not intervenors may argue for a pool cover depends on their first establishing the credibility of an accident which might require such a solution. Then intervenors will need to show the credibility of their preferred solution. We note that intervenor's reply, at 10, does not show any reason for believing that a pool cover is feasible or would be helpful in the event of a cask drop or that such a cover would not create additional safety problems of its own.

† *Id.* at 332-333 admitted a K_{eff} contention. Under this contention, if intervenors should show a danger of criticality during the removal and installation of racks, they will be able to litigate additional contention 8, concerning boration of the pool during removal and installation. Under the admitted contention, proof concerning the effect of rack deformations such as are suggested under contention 14 would be admissible providing that intervenor shows the event is credible and would affect K_{eff} .

† *Id.* at 309-310, 311-312 admits a contention relating to a zircaloy/steam reaction, thus admitting a portion of new contention 12. However, *id.* at 308 finds that there is no genuine issue relating a TMI-accident because there was no showing that expansion of the fuel pool would exacerbate such an accident. Since intervenors could have shown a connection between a meltdown and expansion of the fuel pool as part of its TMI-contention it cannot introduce this issue as an additional contention in contention 12.

We also note that several of the additional contentions are basically not factual contentions but are legal argument. If we can be persuaded that these legal arguments are correct and that there is a requirement for preparation of an environmental impact statement or the assessment of environmental alternatives then we will act accordingly.

Additionally, we find that most of the factual contentions have not specified their basis with sufficient particularity, for the reasons shown in Table 1.

There are two common deficiencies which bear discussion. In some instances, intervenors have expressed dissatisfaction with the completeness of the SER. However, that is not enough to raise a safety issue in this proceeding. Intervenors must show that there is a serious safety or environmental deficiency in the application, not in the staff's work. Only in an egregious case, where the staff's work appears to have been so deficient as to deprive the public of the protection the staff generally affords to public health and safety, would it be appropriate to defer a licensing decision because the staff work is inadequate. Generally, minor deficiencies in the SER must be shown to be safety problems in the application or they will not be admitted as contentions in a licensing proceeding.

The other common deficiency is that intervenors have in several instances cited another proceeding without showing why that proceeding is relevant or even indicating a knowledge of how the two proceedings differ. Such a use of precedent is not an adequate method of establishing basis for a contention.

TABLE 1

Contention	Reason It Lacks Basis
1	No basis for rejecting staff's finding in the cited portion of the EIA that there would not be significant additional emissions of Iodine-129 and Krypton-85.
2	No reason to believe that fuel elements need to be encapsulated. No reason to believe that there is a relationship between staff findings on p. 8 of the EIA and this contention.
3	No reason to believe the containment should be isolated during fuel transfer operations. Cited EIA sections and the cited case do not support this notion. No reason to believe that there is faulty isolation equipment or that expansion of the fuel pool calls for new fuel transfer procedures.

(CONTINUED)

Contention**Reason It Lacks Basis**

- 4 Basis is not at issue. The issues that are raised may be discussed under Christa-Maria Contention 2.
- 5 No reason to believe that the spent fuel storage racks will be cut up and shipped. EIA §5.3.3 and licensee's answers to intervenors' interrogatories indicate that the racks will not be cut up.
- 6 Basis is not at issue. The issues may be discussed under O'Neill II C., as revised, and under O'Neill II E.-3, to the extent that realistic rack deformations can be shown.
- 7 No reason for believing a pool cover would be helpful or feasible as a response to possible cask drop accidents.
- 8 No reason to believe that boration is necessary or that racks containing fuel can be overturned, spilled or damaged.
- 10 No reason to believe that local meteorology or turbine characteristics may credibly lead to the generation of such missiles or that the expansion of the fuel pool would substantially add to the risk of such missiles.
- 12 No indication of how a steam explosion or meltdown would occur or would disperse the contents of the fuel pool
- 13 No basis for believing that alternative sources of power are not available or reliable or that an expected outage would be of sufficient duration to affect the pool.
- 14 No reason to believe a criticality excursion would occur unless boration is used. Also no basis for believing that the accident mechanisms are credible.
- 15 Withdrawn.
- 16 No reason to believe any radioactivity will leak.

(CONTINUED)

Contention**Reason It Lacks Basis**

- 17 No reason to believe that Big Rock Point is not seismically qualified or that whether it is seismically qualified is related to the fuel pool expansion. No reason to believe an earthquake would lead to a meltdown in the fuel pool or that the pool would somehow contribute to a meltdown in the reactor.
- 18 No reason to believe a rad-waste facility related to the fuel pool expansion is proposed or planned or would cause any problems.
-

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is this 19th day of March, 1982,

ORDERED

None of the Additional Contentions of Intervenors Christa-Maria, Jim Mills and Joanne Bier, as filed on September 4, 1981, shall be admitted as issues in this proceeding. However, the Board defers its decision on the need for an Environmental Impact Statement and for the assessment of alternatives, pending receipt of briefs on these issues.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE

Oscar H. Paris
ADMINISTRATIVE JUDGE

Frederick J. Shon
ADMINISTRATIVE JUDGE

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Ivan W. Smith, Chairman
Dr. Walter H. Jordan
Dr. Linda W. Little

In the Matter of

Docket No. 50-289
(Restart)

**METROPOLITAN EDISON
COMPANY**
**(Three Mile Island Nuclear
Station, Unit No. 1)**

March 23, 1982

Pursuant to licensee's motion, the Licensing Board clarifies a provision of its Partial Initial Decision of December 14, 1981, relating to the separation of Three Mile Island Units 1 and 2.

MEMORANDUM AND ORDER

In the Partial Initial Decision of December 14, 1981 (LBP-81-59, 14 NRC 1211) the Board imposed a condition relating to the separation of TMI Units 1 and 2:

During any Unit 2 fuel movements Licensee will suspend work in the Unit 1 area of the fuel handling building and whenever Unit 1 fuel movements are in progress the engineered safety feature filtration system for Unit 1 will be in operation.

PID ¶ 1326(a).

The condition was imposed as practical (but not literal) compliance with short-term item 4 of the August 9, 1979 Notice of Hearing relating to the separation of the fuel handling areas of Units 1 and 2. 10 NRC at 145; PID ¶ 1261.

On March 12, 1982 the Licensee filed its motion for clarification, or in the alternative, reconsideration of the Board's ruling with respect to the fuel-handling building engineered safety feature (ESF) filtration system.

Because the evidence indicated that there would be no fuel handling in the TMI-1 fuel handling area until the first refueling outage after restart, we approved delayed operability of the ESF filtration until then. PID ¶ 1266. Licensee reports now that the Unit 1 steam generators recently have been observed to be subject to some chemical attack, a circumstance which has received wide public attention. Concerned that the same situation may prevail within the reactor vessel, Licensee intends to remove the vessel head for inspection. Further examination might indicate the need to defuel the core and possibly to transfer the fuel to the spent-fuel pool for temporary storage. The present schedule is to remove the reactor head on April 2. No schedule has been set for any fuel removal. The filtration system has not been, and cannot be installed by April 2, or, apparently, in time for any possible fuel removal during the forthcoming inspection.

The first portion of Licensee's March 12 motion is a request that the Board clarify that it did not intend to require operation of the ESF filtration system during fuel movement prior to restart. Licensee correctly observes that the condition taken literally would prohibit fuel movement at any time — before or after restart — without the filtration system in operation.

The second portion of the motion requests modifications of the condition even as to its application after restart.

The Board discussed this motion with the parties present at the public preliminary hearing on another matter on March 18, 1982. Intervenors Sholly and Union of Concerned Scientists do not intend to answer the motion. The NRC Staff orally supported the motion insofar as it relates to pre-restart fuel movement, but will answer in writing in the normal course with respect to the other modifications requested by Licensee. The Commonwealth of Pennsylvania, which originally requested the filtration condition, has no objection to any aspect of Licensee's motion. No other party has previously demonstrated an interest in this aspect of the proceeding. We are therefore ruling on the pre-restart aspect of the motion before the expiration of the normal time afforded parties to answer motions.

The motion as it relates to pre-restart fuel handling is granted on two bases. First, the Board was not granted jurisdiction in the August 9, 1979 Notice of Hearing to control the Licensee's activities attendant to pre-restart cold shutdown. 10 NRC 141. Second, jurisdiction aside, imposing the ESF filter system requirement prior to restart would result in a consequence not anticipated at the hearing or intended by the Board's order. Licensee points out, and the Staff agrees, that the fuel now in the Unit 1 core has passed through a decay time of more than three years; thus movement of the fuel without an operable ESF filter system would

not present a safety problem.* Moreover, neither the Board nor any party anticipated the current need for pre-restart fuel movement. Therefore the relief requested by Licensee with respect to pre-restart fuel movement is correctly stated to be a clarification, not a reconsideration, of the condition. The condition is therefore clarified according to this order. We will later address the balance of the motion.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Ivan W. Smith, Chairman
ADMINISTRATIVE LAW JUDGE**

Bethesda, Maryland
March 23, 1982

* See affidavit attached to Licensee's motion. The Staff's position was stated by counsel at Tr. 27,020-022.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Peter B. Bloch, Chairman

Michael A. Duggan

Robert M. Lazo

In the Matter of

Docket No. 50-389A

**FLORIDA POWER & LIGHT
COMPANY**

(St. Lucie Plant, Unit No. 2)

March 24, 1982

In light of a comprehensive settlement agreement among the parties, the Licensing Board grants the joint motion of applicant and intervenors to dismiss the proceeding.

**ANTITRUST PROCEEDING: JURISDICTION OF LICENSING
BOARD**

Once the Attorney General of the United States has withdrawn from the proceeding and permission has been granted to the remaining intervenors to withdraw, the Board no longer has jurisdiction to entertain an antitrust proceeding under the provisions of the Atomic Energy Act.

APPEARANCES

J.A. Bouknight, Esq. and Herbert Dym, Esq. for Florida Power & Light Company.

Robert A. Jablon, Esq., Alan J. Roth, Esq., Daniel Guttman, Esq. and Marta Manildi for Florida Cities, intervenors.

Ann Hodgdon, Esq. and Benjamin Vogler, Esq. for the Nuclear Regulatory Commission Staff.

Lynn Bregman, Esq. for Parsons & Whittemore, Inc., *et al.*, *amicus curiae*.

MEMORANDUM AND ORDER
(Concerning Motions to Dismiss, Terminate and Vacate)

Florida Power & Light Company (FPL) has entered into a comprehensive settlement agreement with Lake Worth Utilities Authority, the Utilities Commission of the City of New Smyrna Beach, the Sebring Utilities Commission, and the Cities of Alachua, Bartow, Fort Meade, Homestead, Key West, Kissimmee, Leesburg, Mount Dora, Newberry, St. Cloud, Starke, Tallahassee and Vero Beach, Florida, and the Florida Municipal Utilities Association (Cities). Pursuant to that agreement, on March 10, 1982, FPL and Cities filed a Joint Motion to Withdraw Interventions, Dismiss and Terminate Proceedings, and Vacate Memorandum and Order. On the same day, Cities also filed a Withdrawal of Request for Hearing.

These motions are opposed by Parsons & Whittemore, Inc. and Resources Recovery (Dade County), Inc. (collectively RRD) as *amicus curiae* (letter of March 15, 1982), a status to which RRD was admitted by Board order, affirmed in a footnote of an appeals board decision, LB-81-19, 14 NRC 87, 96 (1981); compare LBP-81-28, 14 NRC 333, 346 (1981) (invitation withdrawn); but see ALAB-665, 15 NRC 22, 35 (footnote 19, paragraph 2)(RRD has been granted *amicus* status).

I. DISMISSAL

FPL and Cities argue that their Settlement Agreement should be accepted as a basis for dismissing this case. They state, correctly, that an antitrust proceeding is not required by statute and occurs only if a party has intervened or the Attorney General of the United States advises that a proceeding is required, under Section 105c(5) of the Atomic Energy Act. Consequently, an antitrust proceeding is in the nature of an operating license proceeding and it ordinarily is appropriate to terminate such a proceeding when all admitted intervenors have withdrawn. *In the Matter of Georgia Power Company (Edwin I. Hatch Nuclear Power Plant, Unit No. 2)*, LBP-74-52, 8 AEC 107 (1974); see also *In the Matter of Baltimore Gas & Electric Co. (Calvert Cliffs Nuclear Plant, Units 1 & 2)*, LBP-73-15, 6 AEC 375, 377 (1973).

In its letter as *amicus* RRD does not oppose the argument presented to us about the nature of our jurisdiction, and that unopposed argument appears to us to be correct. We therefore conclude that our jurisdiction depends on the presence in the proceeding of either the Attorney General of the United States or of an intervenor. Since RRD has been denied status as an intervenor and since the Attorney General withdrew pursuant

to a prior settlement agreement (see our Memorandum and Order, April 24, 1981, unpublished), there seem to be no parties before us and we seem to lack jurisdiction. (See Section II of this decision, formally dismissing two parties that are not part of the settlement agreement but that sought to withdraw from this case earlier.)

Despite our apparent lack of jurisdiction, we have reviewed the settlement documents to see whether there is any lack of fairness. See 10 CFR §2.759 (encouraging fair and reasonable settlements). A reason we undertook that review was that the Atomic Energy Act anticipates that we will apply the purposes of the antitrust laws, and courts acting pursuant to those laws have jurisdiction to approve or disapprove proposed settlement agreements under the Tunney Act (the Antitrust Procedures and Penalties Act of 1974). See *U.S. v. American Telephone and Telegraph Co., et al.*, U.S. District Court, District of Columbia, Case No. 74-1698 (D.D.C.) 1982-1 *Trade Cases* ¶64,465 (January 12, 1982) at 72,610-611. However, that act has only suggestive authority here, and our review of the settlement agreement failed to disclose any egregious unfairness; hence, we have decided not to pursue further, on our own motion, the question of whether the proposed settlement is in the public interest. Compare Clayton Act, 15 U.S.C. §5.(b). In this case, consideration by us of whether the settlement is in the public interest seems particularly unnecessary both because there was an earlier settlement approved in this case after notice of the agreement was given to the public and because the settlement before us also is before a federal district court, which will approve or disapprove of the settlement pursuant to principles which differ little from those we would apply. (Were the court to reject the settlement, we might then need to reconsider our decision to dismiss the proceeding.)

We are not impressed by RRD's argument that our prior decisions provide it with a right to contest the remedies to be made available in this case and that our own decisions therefore stand in the way of accepting this settlement. First, we note that the Appeal Board affirmed our finding that RRD has failed to show that its complaint has a nexus to this proceeding. ALAB-665, 15 NRC 32-33 (1982). The principal deficiency in its case is that it failed to show that the activities for which a license is sought would "play an active role in creating or maintaining the anticompetitive situation." *Id.* at 32.

We reject RRD's complaint that "the Board's grant to Parsons & Whittemore of status to participate at the remedial stage of the proceedings as *amicus curiae* could have served no useful purpose." First, our grant of *amicus* status gave RRD the opportunity to demonstrate that we should not accept the settlement placed before us in this case. Second, the grant of *amicus* status anticipated a continuing contest over the appropriate relief to be granted in this case; and *amicus* status would under

those circumstances have provided an opportunity for RRD to attempt to affect the Board's decision to its advantage. That RRD has been unable to use its *amicus* status to advance its underlying interests does not demonstrate that the initial grant "could have served no useful purpose."

For these reasons, the motion to dismiss is granted.

II. EARLIER MOTIONS TO WITHDRAW

The Orlando Utilities Commission moved to withdraw from this proceeding on June 20, 1980 and the Gainesville Utilities Department moved to withdraw on August 4, 1981. Since there are no reasons to refuse these motions, they are granted.

III. MOTION TO VACATE

FPL and Cities have requested that our Memorandum and Order Concerning Florida Cities' Motion for Summary Disposition on the Merits, dated December 11, 1981 (LBP-81-58, 14 NRC 1167) should be vacated. They argue by analogy to established federal practice that when an appeal becomes moot it is appropriate to vacate the trial court's decision. *United States v. Munsingwear*, 340 U.S. 36, 39 (1950).

We accept this argument as valid. Moreover, our decision of December 11, 1981, was tentative, being left open by us for further objection by the parties. Given the preliminary nature of that opinion and the agreement of the parties not to contest it, that opinion ought to be vacated. It is our duty to adjudicate disputes and not to stand in the way of settlements by refusing a reasonable request to vacate our order.

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is this 24th day of March, 1982,

ORDERED

(1) The motions to withdraw from this proceeding filed on June 20, 1980, by the Orlando Utilities Commission and on August 4, 1981, by the Gainesville Utilities Department, are granted.

(2) Our Memorandum and Order of December 11, 1981, (LBP-81-58) is vacated.

(3) This proceeding is dismissed.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

**Michael A. Duggan
ADMINISTRATIVE JUDGE**

**Robert M. Lazo
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Charles Bechhoefer, Chairman
Dr. James C. Lamb
Mr. Ernest E. Hill**

In the Matter of

**Docket Nos. STN 50-498 OL
STN 50-499 OL**

**HOUSTON LIGHTING AND POWER
COMPANY, et al.
(South Texas Project, Units 1
and 2)**

March 26, 1982

The Licensing Board denies intervenors' request for disclosure by sworn affidavit of the substance of any and all *ex parte* communications alleged to have occurred as a result of NRC Commissioners' visits to the site of the South Texas facility.

RULES OF PRACTICE: EX PARTE COMMUNICATIONS

Intervenors' request for identification of all persons involved in arranging the visits of NRC Commissioners to the site of the South Texas facility, and for sworn affidavits from each such person, was essentially a request for discovery. As such, it was required to be relevant to some contention or question before the Licensing Board. Because intervenors had not demonstrated that any *ex parte* contacts actually took place and had alleged no *ex parte* contacts by the Licensing Board itself, the request was not relevant to the proceeding before the Board and would be denied.

MEMORANDUM AND ORDER

Denying CEU Motion To Require Full Disclosure and Independently Prepared Affidavits)

On March 1, 1982, Citizens for Equitable Utilities (CEU), an intervenor in this operating-license proceeding, filed a motion seeking relief as a

result of certain alleged *ex parte* contacts which are said to have resulted from visits to the site of the South Texas facility undertaken (on separate occasions) by Commissioners Gilinsky and Roberts. CEU claims that it was not notified of Commissioner Gilinsky's visit and, although it was advised on very short notice of Commissioner Roberts' visit and was invited to participate, Commissioner Roberts was delayed and did not begin his visit until several hours after the stated time for the visit, resulting in a missed connection between Commissioner Roberts and CEU's representative.

CEU opines that HL&P, the Staff, and the Commissioners "apparently engaged in extensive *ex parte* communications", in violation of 10 CFR §2.780. As "interim remedies", it asks us to require HL&P and the NRC Staff to identify persons involved in arranging the visits and in the visits themselves, all contacts between such persons, and the substance of any communications. CEU seeks separate sworn affidavits from each such person, prepared independently and without review by any other person. CEU also has written Commissioners Gilinsky and Roberts seeking other relief as a result of the site visits in question.

Citizens Concerned About Nuclear Power (CCANP), another intervenor, supports CEU's motion, adding that it too had "totally inadequate" notice of Commissioner Roberts' visit. CCANP additionally has written Commissioner Roberts seeking further relief.

The Applicants and NRC Staff oppose the motion before us. Each of them takes the position that we have no jurisdiction to grant the relief requested or, in any event, that the relief requested is not appropriate for the conduct in question or consistent with NRC regulations. The Staff additionally stresses that CEU has made no showing that anyone engaged in *ex parte* communications, pointing out that Commissioners have duties other than adjudicatory with respect to any given facility.

We agree with the Applicants and Staff that CEU's motion must be denied, but on somewhat different grounds.¹ What is being sought is essentially a form of discovery. This type of relief is inconsistent with the self-policing remedy provided by NRC Rules for *ex parte* contacts. 10 CFR §2.780.² But even on its own terms, the requirements for discovery

¹ The jurisdictional issue raised by the Applicants and Staff presents a close question, upon which we decline to rule. We note that there may well be a difference between our authority to explore the conduct of Commissioners (which is discussed by the Applicants and Staff) and our authority to inquire into the conduct, including associations with other persons, of various parties before us. In any event, we have jurisdiction to take the action which we take by this Memorandum and Order. Cf. *Duke Power Co.* (Perkins Nuclear Station, Units 1-3), ALAB-591, 11 NRC 741 (1980).

² In that connection, we have been served with a note from Commissioner Gilinsky to all parties to this proceeding, dated March 23, 1982, concerning his December, 1981 site visit.

have not been met. Discovery must be relevant to some contention or question before us. 10 CFR §2.740(b)(1); *cf.* 10 CFR §2.720(a). CEU has not demonstrated either that any *ex parte* contacts took place or, assuming they did, how such contacts by certain Commissioners could have a bearing on any determination which we are called upon to make in any of the phases of this proceeding. No *ex parte* contacts by this Board are alleged. Any determinations we make in this proceeding will be our own, based on the record before us, and will be unaffected by any activities engaged in by individual Commissioners.

For the above reasons, it is, this 26th day of March, 1982,

ORDERED

That CEU's Motion To Require Full Disclosure And Independently Prepared Affidavits is *denied*.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Charles Bechhoefer, Chairman
ADMINISTRATIVE JUDGE**

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Louis J. Carter, Chairman
Frederick J. Shon
Dr. Oscar H. Paris

In the Matter of

**Docket Nos. 50-247 SP
50-286 SP**

**CONSOLIDATED EDISON
COMPANY OF NEW YORK
(Indian Point, Unit 2)**

**POWER AUTHORITY OF THE
STATE OF NEW YORK
(Indian Point, Unit 3)**

March 29, 1982

The Licensing Board denies licensees' motion in the alternative for a stay of the Commission's orders governing the proceeding, for dismissal of the proceeding, or for certification of issues to the Commission.

LICENSING BOARDS: JURISDICTION

Licensing Boards exercise only those powers which the Commission has given them. Where the Commission's only direction to the Licensing Board in this proceeding was to formulate recommendations on the questions posed in the Commission's order, the Commission did not delegate to the Board the power to issue a stay.

LICENSING BOARDS: AUTHORITY

Where virtually the same arguments as those contained in licensees' motion had previously been presented to, and rejected by the Commission, a Licensing Board decision reversing the prior decision of the Commission

would make a mockery of the Board's obligation to follow Commission precedent.

RULES OF PRACTICE: CERTIFICATION OF ISSUES TO THE COMMISSION

The Licensing Board's power to certify issues to the Commission is discretionary and is to be exercised sparingly. Where licensees' motion to certify presented no novel questions of policy, law or procedure, and no other compelling reasons for certification, the motion would be denied.

MEMORANDUM AND ORDER

(Ruling on Licensees' Motion for Stay of Commission's Orders of January 8, 1981 and September 18, 1981)

On November 25, 1981, Consolidated Edison Company of New York Inc. and the Power Authority of the State of New York, Licensees of Indian Point Units 2 and 3 respectively, (hereinafter Licensees) filed "Licensees' Motion For a Stay Of Commission's Orders Of January 8, 1981 And September 18, 1981 Or For Dismissal Of This Proceeding Or, In the Alternative, For Certification To The Commission."¹ Responses to that motion were filed by Robert Abrams, Attorney General of the State of New York, the Union of Concerned Scientists (UCS) and New York Public Interest Research Group (NYPIRG), and the NRC Staff.

We hold that the motion is denied and that the issue is not certified to the Commission.

I

Movants argue that commencement of an adjudicatory proceeding prior to completion of ongoing proceedings to establish generic standards constitutes a denial to Licensees of procedural due process. In support of this, Licensees argue:

(1) that Congress in the NRC Appropriation Act of 1980 directed the NRC to proceed with the establishment of a comprehensive plan to set standards for the evaluation of the safety of all operating nuclear plants;

¹ Licensee also filed a memorandum of Law in support of their motion. The latter contained 5 pages, the former 61 pages. Had this been an application for a stay after a decision of this Board it would have been limited to ten (10) pages exclusive of affidavits, 10 CFR §2.788(b). "Praised be he who can state a cause in clear, simple manner, and then stop." Belt J., *Jungewirth v. Jungewirth*, 115 Or. 668, 672 (1925).

(2) that agencies should use their rulemaking powers in lieu of adjudication;

(3) that Licensees have been given no notice of what new level of safety will be acceptable for Indian Point or "fair notice of warning" of what is acceptable so they may act accordingly; and

(4) that the proposed proceeding "permits and encourages an arbitrary and discriminatory enforcement of the law".

The Attorney General and Staff correctly assert that many of these arguments were raised with the Commission in 1979 and reasserted again in 1980 but to no avail, all having been rejected by the Commission.²

II

Staff and the Attorney General argue that the Board does not have the power to order a stay of the Commission's orders or a dismissal of this proceeding where to do so would fly in the face of the clear intent of the Commission. This position is likewise advanced by Staff and UCS arguing further that "licensing boards are delegates of the Commission and exercise only those powers which the Commission has given them" citing *Public Service Co. of Indiana Inc.* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-316, 3 NRC 167, 170 (1976), *Northern Indiana Public Service Co.* (Bailly Generating Station Nuclear 1), ALAB-249, 8 AEC 980, 987 (1974). *Houston Light and Power* (South Texas Units 1 and 2), ALAB-381, 5 NRC 582 (1977). Thus, the entire case cannot be disposed of by the Board when it has been instructed not to make an initial decision, but instead to formulate recommendations to the Commission.

We have canvassed the cases cited and agree that their holdings are controlling. See also *Carolina P&L Co.* (Shearon Harris Nuclear Power Plant, Units 1-4), ALAB-526, 9 NRC 122, 124 (1979); *Portland General Electric Co.* (Trojan Nuclear Plant), ALAB-534, 9 NRC 287, 289-90 at n. 6 (1979).

Staff believes that the Commission's order is clear: that the only direction this Board was given was to formulate recommendations on the questions posed in its order of September 18, 1981, CLI-81-1, as revised, at 5 n. 4 and 8.

² *Consolidated Edison Company of New York* (Indian Point, Unit 2) and *Power Authority of the State of New York* (Indian Point, Unit 3) CLI-81-1, 13 NRC 1 (1981); CLI-81-23, 14 NRC 610 (1981).

We hold that the Commission did not delegate to this Board the power to issue a stay.³

Staff also asserts that the Commission alone is the proper forum for a request for a stay, citing 10 CFR §2.788(f)⁴ and statements of consideration to Part 2 entitled "Commission Review of Appeal Board Decisions and Procedure for Requests for Stays", 42 Fed. Reg. 22128 (May 2, 1977). Staff argues that the issue of a stay must be presented to the "deciding body", viz., the Commission which initiated this proceeding. In this case, the proper forum for this application is the Commission.

It is absurd to suggest that a Board could reverse a prior decision of the Commission made in the same case on virtually the same motion. Such a result would make a mockery of the Board's obligation to follow Commission precedent. See *Virginia Electric and Power Company*, (North Anna Nuclear Power Station, Units 1 and 2), ALAB-584, 11 NRC 451, 465 (1980).

III

On the question of our power to certify this issue to the Commission we find that though we have the power to do so, 10 CFR §2.718(i), we shall not. The power is discretionary and is to be exercised sparingly. Though Part 2 rules do not specifically articulate any standard for Licensing Boards, Appendix A, Part V(f)(4) restates the standard applicable to the Appeal Board in §2.785(d). The Statement of Policy provides that a Licensing Board may in its discretion certify to the Commission for its determination "major or novel questions of policy law or procedure." We find none present here.

Nor does there appear to be any compelling reason⁵ in this case for certification. In fact, as Staff asserts there exists a compelling interest for this Board to proceed with the development of the record to enable it to meet the September 18, 1982 date for this Board's recommendations.

³ A Licensing Board has the power, in the first instance, to rule on the scope of its jurisdiction, see *Kansas Gas and Electric Co.*, (Wolf Creek Nuclear Generation Station, Unit 1), ALAB-321, 3 NRC 293, 298 (1976), aff'd CLI-77-1, 5 NRC 1 (1977).

⁴ 10 CFR §2.788(f) provides:

(f) An application to the Commission for a stay of a decision or action by an Atomic Safety and Licensing Appeal Board will be denied if a stay was not, but could have been, sought before the Appeal Board. An application for a stay of a decision or action of a presiding officer may be filed before either the Atomic Safety and Licensing Appeal Board or the presiding officer, but not both at the same time.

⁵ See *Vermont Yankee Nuclear Power Corporation*, (Vermont Yankee Nuclear Power Station), ALAB-211, 7 AEC 982, 984 (1974).

IV

We have considered all other arguments of the Licensees and find they are without merit.

It is, this 29th day of March, 1982

ORDERED

That Licensees' Motion for a Stay of Commission's Orders of January 8, 1981 and September 18, 1981 or For Dismissal of this Proceeding or, in the Alternative for Certification to the Commission is *denied*.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

Oscar H. Paris
ADMINISTRATIVE JUDGE

Frederick J. Shon
ADMINISTRATIVE JUDGE

Louis J. Carter, Chairman
ADMINISTRATIVE JUDGE

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Louis J. Carter, Chairman
Ernest H. Hill
Dr. David R. Schink

In the Matter of

Docket No. 30-6931

**ARMED FORCES RADIOBIOLOGY
RESEARCH INSTITUTE
(Cobalt-60 Storage Facility)**

March 31, 1982

The Licensing Board rules that notions of elementary fairness require consideration of an untimely petition to intervene and request for hearing where the late filing may have resulted from petitioner's reliance on NRC Staff representations, but denies the petition for lack of standing.

BY-PRODUCT MATERIALS LICENSES: RULES APPLICABLE TO

Pursuant to 10 CFR 30.34, by-product materials licenses are subject to the provisions of the Atomic Energy Act of 1954, as amended, as well as to all valid rules, regulations and orders of the Commission.

BY-PRODUCTS MATERIAL LICENSE: RULES APPLICABLE TO

By its terms, §2.700 of the Commission's Rules of Practice does not contemplate that the provisions of §2.714 relating to the timeliness of intervention petitions should apply to materials licenses issued pursuant to 10 CFR 2.103 and 10 CFR, Part 30, unless the Commission orders that a hearing be held or determines that an opportunity for a public hearing should be afforded.

BY-PRODUCT MATERIALS LICENSE: RENEWAL; REQUIREMENT OF HEARING

Section 2.103 of the Commission's Rules of Practice provides that the Director of Nuclear Reactor Regulation or the Director of Nuclear Materials Safety and Safeguards may issue a license if it finds that the application complies with the requirements of the Atomic Energy Act and the Commission's regulations, and restricts the right to a hearing to an Applicant who has been notified of a denial of the application. Consequently, the issuance of a by-product materials license renewal is not a proceeding under the Atomic Energy Act of 1954, as amended, §189(a), 42 USC 2239(a), and a hearing is not required before the license is renewed.

RULES OF PRACTICE: UNTIMELY INTERVENTION PETITION

Where petitioner's counsel alleged that Commission Staff had represented to her that no action would be taken on licensee's application for renewal of its by-product materials license until completion of pending reactor licensing proceedings to which petitioner was a party, and such allegations were not denied by Staff, the action of Staff could be asserted as an estoppel on the issue of the timeliness of petitioner's petition for leave to intervene.

RULES OF PRACTICE: UNTIMELY INTERVENTION PETITION

Where petitioner relied to its detriment on Staff's representations, notions of elementary fairness required that its petition to intervene be considered even though it was filed after the issuance of the license renewal to which it pertained.

RULES OF PRACTICE: STANDING

Although an organization may establish standing through its members, it must allege a potential injury which is particularized to it and not one which is shared in substantially equal measure by all of a large class of citizens.

RULES OF PRACTICE: STANDING

Since the Cobalt facility that was the subject of this petition did not have the potential for accidental release of fission products, the proximity nexus for establishment of standing in nuclear reactor proceedings was not applicable here. Since petitioner's only allegation of injury to its members was proximity to the Cobalt facility, it failed to establish standing and its petition was denied.

MEMORANDUM AND ORDER (RESOLVING ISSUES RAISED BY PETITION FOR LEAVE TO INTERVENE)

On July 28, 1981, the Director of Nuclear Material Safety and Safeguards granted the application of the Armed Forces Radiobiology Research Institute (AFRRI), filed August 28, 1980, for renewal of its By-Products Material License No. 19-08330-03 under 10 CFR Part 30. The license (amendment 14), as renewed, allows for the storage of Cobalt-60 in the AFRRI facility on the grounds of the National Naval Medical Center in Bethesda, Maryland, until July 31, 1986.

On August 31, 1981, the Citizens for Nuclear Reactor Safety, Inc. (CNRS) filed a Petition for Leave to Intervene requesting a hearing on this licensing action. CNRS is an intervenor in the ongoing proceeding for the renewal of the operating license for the TRIGA reactor located at the AFRRI facility in Bethesda. See Docket 50-170 OL. Just prior thereto, on August 7, 1981, CNRS' counsel wrote to the Commission's Secretary, requesting that the Commission grant a hearing on the materials license application and to consolidate it with the operating license proceeding. The Board considers that letter as having merged into the Petition for Leave to Intervene.

By order dated October 8, 1981, the Commission directed the Chairman of the Atomic Safety and Licensing Board Panel (ASLBP) to designate a board to review the CNRS' Intervention Petition, to determine whether the hearing requirements of section 189(a) of the Atomic Energy Act of 1954, as amended, 42 U.S.C. §2239(a), and 10 CFR §2.714 of the Commission's regulations have been met and, if so, to conduct an appropriate licensing proceeding under Parts 2 and 30 of the Commission's rules. Pursuant to this order, this Board was established by an Order of the Chairman and Chief Administrative Judge of the ASLBP dated October 13, 1981, to rule on the aforementioned Intervention Petition. (46 *Fed. Reg.* 51516)

Pursuant to said Order, this Board was directed to determine

- (1) whether the hearing requirements of section 189(a) of the Atomic

Energy Act, 42 U.S.C. §2239(a), and 10 CFR §2.714 of the Commission's regulations have been met;

(2) whether the petition must be denied because the instant proceeding terminated when the license was renewed on July 28, 1981; and

(3) whether the staff had timely notice of the petitioner's interest in obtaining a hearing in this case.

Section 189(a), *supra* provides in pertinent part, that:

In any proceeding under this Act, for the granting, suspending, revoking or amending of any license . . . the Commission shall grant a hearing upon the request of any person whose interest may be affected by the proceeding . . .

Pursuant to 10 CFR §30.34, each license issued under Part 30 of the Commission's regulations is made subject to the provisions of the Act, as well as to all valid rules, regulations and orders of the Commission.

In Licensee's view, the first three words of section 189(a), "In any proceeding", are crucial to the determination of whether petitioner may intervene, as of right, Licensee contending that the issuance of its license renewal terminated these proceedings, thus terminating any rights of CNRS to intervene under that section. Under that interpretation, the CNRS petition can, according to Licensee, only be considered as a request to institute a proceeding during the term of a license, under the standards set out in sections 186, "Revocation," and 187, "Modification of License," of the Act, §42 U.S.C. §§2236 and 2237, respectively, and 10 CFR §§2.206 and 30.61. Licensee contends CNRS has not met the requirements of either of these sections and is therefore not entitled to a hearing. We agree that the requirements of sections 186 and 187 have not been met.¹

CNRS does not address the question of the timeliness of its attempt to intervene, either in its August 29, 1981 petition, or in its August 7, 1981 letter to Commission's Secretary. Counsel for CNRS stated in that letter, that she had discussed the pendency of Licensee's Cobalt-60 storage license renewal in a telephone conversation with one John Hickey of the NRC's Materials Licensing Branch on February 4, 1981, and had been told at that time that Mr. Hickey had not yet assigned the review of that license to anyone. Mr. Hickey is alleged to have stated his intention to delay making any decision on the Cobalt-60 storage renewal until the completion of the AFRRI reactor licensing proceedings, since some of the issues being litigated there also relate to the Cobalt storage license. These allegations

¹ In general, Section 186 involves revocation for material false statements or facts or conditions that would warrant refusal of the original application, or failure to construct or operate in accord with the terms of the permit or license. Section 187 permits amendment, revision or a modification of the act or rules and regulations issued in accordance with the terms of the act.

concerning Mr. Hickey's representations are not denied by Staff nor does Staff argue that the petition is untimely.

Petitioner's counsel also stated in her August 7, 1981 letter that she had learned, only the day before, that the NRC "plans to take first action on the application to renew License No. 19-08330-03 before the reactor proceedings were completed," and noted that "since notice of proposed actions on materials license application is not published in the *Federal Register*, counsel cannot determine when and what the final decisions will be."

Licensee responds by urging that this Board consider the letter as an admission by CNRS that it had actual notice of the proceedings on the renewal of AFRRI's by-products material license not later than February 4, 1981, and argues that no hearing should be granted where a would-be intervenor had actual notice of the proceeding prior to the determination. This rule is proposed to apply even if the failure to publish notices of proposed actions in the Federal Register might otherwise be considered a denial of procedural due process.

This Board is unaware of any NRC decision which has defined the time frame within which petitions to intervene in domestic materials license proceedings must be filed. Nor is this Board aware of any precedent which has squarely addressed the issue of whether the Commission's failure to provide notice of pending domestic materials licensing applications in the Federal Register would constitute a violation of procedural due process, such as to suggest that the untimeliness of an intervention petition in such proceedings ought to be excused.²

The Commission's general rule as to timeliness of an intervention petition is set forth in 10 CFR §2.714 (a)(1), which provides, in pertinent part,

that [t]he petition and/or request [for leave to intervene] shall be filed not later than the time specified in the notice of hearing, or as provided by the Commission, the presiding officer of the atomic safety and licensing board designated to rule on the petition and/or request, or as provided in §2.102 (d)(3) (relating to hearings on antitrust matters).³

² Because of their frequency, low individual impact, and the historical absence of controversy regarding them, materials licenses have not been noticed in the Federal Register, see *Edlow International Company* CLI-76-6, 3 NRC 563 at 579 nor does such appear to be required under 10 CFR Part 2.

³ The subsection also sets forth factors which may be balanced in determining whether a nontimely filing should be entertained. This rule, however, has been interpreted by the Commission to "assume that procedures for convening a hearing have already been commenced."

On the basis of the foregoing language, staff argues that this rule does not govern the timeliness of an intervention petition in an action such as this, where the license was issued by the Director of Nuclear Material Safety and Safeguards. See *Edlow International Company* (Agent for the Government of India on Application to Export Special Nuclear Material) CLI-76-61, 3 NRC 563, 579 (1976).

Furthermore, 10 CFR §2.700, which describes the scope of "Subpart G Rules of General Applicability" of the Commission's regulations (of which §2.714 is a part) states only that the provisions of this subpart are to govern [certain] procedures in adjudications, via those initiated by the issuance of an order to show cause, pursuant to 10 CFR §2.202; an order directing a hearing relating to the imposition of civil penalties, pursuant to 10 CFR §2.205 (e); a notice of hearing, pursuant to 10 CFR §2.104; a notice of proposed action, pursuant to 10 CFR §2.105 or a notice of hearing on antitrust matters, pursuant to 10 CFR §2.102(d)(3). By its very terms, then 10 CFR §2.700 does not contemplate that the provisions of §2.714 relating to the timeliness of intervention petitions should apply to materials licenses issued pursuant to §10 CFR §2.103⁴ and Part 30, unless the Commission orders that a hearing be held pursuant to 10 CFR §2.104, having found that such a hearing would be in the public interest, or unless the Commission, pursuant to 10 CFR §2.105 (a)(4), "determines that an opportunity for a public hearing should be afforded."

Simply stated, it is the board's opinion that the issuance of the license renewal is not a "proceeding" under the act and that under §189(a) it need not hold a hearing *before* the license is renewed. See *People of the State of Illinois v. NRC* 591 F.2d 12, (1979) holding that the Atomic Energy Act gave Illinois no right to a hearing by the Commission of a "Request to Institute a Proceeding and Motion to Modify, Suspend or Revoke Special Nuclear Material License" where no formal proceeding had begun, for granting, suspending or revoking the license.⁵

We think, however, that this case differs from the Illinois case since a fair interpretation of the facts indicates that staff indicated to petitioner that this material license would be consolidated with the ongoing proceeding making the operating license. In *Illinois* the opposite occurred, there

⁴ Section 2.103 which prescribes the action to be taken on applications for by-product material license simply provides that the Director of Nuclear Reactor Regulation or the Director of Nuclear Material Safety and Safeguards may issue a license if it found that the application complies with the requirements of the Act and the regulations. The right to a hearing under this section is limited to an applicant who has been notified of a denial of the application.

⁵ While *Sholly v. NRC*, US App. D.C. 651 F.2d 780, 11/19/80 cert. granted 5/26/81, would appear to hold that a request for a hearing is sufficient under section 189(a) we believe that ruling applies only with regard to significant changes in the operation of a nuclear facility and not to material licensing.

complying with 10 CFR §2.206 (b) and Section 555 (e) of the APA, the Director of Nuclear Material Safety and Safeguards advised the State of Illinois that no proceeding would be instituted.

We hold also that the issue of timeliness is not determinative even though the Petition for Leave to Intervene was filed after the issuance of the license because justice and fair play require consideration of the petition. The representation of staff to intervenor's counsel has not been denied. The action of staff, we hold, is an estoppel that may be asserted—even against the government. We think petitioners relied to their detriment on staff's representations. To hold otherwise would violate our notions of "elementary fairness" *Moser v. United States* 341 U.S. 41 at 47, 71 S.Ct 553, 95 L. Ed 729 (1951); *USA v. Lazy FC Ranch* 481 F.2d 985 (1973). See also *Wisconsin Public Service Corporation, Kewaunee Nuclear Power Plant*, LBP-78-24, 8 NRC 78 (1978) where our brethren held that confusing and misleading letters from the staff to a prospective *pro se* petitioner for intervention and the failure of the staff to respond in a timely fashion to certain communications from such a petitioner, constituted a strong showing of good cause for an untimely petition.

Thus, under the compelling circumstances⁶ of this case we believe petitioner should have opportunity to be heard if petitioner has the requisite standing.

In the related operating license proceeding (Docket 50-170), the petitioner was granted the right to intervene where members were identified who lived 0.3 to 4.6 miles from the site of the reactor. An organization such as CNRS can establish standing through its members. Here, protection of the members is within the "zone of interests" and staff does not dispute this concern for the protection of the health and safety of its members. Not every risk with which the Commission is substantially concerned is *perforce*, one which must be deemed to create standing in some member of the public. It is necessary to determine whether or not petitioners have alleged a potential injury which is particularized to the individual petitioner and not one which is "shared in substantially equal measure by all of a large class of citizens" *Edlow International Company* supra at 576 citing *Warth v. Seldin* 422 US 490, 499 (1975). See also *Houston Lighting and Power Company* (Allens Creek Nuclear Generating Station Unit 1), ALAB 535, 9 NRC 377, 390 (1979).

We believe that petitioners have failed to make such particularized contention.

A general description of the nature of cobalt storage may assist in understanding why this is so.

⁶ See *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc.* 435 US 519, at 543, 98 S Ct. 1197, at 1211, 55 L Ed 2d 4601 (1978).

Unlike reactors, which generate fission products and have the potential for airborne and waterborne effluent releases, cobalt-60 in a facility, such as this, serves only as a source of gamma radiation. We can conceive of no pathway by which either airborne or waterborne contaminants could be released to adversely affect members of the public.

The cobalt-60 source is maintained within water and concrete shielded structures to protect the workers in the facility. If the shielding were to in some way be lost, the intensity of the gamma radiation is reduced very rapidly by distance. At a distance of 300 meters the dose rate would be reduced to a very low safe level (10-100 mr/hr). At 600 meters (0.4 miles) it would be reduced to the level allowed for a worker in a restricted area (2.5 mr/hr 10 CFR 20). At 2000 meters (1.25 miles) it would be reduced to the level allowed for a person in an unrestricted area (0.25 mr/hr 10 CFR 20) and at 3 to 5 miles it would be reduced to approximately background level.

Thus there is no mechanism by which the AFRRRI Cobalt-60 facility could possibly cause gamma radiation exposure to members of the public residing at distances of 3 to 5 miles.

The petitioner alleges as an injury only proximity of the cobalt facility to its members. Unlike the proximity nexus of nuclear reactor proceedings where accidental fission product release from the reactor may occur such cannot here occur because of the wholly dissimilar nature of a cobalt facility. Reactors may generate fission products and do have the potential for airborne and waterborne effluent releases while the cobalt in this facility does not produce that effect since it is used only as a gamma irradiator. In summary, this is staff's position and we agree.

Petitioner argument that there is a hazard of low level gamma radiation which will emanate from the storage facility is not supported by the physical facts of the nature of the facility.

The further allegation of interest relating to the issues of emergency planning building access and security are not sufficiently particularized. To assume, arguendo, that petitioner is correct, any order which may be entered in the licensing proceeding will affect the cobalt facility located within the same building.

In conclusion, we determine the answers to the issues raised by the Commission in its October 13, 1981 order as follows:

(1)(a) The requirements of section 189(a) of the Atomic Energy Act 42 USC 82239(a) have not been met since the renewal of a by-products material license is not a "proceeding".

(1)(b) The requirements of 10 CFR §2.714 have not been met because the petitioners has failed to make at least one particularized contention alleging a potential injury which is not shared in substantially equal measure by a large class of citizens.

(2) The petition if otherwise sufficient for reasons of standing would not be denied on the grounds that the instant proceeding terminated because (a) the license renewal is not a proceeding and (b) even if considered a terminated proceeding there were sufficient grounds based on reasons of elementary fairness or estoppel to permit a hearing.

(3) The staff, in the board's view, had timely notice of the petitioner's interest in obtaining a hearing in this case, but for petitioner's lack of standing this was of no significant consequence in this case.

Therefore, it is this 31st day of March 1982

ORDERED

That the petition for a hearing is denied.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Louis J. Carter, Chairman
ADMINISTRATIVE JUDGE**

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Peter B. Bloch, Chairman
Jerry R. Kline
Hugh C. Paxton

In the Matter of

Docket Nos. 50-266-OLA
50-301-OLA

**WISCONSIN ELECTRIC POWER
COMPANY**

(Point Beach Nuclear Power
Plant, Units 1 and 2)

March 31, 1982

The Licensing Board denies a motion to reconsider its previous decision not to certify a *sua sponte* question to the Commission.

LICENSING BOARDS: *SUA SPONTE* ISSUES

The regulations limiting the Board's authority to raise *sua sponte* issues restrict its right to consider safety, environmental or defense matters not raised by parties but does not restrict its responsibility to oversee the fairness and efficiency of proceedings and to raise important procedural questions on its own motion.

The Commission's direction to Boards to notify it of *sua sponte* matters does not create rights in private parties.

RULES OF PRACTICE: PROPRIETARY DETERMINATIONS

A Board may raise a procedural question, such as whether a portion of its record should be treated as proprietary or should be released to the public, regardless of whether the full scope of the question has been raised by a party.

MEMORANDUM AND ORDER
(Concerning Reconsideration of Our Denial
Of a Motion to Certify a *Sua Sponte* Question)

On March 9, 1982, Westinghouse Electric Corporation (Westinghouse) moved for reconsideration of our Memorandum and Order of February 26, 1982, in which we denied its motion to certify a *sua sponte* question to the Commission. Wisconsin Electric Power Company (applicant) supported this motion in a filing of March 24, 1982. Staff has not filed. Wisconsin's Environmental Decade (Decade) commented in a March 12, 1982 letter:

In addition to the legal arguments against the substance of Westinghouse's claims, the issue is now completely moot in light of our having challenged the confidentiality of the matters previously only challenged by the Board.

We agree with Decade that the motion deserves to be summarily denied, for reasons previously stated. We also find that the issue is moot and that there are no remaining *sua sponte* issues because Decade has expressed its interest in each issue in which the Board is interested.

However, we find that applicant's filing managed to raise a few issues in a manner that has not been addressed directly to this time and that a few more explanatory words may be appropriate. In particular, we will clarify the extent of our interest in the confidentiality issue, along lines suggested by applicant, which stated that if "the Board's actual inquiry is limited to the issue raised by the Intervenor, [its] concerns regarding the adverse impact on its interests will be substantially assuaged." Answer at 3. We also will comment on the validity of our observation that the *sua sponte* rule affects the substantive inquiries of the Board but does not restrict its procedural authority.

I. SCOPE OF THE BOARD'S INTEREST

The Board has already issued a decision concerning the confidentiality of an affidavit that we previously styled the Wiesemann affidavit. Westinghouse considers that this action was *sua sponte*; however, that action is completed, is subject to appeal, and has no further effect on this proceeding.

The principal issue Decade has raised is whether or not a portion of our record dealing with safety tests performed by Westinghouse should be released to the public. The Board's present interest is limited to that issue, although our concern may extend beyond the initial periphery of that issue as defined by Decade. At first, Decade limited its interest to certain sections of the Westinghouse Sleeving report. We stated, however, that our interest might include related materials in the appendices. Decade has

subsequently extended its interests to parallel ours. We believe that this slight extension of Decade's initial interests is clearly within the Board's prerogatives, whether or not Decade agreed to take up the issues in its own right. However, Decade's interest makes it moot as to whether this was initially a *sua sponte* issue.

II. PROCEDURAL VERSUS SUBSTANTIVE

Applicant challenges the Board's assertion that the *sua sponte* rule affects its authority to pursue substantive issues but not its authority to issue necessary procedural determinations. Applicant argues that we have not adequately explained our use of the term "procedural" and that the Supreme Court has defined a substantive rule as one "affecting individual rights and obligations." *Morton v. Ruiz*, 441 U.S. 199, 232 (1974).

We find applicant's effort to define "procedural" to be wholly without merit, but we are grateful to it for providing us with this opportunity to more fully expound our views on why a confidentiality issue is procedural rather than substantive. The issue is among the thorniest in law. Indeed, in some law schools it is the first and often the most confusing issue taught to first year law school students, who must study *Sibbach v. Wilson & Co.*, 1941, 62 S.Ct. 422, 312 U.S. 1, 85 L.Ed. 479. See also Charles Alan Wright, *Federal Courts*, 1963 at 225, footnote 20.

In *Sibbach* the court upheld the federal rules of civil procedure against a challenge that a particular rule was substantive and not procedural and that the rule was therefore barred by the terms of the enabling act pursuant to which the rules had been issued. The particular rule whose validity was challenged had been interpreted by the lower courts to require that plaintiff be jailed for contempt for failing to take physical examination pursuant to court order. In its discussion, the majority concluded that the rule involved was procedural and that it was valid even if it had such an important effect as requiring incarceration. However, the majority also found that the proper result (which also was procedural) was the dismissal of plaintiff's action if she would not be examined, rather than the extreme penalty of imprisoning the plaintiff. Hence, we find that an issue can be *procedural* even if its effect is to dismiss the entire action and determine its result.

The core of *Sibbach* is instructive here:

If we were to adopt the suggested criterion of the importance of the alleged right we should invite endless litigation and confusion worse confounded. The test must be whether a rule really regulates procedure, —the judicial process for enforcing rights and duties recognized by substantive law and for justly administering remedy and redress for disregard or infraction of them.

Id. 312 U.S. at 14, 85 L.Ed. at 485. At first blush, the rule appears to be somewhat circular, testimony to the difficulty of this definitional problem. However, the circularity is not complete. Application of this rule to Commission cases suggests that if an issue relates to a safety, environmental or common defense matter then it is substantive. Such issues are the meat and potatoes of our proceedings. They are the underlying issues which have a direct effect on whether a license should be issued.

When an issue does not relate to safety, the environment or common defense, it is unlikely to be substantive. If it relates to the methods by which such substantive issues are determined, it is procedural. Hence, rulings on scheduling matters, discoverability, the order of presentations, sanctions for violation of Board rulings and the like are all procedural. Included in this procedural category, because it relates to the fairness of the way in which substantive issues are decided, are issues related to the completeness and public availability of the record of this proceeding. We come to such issues because of our responsibility to govern the proceeding fairly. Though such issues may be crucial to the parties, they are nevertheless procedural.¹

III. STANDING TO DEMAND COMPLIANCE WITH *SUA SPONTE* MEMORANDUM

In conclusion, we call into question whether the memorandum of June 30, 1981, from Samuel J. Chilk to the Chairman of the Atomic Safety and Licensing Board Panel and to others creates any rights whatsoever for private parties. The memorandum directs licensing boards to follow certain procedures when they have raised an issue *sua sponte*. The memorandum states that:

The Commission made clear that in so requesting, it was not altering in any way the provisions of the Commission's rules

¹ We find *Morton v. Ruiz* at 232, as cited by applicant, to be entirely inapposite. It holds that a legislative rule promulgated by an agency must be published in the Federal Register in order to comply with procedural requirements of the Administrative Procedure Act.

Chrysler v. Brown, 1979, 441 U.S. 281, 310-11 is somewhat more relevant. That case deals with the ability of an agency to use its housekeeping authority (5 U.S.C. §301) to enact regulations that are contrary to a criminal statute. It concludes that agencies lack such authority absent express statutory authorization. In that setting, the court ruled that 5 U.S.C. §301 authorized only "procedural rules" which cannot abridge protections of confidentiality included in the criminal code. However, we do not have a similar problem in this proceeding and do not find the court's interpretation of "procedure" in this very specialized context to be helpful to us in this proceeding.

We note that no party has suggested that *Chrysler* invalidates the Commission's rules governing the release of confidential information in the public interest, presumably because the Commission's regulations on the release of confidential information in the public interest are grounded in the Atomic Energy Act and are valid.

regarding the raising and consideration of issues *sua sponte*. Accordingly, the Boards shall continue to make the initial determination of whether a Board question is an exercise of *sua sponte* authority

We think it clear that the Commission intended that Boards would have the discretion to determine whether to treat an issue as *sua sponte*. It did not anticipate that this very issue would become a source of complication and delay in Commission proceedings. Since all of our decisions on this issue have been delivered to the commissioners, and read by the Appeal Board as well, there is an adequate opportunity for higher authorities to express dissatisfaction with our reasoning. But we do not think the parties have any further right to pursue this matter.

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is this 31st day of March, 1982,

ORDERED

Westinghouse Electric Corporations's March 9, 1982, Motion for Reconsideration of our February 26, 1982, order is denied.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION

Harold R. Denton, Director

In the Matter of

**PETITION REQUESTING
"CLOSEDOWN (OF) ALL
SUSPECT REACTORS" PENDING
RESOLUTION OF ALL
PRESSURIZED-THERMAL-SHOCK
NON-CONSERVATISMS**

March 31, 1982

The Director of Nuclear Reactor Regulation denies a petition under 10 CFR 2.206 which requested that all reactors potentially subject to pressurized thermal shock be shut down until all areas of nonconservatism in the analysis of the pressurized thermal shock issue are resolved.

TECHNICAL ISSUES DISCUSSED:

The potential role of seismic loads, hydrodynamic loads and vibratory loads in analysis of pressurized thermal shock.

DIRECTOR'S DECISION UNDER 10 CFR 2.206

By letter dated October 16, 1981, Mr. Marvin I. Lewis petitioned that the U. S. Nuclear Regulatory Commission "close down all suspect reactors, BWRs and PWRs, until and unless all areas of non-conservatism are explored." Mr. Lewis stated that the areas of non-conservatism which must be explored are:

- "A. Seismic loads which may have been the prime mover for the transient in question;
- B. Hydrodynamic loads, both normal and abnormal to the operation of a transient;
- C. Vibratory loads, either associated with hydrodynamic and seismic loads or not;

D. Any other sources of nonconservatism mentioned or *not* mentioned on this page of your ACRS presentation." (This last item refers to Dr. T. Murley's September 11, 1981 presentation to the ACRS, in transcript thereof on page headed, "Potential Sources of Nonconservatism in Analysis.")

The staff has evaluated the issues raised in the subject petition. For the reasons set forth below, I find there is reasonable assurance that operation of BWRs and PWRs can continue pending resolution of the pressurized thermal shock issue without endangering the health and safety of the public. For this reason the petitioner's request for shutdown of "suspect reactors" is denied.

Background

In an earlier paper¹, the staff outlined the technical aspects of the issue of pressurized thermal shock (PTS) and provided the bases for the conclusion that no immediate licensing actions were required for operating reactors. In a later paper², the staff further examined the issues and concluded that no new information had come to light that would alter the staff's conclusion that no immediate licensing actions are required for operating reactors.

The above conclusions are partially based upon the fact that PTS events require a precursor event, such as a pipe break or control system failure, plus several additional coincident or subsequent failures that exacerbate pressure and temperature behavior during the event. Plant operating experience and supporting analyses show that, although certain types of precursor events such as control and instrumentation system failures do occur, the combined probability of the occurrence of both the precursor and exacerbating failures that would result in a significant PTS event is sufficiently low to allow continued plant operation in the interim period while the PTS issue is being resolved by ongoing NRC and industry programs. The acceptability of continued plant operation is further supported by fracture mechanics analytical results which show that if one assumes the existence of preexisting cracks and the occurrence of a severe yet realistic transient,* reactor vessel failure would be unlikely even in the most vulnerable plants within the next few years. The general rationale involving a precursor plus other events that make the transient more

¹ SECY-81-286 dated May 4, 1981 to the Commissioners from W. J. Dircks.

² SECY-81-286A dated September 8, 1981 to the Commissioners from W. J. Dircks.

* The example used in the analyses was the transient which occurred at Rancho Seco on March 20, 1978.

serious or more difficult to recover from is important and relevant to several of the issues raised in the subject letter. The occurrence probability of many exacerbating failures or events was considered in reaching our conclusions, including the occurrence probability of the exacerbating events cited in the subject letter. Mr. Lewis' points are discussed below in the same order as quoted.

- A. A PTS event involves superposition of thermal stress loads on pressure loads, or the sequential application of thermal stress loads followed by pressure loads from repressurization. Thermal stress loads do not become significant until several minutes after a reactor shutdown. Therefore a seismic event would have to be severe enough to cause reactor shutdown before it could contribute to a PTS event, and then it would only be the random cause of shutdown (precursor), requiring subsequent exacerbating failures to occur before a significant PTS event could develop. One might postulate that these exacerbating failures could conceivably be caused by the seismic event itself or by a severe aftershock, but the primary coolant system is seismic Class I which means that it is specifically designed to resist failure from a seismic event. The main steam lines are seismic Class I up to and including the main steam isolation valves. Failure in the non-seismic portions of the steam system can be isolated by closing the isolation valve which happens automatically for large breaks. Thus the plant design will prevent seismically-caused exacerbating failures and we view them as very unlikely to occur.

There is some small possibility that a seismic event may cause multiple control system failures and contribute to operator confusion and error. The reactor control system as distinguished from the reactor protection system is not designed to standards equivalent to seismic Class I. The possibility of contributing failures, however, is being addressed in the Task Action Plans of Unresolved Safety Issues A-46 and A-47, "Seismic Qualification of Equipment in Operating Plants," and "Safety Implications of Control Systems," respectively, and results will be incorporated into PTS regulatory positions as appropriate.

The critical region for PTS is the vessel beltline. The neutron radiation is greatest there and some of the welds exposed to the neutron radiation have been found to be sensitive in terms of the loss of ductility or toughness (i.e., embrittlement). The primary stresses at the beltline from internal pressure and from

thermal shock during a PTS event will be very much greater than those that would accrue from an SSE* event. Therefore, the latter may be neglected. Because the vessel has a very low natural vibration frequency there will be no significant stresses for seismic-induced resonance. The SSE-induced stresses will be within the uncertainty generally ascribed to the principal PTS stresses. It is reasonable to conclude that seismic events will not contribute significantly to the non-conservatism of PTS analyses.

- B. Discussion of hydrodynamic loads as possible sources of non-conservatism in PTS calculations must begin with a qualifying statement. The nuclear industry and the NRC have established a working definition of hydrodynamic loads for purposes of analysis. Strict adherence to that definition would lead to the conclusion that hydrodynamic loads can be discounted in PTS events. The basis for such a conclusion is that this category of loads are of concern only in BWR plants. For example, when coolant is blown into the suppression pool in a Boiling Water Reactor (BWR) as a result of a plant malfunction severe shaking is induced in the supports and is transmitted to the vessel. Strict adherence to the working definition allows the assertion that there will be no hydrodynamic loads on a PWR vessel. Since PTS is of relatively little concern in BWRs it follows that hydrodynamic loads play no role in PTS.

For the sake of completeness, there are some hydraulic sources of loads in PWR plants which should be mentioned although technically they are non *hydrodynamic*. One source of hydraulic loading is the phenomenon of water hammer. The affected PWR systems, however, would be confined to other than the primary loop. Since water hammer would not occur in a PWR primary loop there would be no significant load on the vessel, thus no influence on a PTS transient. A second class of PWR hydraulic loads would occur as a result of a major cold-leg LOCA and the assymmetric blowdown forces. The loads, although significant, would be essentially confined to the supports, not the vessel itself. More importantly, the magnitude of the load on the supports would be proportional to the size of the break but a large LOCA would discharge so much coolant that the pressure (or repressurization) would be kept to a low value

*SSE: Safe Shutdown, Earthquake; a design-basis accident.

and, absent the pressure, there would be no PTS event at all. Finally, PWRs may be subjected to pressure spikes during a number of transients. In all cases, the resulting hydraulic loadings are reckoned with by including them in the piping system design both by analysis and pre-operational testing. Such transient-induced hydraulic loads will be too low in magnitude at the vessel beltline to be a factor in PTS analyses.

It is reasonable to conclude that hydrodynamic or hydraulic loads will be insignificant with respect to PTS events.

- C. The location of pumps and valves or other sources of mechanical vibration in the system is such that there is negligible probability of significant vibratory loads at the critical time and location as described in item B above. Vibratory loads can be significant with respect to the fatigue life of piping but the duration of a PTS event is too brief for them to influence the outcome. Also, the magnitude of vibratory loads *at the vessel beltline* is so low as to be well within the uncertainty allowances used in calculating pressure and thermal stresses. Thus there is no reason to expect that vibratory loads could contribute significantly to the severity of a PTS event.
- D. The NRC staff believes it has duly considered the contribution of all known sources of non-conservatism in reaching our conclusions regarding PTS. We do not believe there are other significant sources of non-conservatism that have not been considered.

Based on the foregoing discussion, I have concluded that acceptable bases exist for continued operation of all PWRs and BWRs pending resolution of the PTS issue. I believe that our previous conclusions and bases for those conclusions are valid in that regard, and that there is reasonable assurance that the health and safety of the public is protected. Therefore, I have determined that the petitioner's request for shutdown of all "suspect" BWRs and PWRs is denied.

A copy of this decision will be placed in the Commission's Public Document Room located at 1717 H Street, N.W., Washington, D. C. 20555. A copy of this decision will be filed with the Office of the Secretary

of the Commission for its review in accordance with 10 CFR 2.206(c) of the Commission's regulations.

**FOR THE NUCLEAR
REGULATORY COMMISSION**

**Harold R. Denton, Director
Office of Nuclear Reactor Regulation**

**Dated at Bethesda, Maryland
this 31st day of March 1982.**

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Nunzio J. Palladino, Chairman
Victor Gillinsky
John F. Ahearne
Thomas M. Roberts

In the Matter of

Docket Nos. 50-275 OL
50-323 OL
(SECURITY)

**PACIFIC GAS AND ELECTRIC
COMPANY**
(Diablo Canyon Nuclear
Power Plant, Units 1 and 2)

April 22, 1982

The Commission denies two petitions for review of an Appeal Board decision (ALAB-653 (Restricted), 14 NRC 629 (1981)), in this operating license proceeding concerning the physical security plan for this facility. The Commission also decides it will not, contrary to earlier indication (CLI-81-22, 14 NRC 598, 600 (1981)), undertake review of the Appeal Board's interpretation of the word "several" as used in 10 CFR 73.1(a)(1)(i) describing a design basis threat; the Commission states its belief that the design basis threat should nonetheless be reevaluated, and announces that it will handle such reevaluation generically.

ORDER

On September 9, 1981 the Atomic Safety and Licensing Appeal Board held in ALAB-653 (RESTRICTED) that the physical security plan for the Diablo Canyon Nuclear Power Plant conformed to the applicable provisions of the Atomic Energy Act of 1954, as amended, and the Commission's regulations. Governor Edmund Brown and San Luis Obispo Mothers For Peace filed petitions for review with the Commission, setting forth numerous allegations of Appeal Board error. The Commission, upon examining the pleadings and the Appeal Board opinion, has denied the petitions for review.

However, one issue, the Appeal Board's interpretation of the word "several" as used in the design basis threat of 10 CFR 73.1(a)(1)(i), merits further comment. In its earlier decision reviewing the Appeal Board's decision authorizing issuance of a fuel loading and low power testing license for Diablo Canyon, the Commission stated that it "does not necessarily agree with the Board's conclusion regarding the definition of the word 'several' found in 10 CFR 73.1(a)(1)(i). The Commission will provide guidance on this matter at a later date." *In the Matter of Pacific Gas and Electric Company* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-81-22, 14 NRC 598, 600 (1981). After further examining this matter, the Commission has decided that this issue does not warrant Commission review within the context of this proceeding.

Nonetheless, in its Statement of Considerations accompanying the adoption of Section 73.1(a)(1), the Commission stated that "the kind and degree of threat and the vulnerabilities to such threats will continue to be reviewed by the Commission. Should such reviews show changes that would dictate different levels of protection the Commission would consider changes to meet the changed conditions." 42 *Fed. Reg.* 10836 (February 24, 1977). Five years have elapsed since the adoption of Section 73.1(a)(1)(i), and the Commission believes that the design basis threat should be reevaluated. The Commission will handle this reevaluation generically.

The separate views of Commissioner Gilinsky and additional views of Commissioners Ahearne and Roberts are attached.

It is so ORDERED.

For the Commission

SAMUEL J. CHILK
Secretary of the Commission

Dated at Washington, D.C.
this 22nd day of April, 1982.

SEPARATE VIEWS OF COMMISSIONER GILINSKY

I would affirm the Appeal Board's conclusion that the Diablo Canyon physical security plan is adequate. However, I would reverse the Appeal Board's interpretation of the term "several". When the Commission, on which I sat, adopted the rule requiring facilities to be capable of defending against "several" armed attackers, it did not intend to limit the threat to

some fixed number, as the staff and Board apparently think, but instead intended the word to mean what it plainly means: "more than two but fewer than many".

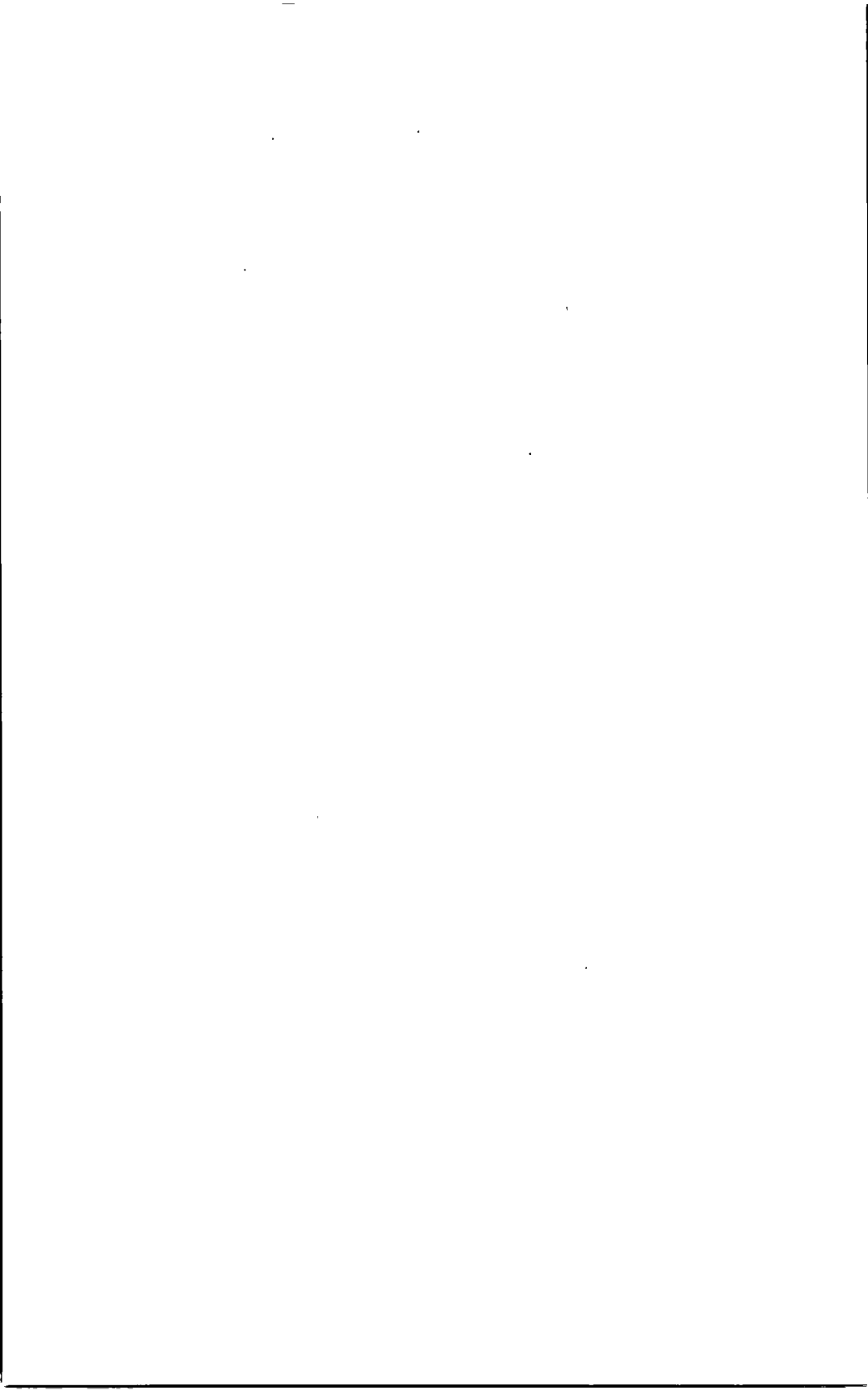
The Commission deliberately chose not to require that a system be capable of defending only against a specific number of attackers precisely because the Commission intended that the security system be relatively insensitive to minor changes in the number of attackers. This is a terribly important point which has been entirely overlooked in this proceeding, and of which the Appeal Board seems unaware. This extra margin of security would be lost if the Commission were to endorse the Board's interpretation. Fortunately, it appears that a majority of the Commission does not support such an interpretation.

I would ask the staff to explain its reasons for selecting the number of armed responders required at licensed sites and its present views on the number of armed responders which should be required.

ADDITIONAL VIEWS OF COMMISSIONERS AHEARNE AND ROBERTS

Commissioner Gilinsky's opinion may be read as indicating the Commission denied review because it was convinced beyond doubt that (1) the Appeal Board correctly characterized the Commission's intent in using the term "several" and (2) its interpretation is the correct approach.

A more accurate statement of our basis for declining review is that the Appeal Board decision is reasonable, there is no real question about adequacy of the physical security plan in this case, and the questions we believe should be addressed are more appropriately discussed in a generic context. The Commission has agreed to do so.



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Alan S. Rosenthal, Chairman
Dr. John H. Buck
Christine N. Kohl

In the Matter of

Docket Nos. 50-498 OL
50-499 OL

HOUSTON LIGHTING & POWER
COMPANY, et al.
(South Texas Project, Units 1
and 2)

April 21, 1982

The Appeal Board issues a memorandum explicating the reasons for its unpublished order (April 15, 1982) requiring that another member of the Licensing Board panel be designated to replace a technical member of the Licensing Board in this operating license proceeding.

RULES OF PRACTICE: DISQUALIFICATION

A party leveling a charge as serious as that of bias against a licensing board or its members has a manifest obligation to be most particular in establishing the foundation for the charge. *Duquesne Light Co.* (Beaver Valley Power Station, Units 1 and 2), ALAB-172, 7 AEC 42, 43 (1974).

RULES OF PRACTICE: MOTIONS (DISQUALIFICATION)

An express and ironclad requirement of 10 CFR 2.704(c) is that recusal motions "be supported by affidavits setting forth the alleged grounds for disqualification." *Beaver Valley, supra*, 7 AEC at 43 fn. 2; *Dairyland Power Cooperative* (LaCrosse Boiling Water Reactor), ALAB-497, 8 NRC 312, 313-14 (1978). The movant must refrain from sweeping and unsubstantiated assertions.

RULES OF PRACTICE: DISQUALIFICATION

An administrative trier of fact is subject to disqualification for the appearance of bias or prejudgment of the factual issues as well as for actual bias or prejudgment. *Consumers Power Co.* (Midland Plant, Units 1 and 2), ALAB-101, 6 AEC 60, 64-65 (1973).

RULES OF PRACTICE: DISQUALIFICATION

A motion seeking the recusal of a member of the Commission or of an appeal board from further participation in an adjudicatory proceeding is to be determined by that individual rather than by the full Commission or board. *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-80-6, 11 NRC 411 (1980) (Commissioner); *id.*, CLI-80-9, 11 NRC 436, 437 (1980) (Appeal Board member).

APPEARANCES

Mr. Lanny Sinkin, Austin, Texas, for the intervenor, Citizens Concerned About Nuclear Power.

Messrs. Jack R. Newman, Maurice Axelrad and Alvin H. Gutterman, Washington, D.C., and **Finis E. Cowan and Thomas B. Hudson, Jr.**, Houston, Texas, for the applicants, Houston Lighting & Power Company, *et al.*

Mr. Jay M. Gutierrez for the Nuclear Regulatory Commission staff.

MEMORANDUM

On March 9, 1982, intervenor Citizens Concerned About Nuclear Power (CCANP) filed a motion under 10 CFR 2.704(c) calling upon Administrative Judge Ernest E. Hill to recuse himself from further service on the Licensing Board for this operating license proceeding now in progress. Subsequently, as required by Section 2.704(c), two affidavits were submitted in support of the motion. Broadly speaking, the motion and affidavits asserted that, during the course of the proceeding to date, on several occasions and in different ways Judge Hill had manifested a lack of impartiality — indeed, an open hostility toward CCANP, a self-avowed “anti-nuclear organization”

Both the applicants and the NRC staff filed oppositions to the motion. Thereafter, on April 13, the other two members of the Licensing Board

issued an unpublished memorandum and order. Observing that Judge Hill had declined to recuse himself for reasons set forth in an accompanying separate statement, the quorum memorandum and order (at p. 4) addressed the question "whether the accusations [in the motion] have merit and, if so, are legally disqualifying". The two members of the Board answered this question in the negative and, accordingly, denied the motion.

As mandated by 10 CFR 2.704(c), the Licensing Board simultaneously referred the motion to us. Because another hearing session was to begin one week later, an early disposition of the matter was imperative. We therefore embarked immediately upon an examination of the documents before us. That examination produced the following result, announced in a brief unpublished order issued on April 15:

Essentially for the reasons stated by the Licensing Board quorum, we do not believe that of themselves the motion and supporting affidavits provide sufficient cause for Judge Hill's recusal or disqualification. At the same time, however, several of the comments contained in his separate statement give rise to a serious doubt respecting Judge Hill's present ability to judge CCANP and its assertions in this proceeding dispassionately. The appearance of total objectivity being as important as the reality, we are thus compelled to the conclusion that another member of the Licensing Board Panel should be now designated to replace Judge Hill [footnote omitted].

The order indicated that a full opinion would issue at a later date.¹

A. No useful purpose would be served by detailing the basis of our agreement with the Licensing Board quorum that the CCANP motion and supporting affidavits were insufficient to justify Judge Hill's recusal or disqualification.² On that score, we simply emphasize that, apart from all other considerations, the recitals in CCANP's papers relating to purported on-the-record manifestations of bias on Judge Hill's part are not accompanied by transcript references.³ In addition, many of the broadly stated claims suffered from a lack of specificity.

Long ago, we were confronted with a disqualification motion that likewise "contained very little more than broad and vague assertions" of

¹ Despite our efforts to avoid any delay in the hearing as a result of our decision, we understand that a new member of the Licensing Board has not yet been designated and that the hearing has been postponed indefinitely.

² Whether Judge Hill's colleagues should themselves have ruled upon the recusal motion is, however, another matter. See pp. 683-685 *infra*.

³ CCANP's papers also contained numerous allusions to Judge Hill's demeanor, as well as to certain alleged "off the record manifestations" of bias. While those allusions may not have been susceptible of supporting record references, in no event could they carry the same weight as claims subject to verification.

bias, "which assertions were not accompanied by record references". Although that motion was voluntarily withdrawn after its referral to us by the Licensing Board, we nonetheless felt constrained to call attention to its deficiencies. In this regard, we stressed that a "party leveling a charge as serious as that of bias against a licensing board or its members has a manifest obligation to be most particular in establishing the foundation for the charge * * *". *Duquesne Light Co.* (Beaver Valley Power Station, Units 1 and 2), ALAB-172, 7 AEC 42, 43 (1974).

That admonition bears repetition. NRC adjudicators are entitled to be free of irresponsible attacks upon their probity and objectivity. The express and ironclad requirement of Section 2.704(c) that recusal motions "be supported by affidavits setting forth the alleged grounds for disqualification" serves that end.⁴ But so too does an insistence that the movant refrain from sweeping and unsubstantiated assertions of the stripe that freight both the motion and the affidavits here.⁵

B. We now turn to the underpinnings of our conclusion that Judge Hill's separate statement gave "rise to a serious doubt respecting [his] present ability to judge CCANP and its assertions in this proceeding dispassionately". See p. 679, *supra*. As scarcely requires extended discussion, if a basis for such a doubt existed, his replacement as a member of this Licensing Board was obligatory without regard to his disclaimer of bias against CCANP.⁶ We need not go beyond what was said on the point in *Consumers Power Co.* (Midland Plant, Units 1 and 2), ALAB-101, 6 AEC 60, 64-65 (1973) (footnote omitted):

The federal courts have made it equally clear that the appearance of either bias or the prejudgment of factual — as opposed to legal — issues in controversy will disqualify an adjudicator from participating in a proceeding. Thus, in two separate cases, the Chairman of the Federal Trade Commission was disqualified from participating in proceedings where he had previously made speeches which took a position on factual matters directly in controversy. *Cinderella Career and Finishing Schools, Inc. v. Federal Trade Commission*, 425 F.2d 583 (D.C. Cir. 1970); *Texaco, Inc. v. Federal Trade Commission*, [336 F.2d 754 (D.C. Cir. 1964), vacated and remanded on other grounds, 381 U.S. 739

⁴ *Beaver Valley, supra*, 7 AEC at 43 fn. 2; *Dairyland Power Cooperative* (LaCrosse Boiling Water Reactor), ALAB-497, 8 NRC 312, 313-14 (1978).

⁵ See, for example, the bald representation at p. 2 of the March 23, 1982 affidavit of CCANP's representative, Lanny Alan Sinkin, that Judge Hill had "repeatedly demonstrated an antagonistic and hostile attitude toward CCANP'S participation in this proceeding".

⁶ It is of no consequence that the basis for our doubts about Judge Hill's objectivity is found not in CCANP's motion and affidavits, but rather in the statement prompted by such motion. Once such evidence of bias manifests itself, we can scarcely deny its existence.

(1965)]. In both cases, the court expounded its test for disqualification as being whether

a disinterested observer may conclude that [the agency] has in some measure adjudged the facts as well as the law of a particular case in advance of hearing it.

In emphasizing that the appearance of bias or prejudice is a valid basis for disqualification as is actual bias or prejudice, a court noted: " * * * an administrative hearing * * * must be attended, not only with every element of fairness but with the very appearance of complete fairness. Only thus can the tribunal conducting a quasi-adjudicatory proceeding meet the basic requirement of due process." *Amos Treat & Co. v. S.E.C.*, 306 F.2d 260, 267 (D.C. Cir. 1962).

Under this rule, actual bias or prejudice need not be shown. Indeed, the rule "may sometimes bar trial by [those] who have no actual bias and who would do their very best to weigh the scales of justice equally between contending parties." *In re Murchison* [349 U.S. 133, 136 (1955)]. As one judge cogently remarked,

We must presume that a fair hearing was denied if a disinterested observer would have reason to believe that the Commissioner had "in some measure adjudged the facts * * * of a particular case in advance of hearing it" [*Texaco, supra*, 336 F.2d at 764 (Washington, J., concurring) (footnotes omitted)].

In sum, therefore, an administrative trier of fact is subject to disqualification * * * if he has a "personal bias" against a participant; * * * or if he has engaged in conduct which gives the appearance of personal bias or prejudice of factual issues.

We appraised the separate statement with these settled principles in mind. In other words, the question at hand was whether a disinterested observer could have reasonably inferred from Judge Hill's statement that he now has a personal animus against this intervenor which could affect his ability to pass judgment objectively upon its cause.

At the outset of the statement, Judge Hill laid bare the depth of his resentment respecting the motion and its content: he considered it to be a "personal and unwarranted attack on [his] professional and moral integrity".⁷ Whether or not that characterization was justified, it might well not have occasioned difficulty had Judge Hill thereafter confined himself to a dispassionate response to the claims on which the motion rested. But he did not do so. Rather, he launched a series of direct attacks

⁷ See p. 686, *infra*. (Judge Hill's statement is attached as an appendix to this opinion.)

of his own upon "the representatives for CCANP",⁸ cast for the most part in extremely pejorative terms.

More specifically, those representatives were accused of: "actively subvert[ing] the stated objectives of this expedited proceeding by being unduly contentious with matters having little, if any, bearing on the admitted contentions"; providing "a constant flow of additional and largely unsupported allegations against various principals in [the] case"; conducting "needlessly long and unproductive cross examination of various witnesses"; and "on several occasions" having "been unwilling to heed the advice or admonishment of this Board to cease such delaying and obstructing actions".⁹ In addition to these "delaying and harassing actions", according to the statement, the CCANP representatives had "blatantly used this proceeding as a forum to present CCANP's political views on subjects not at issue * * *".¹⁰ And, finally, the statement recorded Judge Hill's view that the charge of bias had been placed against him because of his several efforts to have the Board Chairman "limit the subverting actions of the representatives of CCANP"; as he saw it, "those representatives have chosen to misinterpret my objections to this misuse of the proceeding as a bias against CCANP".¹¹

These statements speak for themselves. It suffices to say that they reflect a lack of sensitivity for the role that a judge must necessarily play in any adjudication. A judge must put aside his personal feelings and exercise restraint in responding to charges of bias, even where they may be particularly inflammatory.¹² The use of intemperate language, particularly in a written (rather than oral) statement like Judge Hill's, is at odds with the notion of judicial restraint and fairness, and the most sincere disclaimer of bias cannot salve the damage already inflicted.

Moreover, apart from their import and tone, Judge Hill's observations were totally gratuitous. None of them had the slightest discernible relevance to the only matter before Judge Hill for consideration: whether, as claimed by CCANP, he had displayed a personal animosity against that organization, its representatives or the cause it espoused. It is also noteworthy that, aside from a single reference to the trial transcript,¹³ the statement did not document any of the indictments of CCANP, its actions or

⁸ P. 686, *infra*.

⁹ *Ibid*.

¹⁰ *Ibid*.

¹¹ P. 687, *infra*.

¹² This is not to suggest that CCANP's motion and affidavits were such as to provoke a response in kind.

¹³ Tr. 9981-83 (January 22, 1982), where the Board Chairman criticized certain aspects of the cross-examination conducted by then CCANP counsel. From all that appears there, this was the first occasion on which the Board admonished a CCANP representative.

its motives. Thus, even if they had some bearing on the issue raised by the CCANP motion, it would not be readily possible to substantiate those indictments.¹⁴

The disqualification of a Licensing Board member — particularly on grounds of the appearance of bias against one of the litigants — is not a step lightly to be taken. In the totality of the foregoing circumstances, however, we were left with no other choice. By electing to address the CCANP motion in the manner in which he did — rather than simply confronting its assertions on their merits — Judge Hill affirmatively created the impression that he harbors a deep-seated personal hostility towards CCANP and its representatives, which could be expected to affect materially his future determinations on matters of concern to that intervenor. Once again, whether that impression accords with reality is quite beside the point. The fact that there is a legitimate basis for it is enough.

C. There remains a procedural question which was raised and determined by the Licensing Board quorum. Although not crucial to the result that we reach, the question may recur and is of sufficient general importance to warrant our attention here.

As the Board quorum acknowledged (at p. 3), the Commission has squarely held that a motion seeking the recusal of a member of the Commission or of an appeal board from further participation in an adjudicatory proceeding is to be determined by that individual rather than by the full Commission or board. *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-80-6, 11 NRC 411 (1980) (Commissioner); *id.*, CLI-80-9, 11 NRC 436, 437 (1980) (Appeal Board member).¹⁵ Nonetheless, as we have seen, the Board quorum elected not to follow the guidance of those precedents in this instance. Rather, once Judge Hill determined not to recuse himself, the Board quorum then passed upon the motion itself.

As we read its opinion (at pp. 3-4), three considerations prompted that course. First, the Board quorum read 10 CFR 2.704(c) as obliging it to decide the motion once Judge Hill had declined to step aside voluntarily. Second, the quorum (without further elaboration) opined that the Commission's rulings in *Diablo Canyon* may have been "a reflection of the particular circumstances of the single proceeding which generated those decisions". Third, the quorum noted our at least implicit prior endorsement

¹⁴ In this connection, whether in recognition of its immateriality or for some other reason, the Board quorum did not mention, let alone endorse, Judge Hill's commentary.

¹⁵ In the latter case, following the issuance by the Appeal Board member of a statement explaining the reasons why he declined to recuse himself, the Commission reviewed the statement and determined that "a case has not been established for disqualification". CLI-80-11, 11 NRC 511, 512 (1980).

of this procedure in *Nuclear Engineering Co.* (Sheffield, Illinois, Low-Level Radioactive Waste Disposal Site), ALAB-494, 8 NRC 299, 301 (1978).

We acknowledge that, as *Sheffield* illustrates, prior to *Diablo Canyon* licensing boards generally followed the practice adopted below, without our objection. But we do not agree with the Board quorum that either the *Diablo Canyon* rulings may have been dictated by special circumstances obtaining in that case,¹⁶ or the terms of Section 2.704(c) preclude the application of those rulings to motions seeking the recusal of a licensing board member. Further, there appears to us to be substantial practical cause for not placing two members of a licensing board in the awkward position of having to decide whether the third member should be involuntarily removed.

1. The relevant provisions of Section 2.704(c) are these:

If a party deems the presiding officer or a designated member of an atomic safety and licensing board to be disqualified, he may move that the presiding officer or the board member disqualify himself. * * * If the presiding officer does not grant the motion or the board member does not disqualify himself, the motion shall be referred to * * * the Atomic Safety and Licensing Appeal Board * * *.

Because the Rules of Practice employ generally the term "presiding officer" to refer to the entire Licensing Board (in circumstances where a board rather than a single administrative law judge is conducting the proceeding), the Board quorum reasoned that it was obliged to determine the motion once Judge Hill decided not recuse himself. See 10 CFR 2.721.

Leaving aside that the Commission apparently does not so construe Section 2.704(c) (see fn. 16, *supra*), we think that reasoning to be flawed. Most importantly, it overlooks the use of "or" rather than "and" in the second sentence quoted; *i.e.*, the contemplation is that there may be either a denial of the motion by the "presiding officer" *or* a refusal of the board member to disqualify himself — but not both. And the first sentence makes clear the foundation for the disjunctive reference to action by presiding officers and individual board members. It specifically authorizes the filing of a motion directed either to the presiding officer or, in the case of a licensing board, to a member thereof. Obviously, the initial determination of a motion to disqualify an *entire* board (*i.e.*, presiding officer) must

¹⁶ On that score, we find nothing in the Commission's opinions to suggest that it perceived the existence of such circumstances. To the contrary, the Commission referred the motion to disqualify the Appeal Board member to him for initial consideration (subject to later Commission review) "[c]onsistent with [the] principle" that the Commission thought was established by Section 2.704(c). CLI-80-9, *supra*, 11 NRC at 437.

be made by the board collegially. This is not so, however, in the instance of a motion that seeks the recusal of a particular board member.¹⁷

2. In *Diablo Canyon*, CLI-80-6, *supra*, the Commission noted that its determination that "disqualification decisions should reside exclusively with the challenged Commissioner" without further peer review was consistent with "the generally accepted practice of the federal courts and administrative agencies". 11 NRC at 411-12.¹⁸ This is scarcely surprising. For one thing, the truth or falsity of the assertions underlying the recusal motion often will be within the special knowledge of the individual to whom those assertions relate.¹⁹ Beyond that, the effective discharge of the functions of any collegial body depends to a large extent upon the existence of harmonious working relationships among its members. It requires little imagination to forecast the likely consequences in that regard were a licensing board quorum to overrule the third member on such a highly sensitive matter as the latter's objectivity.²⁰ Needless to say, appellate review by a higher tribunal does not present a similar danger.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the Appeal Board

¹⁷ The legislative history of Section 2.704(c) does not conflict with the plain terms of the Section. See 40 *Fed. Reg.* 51995-96 (November 7, 1975).

¹⁸ See, e.g., in this connection, 28 U.S.C. 455; *Laird v. Tatum*, 409 U.S. 824 (1972) (Rehnquist, J.); *Jewel Ridge Coal Corp. v. Local 6167, United Mine Workers*, 325 U.S. 897 (1945) (Jackson, J.); 17 CFR 200.60 (SEC); 49 CFR 1000.736-5 (ICC); *Standard Oil of California*, 29 AdL2d 339 (FTC, 1971).

¹⁹ To be sure, that will not invariably be the case. In this instance, for example, one of the claims in Mr. Sinkin's March 23, 1982 affidavit (see fn. 5, *supra*) was that certain allegedly erroneous rulings of the Licensing Board had been brought about by Judge Hill's "domination" of the Board. In its opinion (at pp. 6-7), the Board quorum denied the accuracy of that claim. Even had the quorum left it to Judge Hill to pass on the motion, however, it would have remained free to file a separate statement of its own (as opposed to a ruling on the motion) on that matter, as well as any other matters raised by the motion, as to which it might possess greater information.

To the extent that a recusal motion may present issues of law, the involved board member is entitled, of course, to solicit the advice of his colleagues or of the legal counsel available to the Licensing Board Panel.

²⁰ Indeed, because of this precise consideration, a determination by a board quorum *not* to disqualify the third member might be viewed with suspicion, even if unjustifiably so in the particular circumstances at hand.

APPENDIX

Separate Statement of Judge Ernest E. Hill, appended to the April 13, 1982 memorandum and order of the Licensing Board quorum.

I fully subscribe to the reasons set forth in the opinion of Judge Lamb and Judge Bechhoefer for denying the CCANP motion. I wish to provide further comment on what I consider to be a personal and unwarranted attack on my professional and moral integrity.

In September 1978, the Nuclear Regulatory Commission established this Licensing Board to rule on intervention petitions. The same Board was later authorized to conduct hearings on the application by Houston Lighting and Power Co. *et al.* to operate the South Texas Project. 44 Fed. Reg. 21090 (April 9, 1979). On September 22, 1980, the Commission further directed this Board to conduct expedited hearings on issues arising from the Show Cause Order of April 30, 1980. CLI-80-32, 12 NRC 281. The then-constituted Board, which earlier had adopted two contentions of CEU and CCANP relating to potential construction and QA deficiencies, then formulated six additional issues, based on CLI-80-32, to be considered in this expedited hearing. The sum total of these contentions and issues constituted a rather narrow spectrum of issues to be heard in an expedited manner, leaving the remainder of the OL proceeding to be heard at a later date.

On March 11, 1981 the hearing board was reconstituted in order to replace Dr. Emmeth A. Luebke with Ernest E. Hill. 46 Fed. Reg. 17319 (March 18, 1981). Previously adopted contentions and issues remained unchanged and the case went to evidentiary hearing on May 12, 1982.

From the outset, the representatives for CCANP have in many instances actively subverted the stated objectives of this expedited proceeding by being unduly contentious with matters having little, if any, bearing on the admitted contentions. In addition to the contentions admitted for adjudication by this Board, they have provided a constant flow of additional and largely unsupported allegations against various principals in this case. In many instances, the CCANP representatives have conducted needlessly long and unproductive cross examination of various witnesses and on several occasions have been unwilling to heed the advice or admonishment of this Board to cease such delaying and obstructing actions. (See, *e.g.*, Tr. 9981-9983 (January 22, 1982).)

In addition to these delaying and harassing actions, the representatives for CCANP have blatantly used this proceeding as a forum to present CCANP's political views on subjects not at issue, at least in this expedited phase of the case. In particular, they have attempted to inject the internal political issues of the cities of Austin and San Antonio into this proceeding.

In my opinion, the representations of this Board member to the Chairman on several occasions to limit the subverting actions of the representatives of CCANP have lead to this charge of bias. Indeed, those representatives have chosen to misinterpret my objections to this misuse of the proceeding as a bias against CCANP.

The other claim of bias made against me, based on my career field and place of employment, is most unfortunate. I have spent over twenty-five years in the field of nuclear safety. I feel that I have made at least some modest contribution to the safe design, construction, and operation of nuclear systems. I particularly resent the implication that the choice and pursuit of this career field in some way raises doubts about my professional moral integrity.

The Atomic Safety and Licensing Board Panel (ASLBP) has, since its inception, relied heavily on the services of nuclear scientists and engineers chosen from the Atomic Energy Commission and later the Department of Energy National Laboratories. There have been more than ten nuclear scientists or engineers chosen from the National Laboratories to serve on the ASLBP. Of these, five have been selected from the Los Alamos National Laboratory or the Lawrence Livermore National Laboratory, both operated by the University of California. I am proud to be one of those selected from these laboratories and feel strongly that such a background does not, in any way, constitute bias against any party to this case.

The charge that the Lawrence Livermore National Laboratory is "part of the nuclear industry" is one that would be objected to by the Department of Energy, the University of California, the Lawrence Livermore National Laboratory and, indeed, by the "nuclear industry" itself.

CCANP and its representatives can be assured of three conclusions from this unfortunate affair: First, I have not in the past nor have I now any bias against CCANP or its representatives; second, I will not disqualify myself from this case; and third, I will continue my efforts to effectively complete this proceeding in an orderly and timely manner, as directed by the Commission.

Based on the legal considerations discussed in the Board's opinion, together with the additional comments provided in this separate statement, I decline to grant CCANP's request that I recuse myself from further participation in this proceeding.

Ernest E. Hill, Member
ADMINISTRATIVE JUDGE

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Stephen F. Ellperin, Chairman
Dr. W. Reed Johnson
Dr. Reginald L. Gotchy

In the Matter of

Docket Nos. 50-361 OL
50-362 OL

SOUTHERN CALIFORNIA EDISON
COMPANY, et al.
(San Onofre Nuclear Generating
Station, Units 2 and 3)

April 26, 1982

The Appeal Board denies intervenors' motion for a stay pending appeal of the Licensing Board's partial initial decision (LBP-82-3, 15 NRC 61 (1982)) which authorized the issuance of a low-power operating license for Unit 2 of this facility.

RULES OF PRACTICE: STAY PENDING APPEAL

The determination whether to grant a stay pending appeal is governed by 10 CFR 2.788(e) which codifies the criteria established in *Virginia Petroleum Jobbers Ass'n v. Federal Power Commission*, 259 F.2d 921, 925 (D.C. Cir. 1958). See also *Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-437, 6 NRC 630 (1977); *Northern Indiana Public Service Co.* (Bailly Generating Station, Nuclear 1), ALAB-192, 7 AEC 420 (1974).

COMMISSION PROCEEDINGS: RES JUDICATA/COLLATERAL ESTOPPEL

The doctrines of res judicata and collateral estoppel are generally applicable to NRC proceedings. *Alabama Power Co.* (Joseph M. Farley

Nuclear Plant, Units 1 and 2), ALAB-182, 7 AEC 210, 212-16, *remanded on other grounds*, CLI-74-12, 7 AEC 203 (1974); *Houston Lighting & Power Co.* (South Texas Project Units 1 and 2), LBP-79-27, 10 NRC 563, 566 (1979), *aff'd* ALAB-575, 11 NRC 14 (1980). See also *Toledo Edison Co.* (Davis-Besse Nuclear Power Station, Units 1, 2 and 3), ALAB-378, 5 NRC 557, 563 (1977).

COMMISSION PROCEEDINGS: RES JUDICATA/COLLATERAL ESTOPPEL

The judicial doctrines of *res judicata*, collateral estoppel and privity provide the appropriate bases for determining when concededly different persons or groups should be treated as already having had their day in court. The "privity" concept requires legal accountability between groups or virtual representation of one group by the other. See generally *Southwest Airlines Co., v. Texas International Airlines*, 546 F.2d 84, 95 (5th Cir.), *cert. denied*, 434 U.S. 832 (1977). See also *United States v. Trochee-Carson*, 649 F.2d 1286, 1303 (9th Cir. 1981); *United States v. ITT Rayonier, Inc.*, 627 F.2d 996, 1003 (9th Cir. 1980); *Pollard v. Cockrell*, 578 F.2d 1002, 1008-09 (5th Cir. 1978); *Expert Electric, Inc. v. Levine*, 554 F.2d 1227, 1233 (2d Cir.), *cert. denied*, 434 U.S. 903 (1977).

OPERATING LICENSE HEARINGS: ISSUES FOR CONSIDERATION

The Commission may place limitations upon the issues that may be litigated at the operating license stage by either (1) entirely eliminating certain issues from operating license consideration on the ground that they are suited for examination only at the earlier construction permit stage, (see 47 *Fed. Reg.* 12940 (March 26, 1982)) or, short of that, (2) providing by rule that any issues which were or could have been raised by a party to the construction permit proceeding will not be entertained at the operating license stage except upon a showing of "changed circumstances" or "newly discovered evidence." Commission practice presently applies conventional *res judicata* and collateral estoppel principles in determining the litigability of such issues at the operating license stage.

RULES OF PRACTICE: ERROR IN EXCLUSION OF EVIDENCE

In general, error may not be predicated upon a ruling which excludes evidence unless a substantial right is affected, and the substance of the evidence is made known by way of an offer of proof or is otherwise

apparent. Fed. R. Evid. 103. See generally *United States v. Vitale*, 596 F.2d 688, 689 (5th Cir. 1979), cert. denied, 444 U.S. 868 (1980); *United States v. Callahan*, 551 F.2d 733, 738 (6th Cir. 1977); *Hochstadt v. Worcester Foundation for Experimental Biology*, 545 F.2d 222, 226 n.4 (1st Cir. 1976). See also 1 *Weinstein's Evidence* ¶ 103[3], at 103-27 (1981); 21 *Wright & Graham, Federal Practice & Procedure* §5040 (1977), at 209.

OPERATING LICENSE: SUSPENSION (REOPENED HEARING)

In deciding whether to allow continued operation of a plant during the pendency of a reopened hearing, the standard to be applied is whether the continued operation of the plant over the period required to complete the additional proceedings will be consistent with the requirement that there be reasonable assurance that the public health and safety not be endangered. See 10 CFR 2.104(c)(3); 10 CFR 50.57(a)(3). If not, the facility cannot be allowed to continue to operate. *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 2), ALAB-486, 8 NRC 9, 46 (1978).

APPEARANCES

Messrs. David R. Pigott, Edward B. Rogin, Samuel B. Casey and John A. Mendez, San Francisco, California, Charles R. Kocher and James A. Beoletto, Rosemead, California, for the applicants.

Mr. Richard J. Wharton, San Diego, California, for the Interveners, Carstens, *et al.*

Mr. Lawrence J. Chandler for the Nuclear Regulatory Commission staff.

DECISION

Interveners Carstens *et al.*, seek a stay pending their appeal of the Licensing Board's January 11, 1982 partial initial decision which authorized the issuance of a low-power operating license for the San Onofre Nuclear Generating Station, Unit 2 (San Onofre). See LBP-82-3, 15 NRC 61 (1982). The stay motion focuses on the ability of crucial power plant safety systems to withstand the most severe earthquake that might affect the plant during its operating lifetime, what NRC regulations term the

"safe shutdown earthquake." 10 CFR Part 100, Appendix A, §III(c); *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 & 2), ALAB-644, 13 NRC 903, 913 (1981).¹

Intervenors argue that the Licensing Board erroneously foreclosed them from presenting evidence that the Cristianitos fault, located about one-half mile from San Onofre was "capable" — *i.e.*, susceptible of generating earthquake activity, and hence posed a threat to the plant.² Intervenors also argue that the Licensing Board erred by treating as segmented the principal geologic feature in the proceeding (the Offshore Zone of Deformation, or OZD), with the asserted result that the Board underestimated the magnitude and peak ground acceleration (PGA) of the earthquake the plant must be designed to resist.³ Intervenors allude to a number of other claimed factual errors that they allege wrongly diminish the designed-against safe shutdown earthquake.

In passing upon intervenors' stay request we apply 10 CFR 2.788(e), which codifies the criteria long ago established by the Court of Appeals for the District of Columbia Circuit in *Virginia Petroleum Jobbers Ass'n v. Federal Power Commission*, 259 F.2d 921, 925 (1958). See also *Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-437, 6 NRC 630 (1977); *Northern Indiana Public Service Co.* (Bailly Generating Station, Nuclear 1), ALAB-192, 7 AEC 420 (1974). The rule calls upon us to consider:

- (1) Whether the moving party has made a strong showing that it is likely to prevail on the merits;
- (2) Whether the party will be irreparably injured unless a stay is granted;
- (3) Whether the granting of a stay would harm other parties; and
- (4) Where the public interest lies.

¹ Unit 1 was licensed to operate in 1967. Its seismic design is currently being upgraded, generally to that found acceptable by the Licensing Board here. See *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Unit 1), DD-81-19, 14 NRC 1041, 1043 (1981).

² 10 CFR Part 100, Appendix A, §III(g) defines a capable fault as a fault that has exhibited one or more of the following characteristics:

- (1) Movement at or near the ground surface at least once within the past 35,000 years or movement of a recurring nature within the past 500,000 years.
- (2) Macro-seismicity instrumentally determined with records of sufficient precision to demonstrate a direct relationship with the fault.
- (3) A structural relationship to a capable fault according to characteristics (1) or (2) of this paragraph such that movement on one could be reasonably expected to be accompanied by movement on the other.

³ The acceleration associated with an earthquake is expressed in terms of a percentage of "g" (one g represents the gravitational acceleration of a free falling body). "Magnitude" refers to the size of an earthquake measured instrumentally.

As we discuss more fully below, intervenors have failed to make a strong showing that the Licensing Board erred in its conclusion as to the adequacy of San Onofre's earthquake design. On the other hand, we entertain serious doubt that the Board was correct (at least on the theory it propounded) in foreclosing intervenors from fully pursuing the earthquake potential of the Cristianitos fault. This apparent legal error, however, is not of major consequence. There is substantial evidence already in the record to the effect that the Cristianitos fault is not capable, and intervenors were able to put on virtually their entire case with regard to the issue. The practical effect of the Board's ruling was to foreclose intervenors from cross-examining two witnesses on a subject that had not been pursued by intervenors to any purpose with other witnesses. This does not strike us as prejudicial error, especially in the absence of an offer of proof as to what of consequence could have been achieved. In view of this and the substantial body of evidence relied upon by the Licensing Board in support of its conclusion as to the appropriateness of San Onofre's earthquake design, we think the Board's apparently mistaken foreclosure ruling was harmless, and that there is no serious threat of irreparable injury in allowing the power plant to start up during the pendency of this appeal. Absent a serious safety concern, the public interest also favors this result.⁴ We therefore deny the stay motion.

I. Background

We draw upon the Licensing Board's partial initial decision to set forth the background (15 NRC at 68-69, 67-68):

Nuclear power plants must be designed to protect the public from the dangers of radioactive releases that might otherwise be caused by an earthquake The linchpin for the regulatory scheme is the "safe shutdown earthquake," or "SSE." The purpose of the SSE determination is "to estimate the magnitude of the strongest earthquake that might affect the site of a nuclear power plant during its operating lifetime." The SSE is defined as "that earthquake which produces the maximum vibratory ground motion for which [critical plant safety systems] are designed to remain functional." [10 CFR Part 100] App. A, §III(c).

⁴ It is also apparent that the applicant will be harmed to some extent if a stay issues and the plant is forced to remain down. Applicant will incur added costs for alternative fuel, construction financing, and keeping the plant in a standby condition. See Affidavit of Robert Dietch in Opposition to Intervenor's Application for a Stay of Low Power License (filed February 8, 1982) at 4-6. Thus the third factor — harm to other parties — also points to denial of stay.

Large earthquakes only occur on pre-existing active faults. Therefore a particular active fault capable of producing an earthquake, which would in turn generate the strongest ground motion at the site — sometimes called the “controlling geologic feature” — must be selected. Taking into account historic earthquake data, the distinctive geology of the area, prevailing stresses in the earth’s crust, and other factors, seismologists make expert judgments about [the] maximum magnitude earthquake — *i.e.*, the “safe shutdown earthquake” — that could occur on that feature.

• • • •

[T]he San Onofre facilities are located on an 800 acre site within the United States Marine Corps Base, Camp Pendleton, California. The site fronts on the Pacific Ocean and is about five miles down the coast southeast from San Clemente, California.

Levels of seismic activity vary significantly in different parts of Southern California. The areas of highest seismicity are on and near the San Andreas and San Jacinto fault systems, the present boundary between the Pacific and North American plates. Seismic activity generally decreases westward away from the plate boundary. The nearest approach of these plate boundary fault systems to San Onofre is about forty-five miles. The coastal region around San Onofre has experienced relatively moderate seismic activity during the past two centuries for which historic records of earthquakes exist.

There are a number of offshore faults in the coastal waters off Southern California, some of which are active. Of greatest concern to San Onofre is an offshore structure beginning with the Newport-Inglewood Zone of Deformation near Long Beach, passing the facility about eight kilometers offshore as the South Coast Offshore Zone of Deformation, and extending south to the San Diego area as the Rose Canyon Fault Zone. This entire structure, extending from near the Santa Monica Mountains to San Diego, is known as the Offshore Zone of Deformation or “OZD.” As will be seen, one of the disputed issues in this proceeding is whether the OZD is a single, throughgoing fault, or whether it is comprised of separate segments of faults or “zone of deformation.”

About one-half mile from the facility the Cristianitos fault is clearly expressed in the sea cliffs. The Cristianitos is the closest significant geologic feature to San Onofre. It proceeds inland from the sea cliffs for about 25-30 miles and appears to die out about one mile offshore. The Cristianitos has long been considered to be inactive [footnotes omitted].

San Onofre is built to withstand safely a magnitude 7.0 earthquake occurring at the point on the OZD nearest the plant (eight kilometers) — an earthquake that could generate a peak ground acceleration to shake the plant site with two-thirds the force of gravity (0.67g). The Licensing Board examined the propriety of that design basis earthquake looking to the historic record, the characteristics of the OZD, and the various earthquake methodologies that had been developed separately by the licensee and the NRC staff for this case. Having held 25 days of evidentiary hearings — most devoted to seismic issues — the Board found, among other things, that San Onofre was conservatively designed. The Board noted that in the opinion of the NRC staff seismologist, Dr. Leon Reiter, San Onofre is probably the most conservatively designed of some 30 nuclear power plants he has reviewed. *Id.* at 75, 141-42, 184-85.

II. The Cristianitos Fault

A. The Foreclosure Ruling

The Cristianitos fault did not control the seismic design of San Onofre because it had long been an inactive (not capable) fault. *Id.* at 68-69.⁵ The Board did recognize, however, that “[i]f the Cristianitos were shown to be a capable fault, it would certainly be significant, and perhaps crucial to the safety of the San Onofre facility.” *Id.* at 77-78.⁶

Intervenors’ principal argument on this stay motion is that they were illegally precluded from fully litigating their case that the Cristianitos fault is capable. The Licensing Board foreclosed that issue because the intervenors failed to make a sufficient showing of changed circumstances since 1973 when the construction permit was issued. *Id.* at 78. The crux of the Board’s ruling was its belief that where an issue, such as the capability of the Cristianitos fault, was known at the construction permit stage and underwent intensive staff scrutiny *anyone* who could have litigated the issue (even if as here, no one had) was foreclosed at the operating license stage absent newly discovered evidence.

⁵ The finding of inactivity was supported by a detailed analysis set out in the NRC staff’s Safety Evaluation Report, and in testimony of applicant and staff witnesses which included an updated analysis since the time the construction permit was issued in 1973. See, e.g., Staff Exh. 1, “Safety Evaluation Report,” NUREG-0712 (February 1981), at 2-33 through 2-52 [SER]; Testimony of Dr. Shawn Biehler on Contention 1 at 5-9; Testimony of Dr. David G. Moore on Contention 2 at 11-17; Testimony of Dr. Roy J. Shlemon on Contention 2 at 5-9; Supplemental Testimony of Anthony Thomas Cardone, fol. Tr. 5563, at 4; Supplemental Testimony of Dr. Reiter, fol. Tr. 5566, at 2 and Tr. 5574.

⁶ But it is also possible that the Cristianitos fault, even if capable, could not generate peak ground acceleration beyond that already accounted for.

The Licensing Board recognized that its foreclosure ruling went beyond the common law principles of res judicata and collateral estoppel, doctrines which we have held are generally applicable to NRC proceedings. *Alabama Power Co.* (Joseph M. Farley Nuclear Plant, Units 1 and 2), ALAB-182, 7 AEC 210, 212-16 remanded on other grounds, CLI-74-12, 7 AEC 203 (1974); *Houston Lighting & Power Co.* (South Texas Project Units 1 and 2), LBP-79-27, 10 NRC 563, 566 (1979), *aff'd*, ALAB-575, 11 NRC 14 (1980). See also *Toledo Edison Co.* (Davis Besse Nuclear Power Station, Units 1, 2 and 3), ALAB-378, 5 NRC 557, 563 (1977).⁷ Neither of those doctrines would have barred intervenors from litigating the capability of the Cristianitos fault — whether or not based on newly discovered evidence or changed circumstances — because intervenors in this proceeding were neither parties to nor in privity with the parties who participated in the construction permit proceeding.⁸ As the Board succinctly put its position (Tr. 5192):⁹

If, for example, the Sierra Club litigates something in 1973, there is no reason in our view why the Union of Concerned Scientists should be able to litigate the same thing eight years later.

At least from our preliminary review of the matter, it seems to us that the Board's novel foreclosure ruling may be in error. It is at odds with generally recognized judicial principles and is premised upon the belief that organizations or persons who share a general point of view adequately represent one another in Commission licensing proceedings.

We doubt that so expansive a reading of the concept of adequate representation is sustainable. The standard for determining whether persons or organizations are so closely related in interest as to adequately represent one another — and thus to foreclose further litigation — is already provided for in the "privity" concept, which requires legal account-

⁷ The Supreme Court has described the doctrines of res judicata and collateral estoppel, as follows:

Under the doctrine of res judicata, a judgment on the merits in a prior suit bars a second suit involving the same parties or their privies based on the same cause of action. Under the doctrine of collateral estoppel, on the other hand, the second action is upon a different cause of action and the judgment in the prior suit precludes relitigation of issues actually litigated and necessary to the outcome of the first action.

Parklane Hosiery Co., Inc. v. Shore, 439 U.S. 322, 326 n.5 (1979).

⁸ See n.7, *supra*. See also *Dreyfus v. First Nat'l Bank of Chicago*, 424 F.2d 1171, 1175 (7th Cir.), *cert. denied*, 400 U.S. 832 (1970). We need not reach the question whether the doctrines would be inapplicable as well because the capability of the Cristianitos fault was not a contested issue in the construction permit proceeding.

⁹ The passage quoted in text is a somewhat stronger case for foreclosure than that which was actually before the Licensing Board because, as noted above, the capability of the Cristianitos fault was not a contested issue at the construction permit hearing.

ability between the two groups or virtual representation of one group by the other. Even in its broadest readings the privity concept has not encompassed the situation of a generally shared viewpoint.¹⁰ In a related context the Supreme Court has noted that "the burden of making [the] showing [that representation may not be adequate] *should be treated as minimal.*" *Trbovich v. United Mine Workers of America*, 404 U.S. 528, 538 n.10 (1972) (emphasis added). Similarly, the District of Columbia Circuit has found existing representation inadequate because the parties' interests "*may not coincide*". *Natural Resources Defense Council v. Costle*, 561 F.2d 904, 912 n.41 (1977) (emphasis added). In short, we think the judicial doctrines of res judicata, collateral estoppel, and privity provide the appropriate bases for determining when concededly different persons or groups should be treated as already having had their day in court. We see no public policy reason why our administrative proceedings warrant a looser standard.

This is not to say that the Commission is legally precluded from placing additional limitations upon the issues that may be litigated at the operating license stage. For one thing, as reflected by recent amendments to its regulations, the Commission may entirely eliminate certain issues from operating license consideration on the ground that they are suited for examination only at the earlier construction permit stage.¹¹ Short of that, the Commission has considerable discretion to provide *by rule* that *any* issues which were or could have been raised by a party to the construction permit proceeding will not be entertained at the operating license stage except upon a showing of "changed circumstances" or "newly discovered evidence". Our point is simply that, at least insofar as safety issues are concerned, to date the Commission has seen fit to pursue neither of these courses. The fact that the Commission has chosen to act *by rule* when excluding certain NEPA issues indicates that safety issues not addressed by rule are not now excluded, nor do they carry a newly discovered evidence burden for their litigation. As matters now stand, Commission practice (as established in *Farley* and other cases, *supra*, p. 695) still requires that the litigability of such issues at the operating license stage be determined with reference to conventional res judicata and collateral estop-

¹⁰ For a discussion of the privity standard, see generally *Southwest Airlines Co. v. Texas International Airlines*, 546 F.2d 84, 95 (5th Cir.), *cert. denied*, 434 U.S. 832 (1977). See also *United States v. Trochee-Carson*, 649 F.2d 1286, 1303 (9th Cir. 1981); *United States v. ITT Rayonier, Inc.*, 627 F.2d 996, 1003 (9th Cir. 1980); *Pollard v. Cockrell*, 578 F.2d 1002, 1008-09 (5th Cir. 1978); *Expert Electric, Inc. v. Levine*, 554 F.2d 1227, 1233 (2d Cir.), *cert. denied*, 434 U.S. 903 (1977).

¹¹ See 47 *Fed. Reg.* 12940 (March 26, 1982), which precludes litigation of the National Environmental Policy Act issues of need for power, alternative sites, and alternative energy sources unless otherwise ordered by the Commission.

pel principles, which necessitate for their application an identity, or privity, of parties. This being so, we doubt that the Board below was free to bar the present intervenors from raising the matter of the capability of the Cristianitos fault on the ground that the matter could have been (albeit was not) raised by a party to the construction permit proceeding.¹²

B. Non-Prejudicial Error

1. While the Licensing Board's foreclosure ruling may well be erroneous it had little, if any, impact on the proceeding. Intervenors' counsel advised us at oral argument that the record available for appellate review is deficient only in the absence of cross-examination of staff witnesses Dr. Reiter and Mr. Cardone. Whatever direct testimony intervenors had to present on the capability of the Cristianitos fault is fully set out in the record though formally stricken in major part), and intervenors had adequate opportunity to cross-examine the applicant's witnesses. See Appeal Tr. 14-15, 19-22, 93-97 [App. Tr.].

We have reviewed the record material (including that which was formally stricken) and do not find the gap in cross-examination prejudicial. Intervenors did in fact cross-examine Mr. Cardone and Dr. Reiter as to post-1973 evidence dealing with the potential capability of the Cristianitos fault. See generally Tr. 5744-56, 6684, 6718-38. What they were precluded from pursuing by virtue of the Licensing Board's foreclosure ruling was pre-1973 information bearing on the fault's capability. But as to that, intervenors had had virtually no questions to ask when cross-examining Dr. Biehler, the applicant's consultant, whose testimony covered the Cristianitos fault in its full historical range.¹³ And intervenors do not quarrel with the scope of their cross-examination of Dr. Biehler. See p. 692, *supra*. Nor did intervenors make an offer of proof as to what would have been elicited through cross-examination of Mr. Cardone and Dr. Reiter as to pre-1973 matters. In these circumstances, the Board's foreclosure ruling cannot be said to have prejudiced intervenors' case.¹⁴

¹² To require a rule change before issues are excluded would also assure that the Commission is called upon to address the specific considerations for dispensing with the opportunity to litigate particular issues before foreclosing a person who was not a party to the previous proceeding. We think this may be preferable to the course chosen by the Licensing Board, which stretches the concept of adequate representation into an unbending exclusionary rule.

¹³ Our review of the transcript reveals only an isolated serious of questions relating to the focal mechanism of a 1967 earthquake. Tr. 3992-93. See n.18, *infra*.

¹⁴ The rule in the federal courts, to which we can look for guidance, is that error may not be predicated upon a ruling which excludes evidence unless a substantial right is affected, and the substance of the evidence is made known by way of an offer of proof or is otherwise apparent. Fed. R. Evid. 103. See generally *United States v. Vitale*, 596 F.2d 688, 689 (5th Cir. 1979), *cert. denied*, 444 U.S. 868 (1980); *United States v. Callahan*, 551 F.2d 733, 738

(CONTINUED)

Moreover, there may well be an alternative reason why intervenors could properly be precluded from challenging the capability of the Cristianitos fault with evidence antedating the construction permit. The issue was simply not within the scope of the contentions set for hearing.¹⁵ Whether or not a person can be foreclosed from litigating an issue that could have been raised in a proceeding to which he was not a party, he certainly can be foreclosed when the issue is not properly raised as a contention in the proceeding to which he is a party.

2. Having reviewed the record materials (as set forth below), we also believe that intervenors have failed to make a strong showing that the Cristianitos fault may be capable. Our view on the merits of that question (and on the seismic issues discussed *infra*), decidedly influences our view on the issues of irreparable injury and the other stay elements. Our statement in *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 2), ALAB-486, 8 NRC 9, 46 (1978) when deciding whether to allow continued operation of that plant during the pendency of a reopened hearing, is fully applicable here:

The standard which perforce governs this determination is an obvious one: will the continued operation of the plant over the period required to complete the additional proceedings be consistent with the requirement that there be reasonable assurance that the public health and safety not be endangered. See 10 CFR 2.104(c)(3); 10 CFR 50.57(a)(3). If not, the facility of course cannot be allowed to continue to operate at this time.

As applied to the case at hand, that standard obviously does not call upon intervenors to show that an earthquake beyond the seismic design of the plant is likely during the pendency of this appeal. It would be enough if apparent inadequacies in the plant's seismic design were sufficient to raise the question whether plant operation would present an undue risk to the public in the event of an earthquake.¹⁶ See *Pacific Gas and Electric Co.*

(6th Cir. 1977); *Hochstadt v. Worcester Foundation for Experimental Biology*, 545 F.2d 222, 226 n.4 (1st Cir. 1976); See also 1 *Weinstein's Evidence* ¶103[3], at 103-27 (1981); 21 *Wright & Graham, Federal Practice & Procedure* §5040 (1977), at 209. Given the line of questioning taken with Dr. Biehler we cannot say that it is apparent what kind of testimony intervenors thought they would have elicited from cross-examination of staff witnesses as to pre-1973 Cristianitos fault matters.

¹⁵ The four seismic contentions dealt with the Offshore Zone of Deformation, the Cristianitos Zone of Deformation (a feature not synonymous with the Cristianitos fault) and the propriety of San Onofre's seismic design in light of *post* construction permit data and techniques. Prior to he hearing the Licensing Board rejected intervenors' proposed contention regarding the Cristianitos fault for lack of specificity. Revised Prehearing Conference Order (May 28, 1981), at 6.

¹⁶ The facts of this case are not so close as to compel us to define how much risk is undue.

(Diablo Canyon Nuclear Power Plant, Unit 1), CLI-81-30, 14 NRC 950 (1981). Absent a greater doubt than we now have in that regard, there is not a significant threat of irreparable injury if San Onofre is allowed to start up during the pendency of this appeal. We turn to the evidence bearing on the question of the capability of the Cristianitos fault.

3. Prior to the 1973 issuance of a construction permit for San Onofre, the applicant had undertaken a comprehensive geologic investigation of the site region including detailed examinations of excavations along the Cristianitos fault, geologic mapping, and field examinations. The Cristianitos fault was seen to be a north trending, west dipping normal fault located along the eastern margin of the Capistrano Embayment. The west side of the fault was formed in association with the development and opening of the embayment during Late Miocene and Early Pliocene time (i.e., between about four and ten million years ago). Unbroken terrace deposits at least 125,000 years old overlay the Cristianitos fault and showed that the fault had been inactive for at least that time. SER at 2-34, 2-49; Testimony of Dr. Perry L. Ehlig on Contention 4 at 28; Testimony of Dr. Moore on Contention 2 at 16-17, 44; Testimony of Dr. Shlemon on Contention 2 at 8-9.

After issuance of the construction permit and at the staff's request, the applicant undertook a series of further investigations. These included a detailed investigation of two small earthquakes of magnitude 3.3 and 3.8 which occurred on January 3, 1975 near San Juan, Capistrano.¹⁷ The earthquakes were of concern to the staff: had the Cristianitos fault generated them it would constitute significant evidence that at least a portion of the fault was capable. The applicant's investigations included a geomorphic study, an evaluation of microseismic events, a study of focal mechanisms, the construction of a subsurface contour map, an updating of historic seismicity, and geophysical surveys. SER at 2-38.¹⁸ Through calibration blasts Dr. Biehler developed a model to locate more accurately the epicenters of the small earthquakes and to fix limits on their hypocentral depths.¹⁹ The difference in faulting style and spatial separation from the Cristianitos fault led him to conclude that the events could not be asso-

¹⁷ The strong motion instruments at San Onofre, approximately 20 kilometers (km) away from the earthquakes, were not triggered, indicating that ground motion had attenuated to less than 0.01g. So too a field survey along the Cristianitos fault did not locate any ground surface rupture. Testimony of Dr. Biehler on Contention 1 at 5.

¹⁸ A geomorphic study deals with surface features; focal mechanisms describe the manner in which the ground moves during an earthquake. See generally Tr. 3652-53.

¹⁹ The epicenter is the point on the ground surface directly above the source of the earthquake (the hypocenter) from which seismic waves first emanate.

ciated with that fault. Testimony of Dr. Biehler on Contention 1 at 7-8.²⁰ These and other investigations²¹ confirmed the applicant's and staff's opinion that evidence gathered since the construction permit issued did not disturb the earlier conclusion that the Cristianitos fault was not capable. See generally SER at 2-34 through 2-35, 2-49 through 2-50; Testimony of Dr. Moore on Contention 2 at 15-17.

Intervenors presented two witnesses on the capability of the Cristianitos fault. The principal witness, Mr. Richard S. Simons, attempted to show that a number of low magnitude earthquakes could be geographically associated with the Cristianitos fault, thus indicating its activity or capability.²² He plotted the location of instrumentally determined earthquake epicenters in an area surrounding San Onofre,²³ drew a circle about each epicenter the radius of which was equivalent to the error in the position of that epicenter, then drew a line representing the position of the Cristianitos fault. Twenty of the circles intersected the Cristianitos line. This, Mr. Simons asserted, was evidence that the Cristianitos fault should be considered capable.

This evidence is not convincing. Mr. Simons' plot of earthquake epicenters reveals a generally random distribution of epicenters throughout the

²⁰ The motion of the two small earthquakes was strike-slip with a significant thrust component, while one would expect dip-slip movement from the Cristianitos fault. (In a strike-slip fault, the ground on one side of the fault moves horizontally and parallel to that on the other side; in a dip-slip fault, the movement is perpendicular to the strike of the fault. See generally 13 NRC at 917-18; *Glossary of Geology* (2d ed. 1972)). Moreover, the two earthquakes were oriented along the trend of Trabuco Canyon, a significant geomorphological feature, and oblique to the trend of the Cristianitos fault. Beyond differences in faulting style — simply as a matter of geographically locating the earthquake — it was unlikely that either earthquake lay on the Cristianitos fault plane even assuming the shallowest possible dip for the Cristianitos fault. Testimony of Dr. Biehler on Contention 1 at 7-8.

²¹ A number of other investigations were conducted after the construction permit issued to resolve questions bearing upon the capability of the Cristianitos fault. For example, at the staff's request the licensee undertook trenching to expose the base of Holocene alluvium (i.e., recent (in the last 10,000 years) stream deposits). The alluvium showed no evidence of fault displacement, nor did the overlying terrace deposits show any evidence of shearing. See Testimony of Dr. Shlemon on Contention 2 at 8-9; SER at 2-34 through 2-39.

²² Because the Licensing Board apparently considered Mr. Simons' testimony dealing with pre-1973 earthquakes to be intertwined with later developments, it applied its foreclosure ruling, to the entirety of his testimony. His testimony was also excluded for lack of probative value. 15 NRC at 76.

²³ These data were obtained from a catalog published by the Seismology Laboratory at the California Institute of Technology for the period 1932 through 1980. Written Testimony of Richard S. Simons, attached as Exh. 1 to Intervenors (sic) Carstens *et. al.* Application for Stay of Low Power License (filed January 27, 1982) [Stay Motion], at 2. That catalog includes an estimate of the error to be associated with the position of each epicenter in terms of distance. The area considered by Mr. Simons was roughly a square, 55 kilometers to a side, containing 127 epicenters.

region.²⁴ Seemingly any line drawn on that plot comparable in length to the Cristianitos fault (approximately 40 kilometers) would be intersected by a number of earthquake epicenter error circles. Following Mr. Simons' reasoning, any such line would define a capable fault. Had Mr. Simons in fact demonstrated that the line representing the Cristianitos fault was intersected more frequently than other randomly drawn lines of comparable length his methodology might provide some basis for associating the Cristianitos fault with earthquake activity.²⁵ But Mr. Simons did not show this, our scrutiny of his plot does not indicate that carrying out this procedure would support his thesis, and more thoroughgoing investigations undertaken by the applicant and staff showed the Cristianitos fault to be inactive. See pp. 699-700, *supra*. We conclude that the Licensing Board did not err in not crediting Mr. Simons' testimony.

Intervenors' other witness on the activity of the Cristianitos fault, Mr. Mark R. Legg, relied upon Mr. Simons' analysis for predicating the fault's activity. See Tr. 5204-05. What we have said of Mr. Simons' testimony therefore, is fully applicable here as well.²⁶ Additionally, Mr. Legg sought to show that inactivity of the Cristianitos fault should not be inferred from the fact that the regional stress

²⁴ On cross-examination, Mr. Simons acknowledged that the arrangement of earthquake epicenters in the vicinity of San Onofre was generally random. Tr. 4820-21. Indeed, if anything, there is a clustering of epicenters in the northeast quadrant of Mr. Simons' Figure 1 and away from the location of the Cristianitos fault and San Onofre.

Randomness is inherent in the notion of a "halo of seismicity," a concept Mr. Simons recognized as applicable to California and which characterizes the random disposition of small epicenters not associated with known faults. Tr. 4842. Seismicity this low yields peak ground accelerations so small that the design of the plant, 0.67g, can easily cope with them. For example, the 1975 earthquakes 20 kilometers distant from San Onofre produced a peak ground acceleration at San Onofre of less than 0.01g.

Also appearing in the record is a mapping of earthquake epicenters of magnitude 3 and above for the entire Southern California area. Testimony of Dr. Stewart W. Smith on Contention 4 at 5 and Figs. SWS-A, -B, and -C. These figures also demonstrate the generally uniform distribution of small earthquake epicenters throughout the region, as well as concentrated clusters of events associated with faulting. The San Onofre and Cristianitos regions stand out as areas of low seismic activity.

²⁵ As noted *supra* p. 699, applicant did conduct further investigations regarding the issue, especially into the 1975 small magnitude earthquakes. These investigations included calibration blasts recorded by 11 seismographs to develop a local crustal velocity model for the purpose of fixing limits on the earthquakes' hypocentral depths, and a comparative analysis of their focal mechanisms with that of Cristianitos. Mr. Simons' far less sophisticated error-based analysis did not distinguish between the Cristianitos fault and any other randomly located comparable plot.

²⁶ The Licensing Board struck approximately one paragraph of Mr. Legg's prepared testimony in accordance with its ruling that intervenors were foreclosed from litigating pre-1973 information regarding the Cristianitos fault. Tr. 5237-41. The excluded testimony was, in essence, a summary of Mr. Simons' testimony. Its formal rejection was therefore not prejudicial.

field has changed from the time the Cristianitos fault was formed.²⁷ The point is a tangential one, and in any event Mr. Legg conceded on cross-examination that he had no evidence in the history of geology that a listric normal fault (such as the Cristianitos is thought to be) had later undergone left lateral oblique thrust, the type of movement his view posited. Tr. 5246-47. See also Tr. 6392-94.²⁸

Lastly, intervenors point to the uncertainty associated with Dr. Biehler's location of the 1975 earthquakes and argue from that, that their location on the Cristianitos fault cannot be excluded. Dr. Biehler had testified on cross-examination that if one assumed the shallowest possible vertical projection for the Cristianitos fault, and used the maximum standard deviation on hypocentral depth, one of the two events comes very close to the projected line at a depth consistent with the deepest portion of the vertical error bar. Tr. 3965. However, Dr. Biehler also testified that the focal mechanisms of the 1975 earthquakes are inconsistent with that of the Cristianitos fault, and his position was endorsed by the NRC staff seismologist, Dr. Reiter. Tr. 5745-46. Moreover, Dr. Biehler was of the opinion that the hypocentral location of the 1975 events was two to three kilometers above the position of the Cristianitos fault. Tr. 3969-70. Dr. Reiter concurred that it would require an arbitrarily great shallowness of the Cristianitos fault, in disregard of its focal mechanism of a steeply vertical dip-slip fault, to associate the 1975 earthquakes with it. Tr. 5746.

From our review of the record thus far, we think the great weight of the evidence supports the view that the Cristianitos fault is not an active fault. Intervenors have not made a strong showing that they are likely to prevail on that issue by the end of our appellate review. Moreover, the factual controversy is not so close that there is a significant risk of irreparable injury in allowing San Onofre to operate during the pendency of the appeal.

III. The Offshore Zone of Deformation

A. Background

Intervenors other major argument for a stay is that the Licensing Board erred in treating as segmented the Offshore Zone of Deformation, (OZD),

²⁷ The Cristianitos is a dip-slip fault, oriented west-southwest. In mid-Pliocene times (five to six million years ago) the tectonic setting of the region changed from east-west extension to the present stress field which is north-south crustal shortening or compression. Tr. 5204-05; Testimony of Dr. Moore on Contention 2 at 16. Applicant's witness Dr. Ehlig was of the opinion that the present tectonic regime would remain unchanged for at least the next 100,000 years. Tr. 994.

²⁸ A listric normal fault is a fault in which the hanging wall moves downward, usually concluding with a concave-upward surface of fracture. *Glossary of Geology* (2d ed. 1972).

which is the geologic feature that controls the design basis earthquake for San Onofre. This segmentation, we are told, was contrary to an understanding among the parties to assume that the OZD was a continuous throughgoing feature, and had the effect of underestimating the maximum magnitude earthquake for which San Onofre should be designed.

We think that intervenors have misread both the understanding of the parties and the Licensing Board's decision. All understood that the geologic characteristics of the OZD and their relevance to earthquake magnitude were contested matters for the Board to decide, so long as the controversy stayed within the confines of the description of the OZD posited by the NRC staff and its geological consultant, the United States Geological Survey (USGS). As explained below, nothing in the Board's decision contravened the staff and USGS position that, for purposes of conservative nuclear design, the three segments of the OZD should be considered related in some fashion and capable of an earthquake the magnitude of which could be commensurate with the length of the zone.²⁹

B. The Parties' Understanding

At the construction permit hearing the parties stipulated as an issue:

[w]hether, assuming the geologic model set forth in the Regulatory Staff's Safety Evaluation, 0.67g is a reasonably conservative design basis earthquake for San Onofre Nuclear Generating Station Units Nos. 2 and 3.

Southern California Edison Co. (San Onofre Nuclear Generating Station, Units 2 and 3), LBP-73-36, 6 AEC 929, 931 (1973). With regard to the OZD, the Staff's model indicated

[t]he existence of a zone of deformation about five miles offshore from the [San Onofre] site which extends from the Newport-Inglewood fault zone to the north and cannot be disassociated from the Rose Canyon fault zone to the south. The present evidence indicates an extensive, linear zone of deformation, at least 240 kilometers (km) long extending from the Santa Monica Mountains to at least Baja, California. We and our consultants [USGS] consider this zone of deformation to be potentially active and capable of an earthquake whose magnitude could be commensurate with the length of the zone.

Safety Evaluation of the San Onofre Nuclear Generating Station, Units No. 2 & 3 (October 1972), at 15-16. The safety evaluation went on to

²⁹ The three segments of the OZD are, from north to south, the Newport-Inglewood Zone of Deformation (NIZD), the South Coast Offshore Zone of Deformation (SCOZD), and the Rose Canyon Fault Zone (RCFZ).

recommend that the design basis earthquake for the plant be based upon an acceleration of 0.67g from the maximum earthquake likely to affect the site. *Id.* at 16.

While the applicant was of the view that the USGS model for the OZD was unduly conservative and at odds with its geologic characteristics, it nevertheless "agreed to accept the Staff's more conservative view as the basis for their design." 6 AEC at 943.³⁰ That agreement carried through to the operating license hearing. Though reiterating that "the Applicants have never accepted as a matter of substance the throughgoing nature of the offshore zone of deformation", counsel for the utility nevertheless represented that "[w]e are not attempting to relitigate that particular question at this time and it does not appear in any of the issues." Tr. 1046.

The parties also agreed that USGS witness Mr. James F. Devine had correctly outlined the meaning to be attached to the model of the OZD. App. Tr. 24. That the zone of deformation should be considered potentially active and capable of an earthquake the magnitude of which could be commensurate with the length of the zone was not to be taken as indicating that the offshore zone of deformation was a fault zone, or

³⁰ In fuller explanation the Licensing Board there stated (6 AEC at 943):

It has become apparent to the Board, both from the record existing at the start and from the testimony during the hearing, that an honest difference of opinion exists between the experts on the two sides as to the proper geological model to use, i.e., whether there is a long continuous zone of deformation near the site which must be considered as the potential location of a major earthquake, or whether the nearby zone constitutes only a smaller, isolated fault and one need consider only a small earthquake commensurate with that shorter fault and larger earthquakes on more distant faults. The Applicants ultimately (prior to the hearing) agreed to accept the Staff's more conservative view as the basis for their design. Accordingly, they agreed to the stipulation cited in Paragraph 51, *supra*, which specifies that the adequacy of the design basis earthquake will be litigated in the framework of "the geological model set forth in the Regulatory Staff's Safety Evaluation." This model, of course, is the one set forth by the USGS in the quoted sections of report [sic] in Paragraph 59, *supra*. The Board has reviewed the information in the record and the Staff's evaluation of that information and finds that the Staff's model is the appropriate one for use in evaluating the effect of these facilities on the health and safety of the public. We note the Applicants' reluctance to concede that the Staff's model is a true representation of the situation. This was indicated by their effort to introduce prepared testimony attempting to counter the Staff's model and specifically stated in the Applicants' reply to the Staff's proposed findings. As we stated above, the interpretation of the geological data is susceptible to differences of opinion and future discoveries may well prove the Applicants' interpretation to be correct. Indeed, there may even be a small preponderance of evidence presently in their favor. The importance of the matter from a safety point of view and the lack of overwhelming evidence that the Applicants' interpretation is correct, however, require this Board to adopt the more conservative position, i.e., that the Staff's model is the one to be used in evaluating the propriety of an 0.67g design basis earthquake.

capable of rupturing at the same time in a single event. Rather, as Mr. Devine explained (Tr. 5333):³¹

[w]e specifically avoided the term "fault zone." We called it a zone of deformation because there are indeed segments which are not faulted, but instead deformed, folded, for example.

And so when attempting to describe then the earthquake potential one should assign to such a feature, we argued that the three discrete zones should not represent individual fault zones and earthquake magnitudes dependent on each of those individual segments, but instead should consider them all in one segment, for the purpose of estimating earthquake size.

Q That is not the same, however, as saying for example that you are suggesting a single fault capable of rupturing at the same time in a single event, is it?

A As I recall, none of us had the opinion or the position that the entire length could rupture at once, but only that there was indeed some relationship, probably at depth, of these three segments, such that it all should be considered one zone.

In sum, the parties were free to put on evidence about the geologic characteristics of the three OZD segments and the effect of those characteristics on the maximum magnitude earthquake for San Onofre's design, so long as account was taken of the fact that there was indeed some relationship among the three segments.³² Intervenors do not contend that the staff or applicant did otherwise. App. Tr. 25. What the understanding barred was the position that each particular segment of the OZD should have an assigned maximum magnitude earthquake derived from the as-

³¹ In tracing the history of the USGS position as it developed at the construction permit review, Mr. Devine noted (Tr. 5332-33):

The Applicant maintained that there were three discrete components, and put forth an argument that there was not sufficient evidence to cause them to be linked and considered as one fault, and on the other side of the scale, we were not able to demonstrate that they were indeed one fault.

However, in our review at that time, we insisted that for purposes of nuclear design, and for margins of safety and levels of conservatism as we understood them, we felt it appropriate that for that purpose they be considered to be one zone of deformation

³² Contention 4 in the proceeding specifically put the geologic characteristics of the OZD in issue. It reads:

Whether based on the geologic and seismic characteristics of the OZD, including its length, assignment of $M_s 7$ as the maximum magnitude earthquake for the OZD renders the seismic design basis for [San Onofre] inadequate to protect the public health and safety.

M_s stands for "surface wave magnitude". It is a measure of magnitude used to describe earthquakes of about magnitude six and above. See 15 NRC at 101-102. See also 13 NRC at 930-31.

sumption that an earthquake rupture could not proceed from one segment to another.

C. Licensing Board Consideration of the OZD

Intervenors are not likely to persuade us on the merits that the Licensing Board decision was inconsistent with that model. First, intervenors' argument is inherently implausible because its underlying premise is that the Licensing Board took a fact-finding path inconsistent with the evidence presented by *all* the parties.³³ Second, intervenors' argument is refuted by the Licensing Board decision itself. The Board summarized its findings as follows:

The intervenors persistently attempted to show that the OZD was controlled by a major, throughgoing fault capable of rupture along its full length. But apart from Dr. Slemmons testimony (Tr. 6317) that he believed the OZD could be interpreted as a single continuous fault, there was virtually no evidence to support this theory. In our hearings the OZD was repeatedly characterized by other witnesses as a segmented zone. The SER and the witnesses for the Applicants, the USGS and the Staff all characterized the OZD as a discontinuous zone divided into three segments, the NIZD, SCOZD and RCFZ. Witness Allen testified that the zone does not contain a single, continuous well defined fault zone (Tr. 4732). The evidentiary record supports the description of the OZD as some 240 km long, composed of a series of discontinuous, short, en eschelon [sic] fault segments, drag-fold anticlines and synclines, which progressively changes its style of faulting from north to south. Of major significance for us was the uncontested evidence of the San Joaquin Structural High which interrupts or terminates the NIZD at its southern end, a fact which emphasizes the unlikelihood of a throughgoing rupture of the OZD.

51. The Board's findings on the OZD rest heavily upon the exhibits and testimony presented by the Staff and the Applicants. The Intervenors' primary witnesses had not made independent studies of the San Onofre area and that fact was testified to by Dr. Brune (Tr. 4207-4208) and Mr. Legg (Tr. 5156). Nor do the Proposed Findings of Fact of the Intervenors challenge the findings we have presented other than in their attempt to mischaracterize the OZD as a structure controlled by a single, continuous fault capable of rupture along its full length.

³³ We again take note of the fact that intervenors do not contend that the staff's and applicant's evidence was inconsistent with the OZD model. See p. 705, *supra*.

15 NRC at 109. Nothing in the Licensing Board's findings strikes us as inconsistent with the understood OZD model. As Mr. Devine emphasized, the OZD is not a single throughgoing *fault* but rather a zone of deformation. Nor was the USGS of the opinion that the entire length could rupture at once. See p. 705, *supra*.

IV. Other Challenges to the Adequacy of the Seismic Design Basis

A. The Maximum Magnitude Earthquake

Intervenors argue that the Licensing Board erroneously accepted the views of staff witness Dr. David Slemmons, who calculated the "mean" rather than "the properly conservative mean plus one standard deviation (84%)" earthquake that might be expected on the OZD. Stay Motion at 7. Intervenors argue that the properly conservative magnitude range is from $M_S7.3-7.9$, and that the M_S7 figure accepted by the Board³⁴ means that half the earthquakes that occur on the OZD will exceed the magnitude premised for San Onofre's design.

1. Intervenors' argument is refuted by other testimony in the proceeding and stems from what appears to be an improper use of Dr. Slemmons' testimony. As a matter of recorded history the largest earthquake anywhere on the OZD is the 1933 Long Beach earthquake of $M_S6.3$.³⁵ Nowhere along the OZD is there good evidence of the amount of surface displacement that has resulted from a single major past earthquake. Testimony of Dr. Heath on Contention 4 at 22. Dr. Smith concluded that earthquakes larger than $M_S6.5-7.0$ could not have occurred very often over the last million years without producing more impressive geologic deformation than has been seen in the region of the OZD. Testimony of Dr. Smith on Contention 4 at 7. To contend that half the earthquakes that occur on the OZD are expected to exceed the safe shutdown earthquake for San Onofre is totally at odds with these observations.

2. Intervenors' adaptation of Dr. Slemmons testimony fails to take into consideration the conservatism in his methodology. As we explain below, Dr. Slemmons derived estimates of a maximum magnitude earth-

³⁴ 15 NRC at 123.

³⁵ That earthquake occurred on the Newport-Inglewood (NIZD) segment. To assign that earthquake to the South Coast Offshore Zone of Deformation (SCOZD) nearest San Onofre is conservative because (1) the NIZD is closer to the area of high stress at the interaction between the San Andreas fault system and the Transverse Range than are the other segments of the OZD to the south, (2) it has the most prominent surficial anticlines and short but prominent fault scarps, (3) it is coincident with a Mesozoic basement rock discontinuity not known to exist beneath the other segments, and (4) it has a higher level of historical seismicity. Testimony of Dr. Edward G. Heath on Contention 4 at 17.

quake for the OZD by conservatively extrapolating from the maximum earthquakes that had been recorded on similar faults. Thus it would not be appropriate to adjust his final result by yet another standard deviation.³⁶

Dr. Slemmons' preferred method of estimating maximum earthquakes magnitude made use of the observation that, for faults similar to those in the OZD, only a fraction of the total fault length would rupture in an earthquake. The table on page E-14 of his testimony summarizes the historic date for those strike-slip faults he selected. Staff Exh. 1-DBS at E-14. Of 22 earthquakes on 10 major strike-slip faults varying from 272 to 1380 km in length, he selected the 10 maximum rupture lengths to determine the mean of the maximum fractional rupture and its standard deviation.³⁷ His calculated average maximum fractional rupture was 22.1 percent, with a standard deviation of 7.45 percent.

Dr. Slemmons then applied these calculated values to various hypothesized total lengths of the OZD. Assuming the OZD ran 190 km from the northern Santa Monica fault to San Diego Bay yielded an anticipated maximum mean rupture of 44 km (22 percent of 190 km) and a predicted maximum magnitude earthquake of $M_s 6.9$.³⁸ The maximum mean rupture length plus one standard deviation corresponded to a 57 km rupture and a $M_s 7.0$ earthquake. Dr. Slemmons also made calculations for an OZD assumed to be 250 km long which he considered "an extreme length assumption." Staff Ex. 1-DBS at E-13. For a maximum mean rupture of 22 percent, he calculated a maximum magnitude of about $M_s 7.0$. Adding one standard deviation to the maximum mean rupture length, yielded a maximum magnitude of about $M_s 7.1$.

Dr. Slemmons also pointed to further conservatism in his methodology in that if his determination of the maximum percentage rupture for

³⁶ The standard deviation is a measure of the variability in a set of observations. The mean plus one standard deviation for a normal distribution, by definition, encompasses 84 percent of the observations. Technically speaking the standard deviation is the square root of the average of the squared distances of the observations from the mean. R. Levin & D. Rubins, *Applied Elementary Statistics* 95-96 (1980).

Another statistical measure sometimes used is the standard error of estimate. It measures the scatter of observations around a regression line — a line used to estimate the association or relationship between two or more variables. *Id.* at 410, 426. See n.38, *infra*.

³⁷ He did not consider the 12 other earthquakes on these faults for which shorter rupture lengths had occurred.

³⁸ Earthquake magnitude was calculated from the length of fault rupture through a formula Dr. Slemmons derived in his 1977 report utilizing data from 31 strike-slip faults. The general equation he derived was $M_s = 0.597 + 1.351 \log_{10} L$, where L represents rupture length in meters and M_s is the earthquake magnitude from surface waves. Dr. Slemmons did not believe it was appropriate to use the standard error of the estimate for that set of data, 0.694, in conjunction with the method described in the text which already accounts for estimates of error. Tr. 6230-31. Dr. Slemmons also noted that his most recent work would reduce his 1977 standard error of estimate of the maximum magnitude from 0.694 to about 0.2. Tr. 6192, 6307.

strike-slip faults were restricted to faults of a length comparable to postulated lengths of the OZD, lower values for magnitude are adduced. Tr. 6285. See Staff Exh. 1-DBS at E-14. An inspection of the data presented in Dr. Slemmons' table on page E-14 reveals that the fraction of total fault length which ruptures is greater for longer faults than for the shorter ones. For faults nearer in length to the OZD, the Licensing Board noted that the fractional rupture length was only 15-16 percent rather than the 22 percent calculated as the average for all lengths. 15 NRC at 121-23. Applying this percentage to ruptures on the OZD would obviously lead to lower earthquake magnitudes than Dr. Slemmons calculated. *Id.* at 121-22.³⁹ Dr. Slemmons concluded that he has "high confidence in the [choice of a] magnitude of 7" earthquake for the design basis of San Onofre. Tr. 6323.

In sum, Dr. Slemmons' methodology (1) chose the mean of the maximum magnitude earthquakes that had occurred on similar faults, (2) assumed the OZD to be a throughgoing fault, (3) added a standard deviation to the calculated earthquake rupture length, and (4) included in his data longer length faults that had the effect of overstating magnitude. We do not think that intervenors have made a strong showing that it is correct or reasonable to add an additional standard deviation to the earthquake magnitude he estimates, or that the $M_7.0$ magnitude obtained was erroneous.⁴⁰

B. Peak-Ground Acceleration

The determination of the maximum magnitude earthquake that might affect San Onofre is only one step toward the most critical portion of the

³⁹ This Board notes that restricting the data to faults of 410 km or less results (on that limited data base) in a maximum percentage rupture of about 14.2 plus or minus (\pm) 3.4 percent. For an assumed 240 km OZD, that maximum percentage rupture plus one standard deviation yields an estimated magnitude of $M_6.8$.

⁴⁰ The choice of a $M_7.0$ safe shutdown earthquake for San Onofre is amply supported by other expert testimony in the record. Thus applicant's expert, Dr. Heath, found the area surrounding the San Onofre site to have one of the lowest historic levels of seismicity in Southern California, with every expectation of remaining so. Testimony of Dr. Heath on Contention 4, Figures EGH-F and EGH-G. He thought that the $M_6.3$ 1933 Long Beach earthquake on the Newport-Inglewood zone of deformation may be close to the maximum for the zone. *Id.* at 20. Dr. Heath also carried out an analysis by which he related the maximum magnitude earthquake expected on a strike-slip fault to the geologic slip-rate on the fault. Though it appears that this is a somewhat new approach, the results support assigning M_7 as the maximum earthquake on the OZD. *Id.* at 23-28 and Figure EGH-M.

So too, as already noted *supra*, p. 707, Dr. Smith concluded that earthquakes larger than about $M_{6.5-7.0}$ could not have occurred very often over the past million years without producing more impressive geologic deformation than what is seen in the region of the OZD. Dr. Ehlig, another applicant witness, concluded that the features of the OZD — its geologic strain rate, regional tectonic setting, and "[t]he absence of extensive and/or throughgoing fault ruptures in near-surface strata along much of the OZD" — all support earthquakes of less than about M_7 . Testimony of Dr. Ehlig on Contention 4 at 21-22.

seismic design, establishing the ground motion properties of the site. This latter determination is meant to express the impact at the plant site of the maximum earthquake should it occur at the point on the controlling fault nearest the site. Ground motion properties are usually summarized through the choice of a peak ground acceleration (PGA), or "g" value, expressed as a percentage of the acceleration produced by gravity. Once the peak acceleration is determined it becomes the anchor point for the design response spectrum for the plant.⁴¹

The Board discussed at length the testimony relating to ground motion for the San Onofre site and the related matters of peak ground acceleration and response spectra, concluding that the seismic design bases set at the construction permit hearing were adequate. 15 NRC at 123-150⁴² Intervenor contest that conclusion, alluding to several claimed errors affecting the plant's design: (1) inadequate weight was given to the testimony of USGS scientist Dr. David M. Boore that for a $M_{5.7}$ earthquake the peak ground acceleration could be as high as 0.83g; (2) a vertical motion spectrum anchored at two-thirds that of horizontal motion is unduly low; (3) Dr. Enrique Luco's higher peak ground acceleration estimates were wrongly rejected, and (4) the effect of seismic wave focusing which, if credited, also would have resulted in a higher peak ground acceleration, was ignored. We discuss each point in turn.

⁴¹ The plant's seismic design is based on a response spectrum that is a graphic representation of how a structure or component will respond to earthquake motion that includes the assumed peak ground acceleration.

The peak ground acceleration is not in and of itself of significance because the anchor point on the response spectrum is typically at or above 33 cycles per second, a frequency beyond the natural frequencies of a nuclear power plant or its mechanical systems. The importance of PGA relates to the fact that the accelerations at lower frequencies — those within the range of concern for a nuclear power plant — are derived from the response spectrum anchored at a specific PGA. See generally, NRC Regulatory Guide 1.60 (Rev. 1, December 1973). The higher the PGA, the higher will be the response of structures at other frequencies of interest.

For further discussion of response spectra in general and with specific regard to San Onofre, see Testimony of Dr. Robert L. McNeill on Contention 4 at 6-19. See also *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 & 2), ALAB-644, 13 NRC 903, 923-25, and nn.40, 43.

⁴² The seismic design criteria for San Onofre can be summarized as a site specific response spectrum for horizontal motion, anchored at a high frequency acceleration of 0.67g, with a vertical spectrum set at two-thirds of that for horizontal motion (i.e., vertical anchor point acceleration 0.44g). At the construction permit stage for San Onofre this characterization was established to represent ground motion associated with an Intensity X earthquake. For the operating license proceeding, consistent with more recent practice, the NRC required the applicant to show that the maximum reasonable earthquake associated with the OZD would be one of magnitude $M_{7.7}$, having the same ground motion properties discussed above (0.67g etc.). See SER at 2-50 through 2-51, 2-66 through 2-68.

1. Dr. Boore's Methodology

Intervenors claim that the Licensing Board "misused, misconstrued, and did not give sufficient weight to" the testimony of Dr. Boore of the USGS, whom they characterize as the "only truly independent witness" on the subject of peak ground acceleration.⁴³ Dr. Boore was co-author of a paper that predicts PGA at various distances from earthquakes of different magnitudes. Interv. Exh. 28. For San Onofre, situated eight km from a possible $M_{5.7}$ earthquake, Dr. Boore's method yielded a mean PGA of 0.46g, and a mean plus one standard deviation value of 0.83g. Tr. 6559.⁴⁴

Our review of the record and the Board's decision leads us to conclude that the Board fairly considered Dr. Boore's testimony and adequately explained why his predictions were not reliable for San Onofre. Dr. Boore and his co-author themselves stated that "[f]or distances less than 40 km from earthquakes with M greater than 6.6 the prediction equations are not constrained by data, and the results should be treated with caution." Interv. Exh. 28 at 17. In discounting the reliability of Dr. Boore's model the Licensing Board correctly noted that an appropriate model of peak ground acceleration should be "chiefly controlled by the data rather than by assumptions in the model." 15 NRC at 134.⁴⁵ When Dr. Boore on cross-examination was asked what the effect would be of eliminating the data beyond 50 km, he stated that the correlation revised in that manner gave predictions for San Onofre conditions of 0.31g for mean PGA, and 0.57g for the mean plus one standard deviation. Tr. 6609-10. These values are not greatly at variance with other witnesses' predictions.⁴⁶ Further, applicant's witness Dr. Idriss was of the opinion that the standard de-

⁴³ As noted *infra*, n.46 the USGS position (as opposed to Dr. Boore's position) was that 0.67g was an appropriate PGA for San Onofre.

⁴⁴ Dr. Boore also considered it appropriate that these values be reduced by dividing them by a factor of 1.13 (*i.e.*, to 0.41g and 0.73g) in accordance with the practice of using the average of the two components of recorded horizontal peak acceleration. Tr. 6559-61.

⁴⁵ Applicant's witness Dr. Smith suggested that Dr. Boore's correlations for PGA were controlled by data at large distances from the earthquakes. Testimony of Dr. Smith on Contention 1 at 4-7; Tr. 3261-74.

⁴⁶ The 0.67g peak ground acceleration value for San Onofre was first set on the advice of the USGS at the construction permit hearing and was adhered to by the USGS for the operating license proceeding. See 6 AEC at 942-45; SER, Appendix G at G-5.

The applicant's primary basis for a PGA value was an analysis of 192 PGA recordings from 22 earthquakes by Dr. Lawrence H. Wight. The study resulted in a mean PGA of 0.33g and mean plus one standard deviation value of 0.52g. Testimony of Dr. Wight on Contention 4 at 6-7; Appl. Exh. 11. A similar analysis by applicant's witness Dr. I.M. Idriss yielded a mean plus one standard deviation value for PGA of 0.63g. Testimony of Dr. Idriss on Contention 4 at 7-13. The applicant also used theoretical modeling techniques to determine ground motion characteristics for the site resulting from M_{7} events on the OZD. Testimony of Dr. Gerald A. Frazier on Contention 4 at 3-21. These results were consistent with those of the empirical studies of Drs. Wight and Idriss. *Id.* at Figs. GAF-C and -D.

viation computed in Dr. Boore's paper was too great for predictive confidence, particularly for close-in locations. Tr. 1737-38.

2. High Peak Vertical Accelerations

Intervenors claim the Licensing Board erred in not being concerned that during certain recent earthquakes, most notably the M_{6.9} Imperial Valley earthquake of 1979, peak vertical accelerations had been recorded which were greater than two-thirds of the horizontal peak acceleration, the ratio chosen for San Onofre's design.⁴⁷ Again, we think the Board adequately explained its reason for believing that high peak vertical accelerations were not significant for the structural safety of San Onofre.

The reasons were three-fold. First, the vertical peaks were of very high frequency, and had little structural damage associated with them. Second, the design of San Onofre assumes that the significant ground motion from all components occurs simultaneously while in fact the recorded high vertical peaks occurred early on, before the maximum horizontal motions. Testimony of Dr. Frazier on Contention 1 at 15-21.⁴⁸ Third, Dr. McNeill, who derived the spectra used for San Onofre's design, noted that acceleration values, rather than acceleration ratios, are the values of design significance. The design spectra for San Onofre, horizontal and vertical, lie above that associated with the Imperial Valley earthquake of 1979 at all frequencies for relevant distances. See Tr. 4008-09, 4024.⁴⁹ We find that the Board's explanation suffices for rejecting the significance of the higher than anticipated ratio of vertical to horizontal motion associated with the Imperial Valley earthquake of 1979.

3. Dr. Luco's Testimony

Intervenors also claim that the Board ignored the testimony of Dr. Luco, a Board witness who was called to testify on the earthquake modeling results submitted by the applicant. See, e.g., Testimony of Dr. Frazier on Contention 4; Appl. Exhs. 21, 24. In summarizing his criticism of Dr. Frazier's model, Dr. Luco suggested, without elaboration, that it is possible to have peak ground accelerations of 0.8g from a M_{6.5} earth-

⁴⁷ The design peak vertical acceleration for San Onofre is anchored at 0.44g, or two-thirds its peak horizontal acceleration of 0.67g. See n.42, *supra*.

⁴⁸ Dr. Frazier also noted that in soft sediment there is an upward bias in recorded velocity peaks. Those soft sediment soil conditions are closer to the conditions at Imperial Valley than to the more rock like conditions at San Onofre. Testimony of Dr. Frazier on Contention 1 at 15. See also SER at 2-66.

⁴⁹ The data indicate that even a mean plus one standard deviation vertical response spectrum formed using the near-field data for the Imperial Valley earthquake of 1979 only exceeds the vertical design spectrum for San Onofre at a few frequencies. Appl. Exh. 1, Response to NRC Question 361-64.

quake, a factor of two higher than Dr. Frazier's model would have predicted.⁵⁰ Tr. 4496-97. However, Dr. Luco was unwilling to recommend that or any other "g" value for San Onofre, in view of what is in his opinion, an uncertain definition of acceptable risk in NRC regulations.

Because of the considerable amount of evidence and analysis in the proceeding specifically on the matter of peak ground acceleration (see pp. 711-712, *supra*) we accept, at least for purposes of this stay motion, the Licensing Board's judgment that the weight of the evidence does not support Dr. Luco's position. 15 NRC at 138-140.

4. Effects of Focusing on Peak Ground Acceleration

Finally intervenors claim that the Board unduly minimized the effects that focusing would have to increase earthquake ground motion. Again, we find the criticism wide of the mark.

Focusing is the compression of seismic waves in the direction that a fault ruptures. The Licensing Board noted that the witnesses did not dispute that focusing is a real, observed phenomenon. Instead, the dispute centered on how much higher peak ground accelerations might realistically be expected to result from focusing. 15 NRC at 147-48. As to this, applicant's witnesses testified that the maximum spread between the focused and "defocused" peak ground accelerations would be approximately a factor of two which was already accounted for in their calculations. Tr. 3255-60 (Dr. Smith); see also Testimony of Dr. Frazier on Contention 4 at 12-13. Intervenors witness, Dr. James N. Brune, thought it was possible that focusing could lead to PGAs five times higher in the direction of rupture than in the defocused direction. Tr. 4365. However, he noted that at the frequencies of interest for San Onofre, so large a disparity has never been borne out in any kind of large earthquake, and the observed effects have been in the range of a factor of two as applicant's witnesses testified. Tr. 4365-67.

The Licensing Board also took note of Dr. Smith's testimony that the San Onofre facility does not stand directly in the path of the OZD, the controlling geologic feature, but is eight kilometers off to the side of it and hence not positioned to experience the effects of focusing. The Board summarized its discussion of the issue as follows:

All of the available evidence indicates that where focusing does occur, the resulting differences in high and low PGAs will be about a factor of 2, and that lesser differences will obtain between

⁵⁰ Dr. Luco buttressed his opinion by referring to the results from two published sources. Tr. 5006-07. One of the reports referenced by Dr. Luco, USGS-Circular 672, has been superseded by later USGS publications that predict lower values of PGA. See Tr. 5065.

median and high PGAs. Moreover, there are no major active faults in the site vicinity "focused" — i.e., aimed at — the site. Furthermore, the Intervenor's concerns about focusing are based in the record on little more than its possibility, and an alleged lack of sufficient data. They have failed to advance a plausible theory supporting these concerns.

15 NRC at 150. We cannot say that intervenors are likely to prevail on their critique of the Licensing Board's handling of focusing.⁵¹

• • • •

In view of the extended length of time it takes for a nuclear power plant to proceed from fuel loading and testing to achievement of criticality — some three to four months — we have been able to gain a greater familiarity with the record and the issues than is normally the case when ruling upon a stay motion. Our review at this juncture leaves us with the belief, explained in the preceding pages, that the asserted errors advanced by intervenors in their stay motion do not cast serious doubt on the propriety of San Onofre's seismic design. Nor has the one questionable Licensing Board ruling — that on foreclosure — worked, in practice, to prejudice intervenors' case.

For all the foregoing reasons, intervenors' motion for a stay pending appeal is *denied*.

It is so ORDERED.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the Appeal Board

⁵¹ Intervenor's also allege that the Licensing Board wrongly relied on the theory of saturation of earthquake ground motion to decrease PGA. Intervenor's are mistaken. To the contrary, the Licensing Board said that "given the meager and rather confused record on saturation, [we do] not ascribe substantial significance to the [saturation] phenomenon." 15 NRC at 000 (slip opinion at 147). While we do not necessarily agree with the Licensing Board's characterization of the record on the matter of saturation, we find no harm to the intervenor's in the Board's assessment of the concept.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Louis J. Carter, Chairman
Dr. Oscar H. Paris
Frederick J. Shon

In the Matter of

Docket Nos. **50-247-SP**
50-286-SP

**CONSOLIDATED EDISON
COMPANY OF NEW YORK**
(Indian Point, Unit No. 2)

**POWER AUTHORITY OF THE
STATE OF NEW YORK**
(Indian Point, Unit No. 3)

April 2, 1982

The Licensing Board rules on petitions to intervene and request to participate pursuant to 10 CFR §2.715(c).

INTERVENTION: INTERESTED STATE

Section 2.715(c) of the Commission's Rules of Practice does not limit licensing boards to the recognition of a sole state representative.

INTERVENTION: INTERESTED STATE

The authority of the Licensing Board to admit the Attorney General of the State of New York as a representative of an interested state is not limited by the provisions of a New York State law delegating responsibility for representation of the state to the New York State Energy Office.

INTERVENTION: INTERESTED STATE

A Licensing Board may require a representative or agency of an interested state to indicate in advance of the hearing the subject matter on which it wishes to participate, but such a showing is not required for admission pursuant to 10 CFR §2.715(c).

INTERVENTION: INTERESTED STATE

A party admitted as an interested state under the provisions of 10 CFR §2.715(c) may not reserve the right to intervene later under §2.714 with full party status. A petition to intervene under the provisions of the latter section must conform to the requirements for late-filed petitions.

RULES OF PRACTICE: STANDING TO INTERVENE

Where the petition for intervention of the Friends of the Earth was signed by an official of the organization who herself had the requisite personal interests to support an intervention petition, the organization also had standing.

RULES OF PRACTICE: STANDING TO INTERVENE

The fact that the sole or primary purpose of an organization is to oppose nuclear power in general or the facility the subject of the proceeding in particular is not a basis for denying the organization's petition to intervene.

RULES OF PRACTICE: STANDING TO INTERVENE

The Union of Concerned Scientists (UCS) was not required to produce an affidavit from one of its members or sponsors specifically authorizing it to represent the interests of that member or sponsor in this proceeding. The organization's opposition to continued operation of the Indian Point plant and its steps taken to effectuate that opposition were clearly germane to UCS's expressed purposes, and the Board could assume that UCS's sponsors in the vicinity of Indian Point were aware of those activities. Accordingly, UCS could be presumed to represent the interests of such sponsors. *Virginia Electric and Power Company* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-536, 9 NRC 402 (1979).

RULES OF PRACTICE: STANDING TO INTERVENE

Where a non-membership organization has a well-defined purpose which is germane to the proceedings, its sponsors can be considered equivalent to members where they financially support the organization's objectives and have indicated a desire to be represented by the organization. Therefore, where an individual UCS sponsor has standing, this provides a sufficient nexus between the organization and the proceeding to permit representational standing by UCS.

MEMORANDUM AND ORDER

(Ruling on Petitions to Intervene and Agenda for Second Special Prehearing Conference)

I. INTRODUCTION

Eighteen petitions to intervene and requests to participate (petitions) have been filed in this special Investigative Proceeding.¹ Additional pleadings in the form of responses to petitions, amendments to petitions, listings of contentions, objections to contentions, and answers to objections have been filed by the parties (the NRC Staff and the Licensees) and the petitioners. Rulings are made herein with regard to the petitions upon consideration of the foregoing record and the First Special Prehearing Conference held on December 2, 1981. Although some petitions have been granted provisionally or to a more limited extent than was requested, none have been denied in their entirety.

Nine petitioners are admitted to intervene pursuant to 10 CFR §2.714. They are: the Honorable Richard L. Brodsky (Brodsky), Friends of the Earth (FOE), the Greater New York Council on Energy (GNYCE), the New York City Audubon Society (Audubon), Parents Concerned About Indian Point (Parents), Rockland Citizens for Safe Energy (RCSE), the Union of Concerned Scientists and New York Public Interest Research Group (UCS/NYPIRG), the West Branch Conservation Association (WBCA), and the Westchester Peoples Action Coalition (WESPAC).

Nine representatives or agencies of interested states, counties, or municipalities are admitted to participate pursuant to 10 CFR §2.715(c). They are: the Attorney General of the State of New York (Attorney General), the New York State Energy Office (Energy Office), the County of Westchester (County), the Metropolitan Transportation Authority (MTA),

¹ In our November 13, 1981 Memorandum and Order we listed seventeen petitions requesting leave to intervene pursuant to 10 CFR §2.714 or participate pursuant to 10 CFR §2.715. Subsequently we received another, untimely petition which is included herein.

the Council of the City of New York (NYC Council), the Port Authority of New York and New Jersey (Port Authority),² the County of Rockland (Rockland), the New York State Assembly and Its Special Committee on Nuclear Power Safety (State Assembly), and the Village of Buchanan (Village).

In ruling on the petitions to intervene pursuant to Section 2.714, we have studied each petitioner's contentions to determine whether the petitioner has formulated at least one acceptable contention. The rulings here deal with contentions only to that extent. In a further order to be issued shortly following the Second Special Prehearing Conference, a formulation and listing of all contentions to be litigated in this proceeding will be set forth. We turn now to a consideration of petitions, beginning with requests to participate pursuant to 10 CFR §2.715(c).

The regulatory and case-law requirements for intervention and for participation as an "interested state"³ have been very well reviewed by the NRC Staff in its "Response of the NRC Staff to Petitions for Leave to Intervene and Requests for Participation as Interested States Filed in Response to the NRC Federal Register Notice of October 7, 1981," dated November 24, 1981, and need not be reviewed again here. In making rulings on the petitions we have been guided by our interpretation of the degree of compliance of the petitions, plus amendments thereto, with the aforesaid regulations and law, and by the instructions to this Board contained in the Commission's orders of January 8 and September 18, 1981.

II. REQUESTS TO PARTICIPATE PURSUANT TO 10 CFR §2.715(c)

A. Attorney General of the State of New York

The Attorney General of the State of New York, Robert Abrams, petitioned to participate in this proceeding as a representative of the State of New York on October 29, 1981. The NRC Staff responded on November 24, 1981, stating that it supported and welcomed the Attorney General's request to participate pursuant to 10 CFR §2.715(c). Consolidated Edison Company of New York, Inc. (Con Edison) opposed the petition in its responses of November 24 and December 21, 1981 on the grounds that participation of the Attorney General as a representative of an interested

² To avoid confusion the Port Authority and the Power Authority (the Power Authority of the State of New York, Licensee) shall be identified in this proceeding by the appropriate binomial abbreviated designation, *i.e.*, "Port Authority" or "Power Authority" rather than simply "Authority".

³ As commonly used, the phrase "interested state" includes any interested "county, municipality, and/or agencies thereof." 10 CFR §2.715(c).

state is precluded by provisions of New York State law which delegates such responsibility to the New York State Energy Office. The Power Authority did not oppose the petition of the Attorney General in its response dated November 24, 1981, but it stated that it believed that only the State Energy Office was authorized to represent the State of New York in this proceeding.

It has long been the practice in proceedings before the NRC and its predecessor, the AEC, to admit more than one state agency and/or representative, on the grounds that different agencies and representatives of states bring different points of view to proceedings. See *Consolidated Edison Company of New York* (Indian Point Unit No. 2), LBP-73-33, 6 AEC 751 (1973); *Metropolitan Edison Company* (Three Mile Island Nuclear Station, Unit No. 1) (Restart), Memorandum and Order Ruling on Petitions and Setting Special Prehearing Conference (unpublished, September 21, 1979). Our authority to admit interested states as set forth in 10 CFR §2.715(c) says that we shall "afford *representatives* of an interested state . . . and or *agencies* thereof, a reasonable opportunity to participate" (emphasis supplied). Clearly NRC regulations do not limit us to the recognition of a sole state representative. Nor do we think that New York State law can so limit us, particularly where, as here, the Attorney General of the State sees no such bar. Therefore we reject the argument that we should admit only the State Energy Office to this proceeding as a representative of the State of New York. Our responsibility to assure that a complete record is compiled mandates that we hear the views of the several, diverse state representatives and agencies that have petitioned to participate in this proceeding.⁴

We rule that the Attorney General of the State of New York satisfies the requirements of 10 CFR §2.715(c) and admit him to this proceeding as a representative of an interested state.

B. Council of the City of New York

Ten members of the Council of the City of New York (NYC Council) filed a petition on November 6, 1981 to participate in this proceeding as representatives of an interested municipality pursuant to 10 CFR §2.715(c). By amendments to its petition dated December 10, 1981 and February 5, 1982, NYC Council added eighteen additional signatories, making a total that comprises more than a majority of the Council, and it

⁴ The Commission's January 8, 1981, Order (Question No. 7) invites an official position from the Governor of New York State. None of the state officials or agencies to date has been authorized or has attempted to present his position. Unless a state representative or agency comes forth with the Governor's views, we shall solicit them ourselves.

designated Ruth W. Messinger as "coordinator". The NRC Staff in its responses dated November 24 and December 21, 1981, and February 25, 1982 takes the position that the NYC Council has not met the requirements of 10 CFR §2.715(c) because (1) it has failed to show that it is a unit of government and not merely a group of individual representatives, and (2) it has failed to identify a spokesperson. Con Edison, in its November 24 and December 21, 1981 responses, argued that the NYC Council failed to show that it was authorized to represent the City of New York and failed to identify a spokesperson. And in a February 22, 1982 response to the February 5 filing of the NYC Council, Con Edison reiterated its earlier objections and, in addition, argued that the Council's February 5 petition to amend was filed out of time and therefore should be denied. The Power Authority in its response dated November 24 argued that the signatories to the NYC Council petition had failed to show that they were authorized by the Council to represent it in this proceeding and, further, that the interests of the signatories would be adequately represented in this proceeding by the participation of the NY State Assembly, the Attorney General of the State of New York, the Counties of Westchester and Rockland, and the Village of Buchanan. The Power Authority also asked, in the February 22 response, that NYC Council's late petition to amend be denied as untimely. Finally, in a response to the objections to its petitions, dated March 12, 1982, the NYC Council argued that it met the technical requirements of 10 CFR §2.715(c), and that if it had not met the technical requirements, this Board should admit it on discretionary grounds.

To begin with, we reject the Licensees' request that we deny NYC Council's February 5 petition to amend because it was untimely. We do so on the basis of NYC Council's argument with respect to the six factors which must be considered for discretionary standing. Four of those six factors are identical to factors set forth in 10 CFR §2.714(a)(1) for considering late petitions to intervene; indeed, the factors for untimely filings were the genesis of those for discretionary intervention. *Portland General Electric Company* (Pebble Springs Nuclear Plant, Units 1 and 2), CLI-76-27, 4 NRC 610, 616 (1976). We find the Power Authority's argument that other governmental agencies will adequately represent the interests of the constituents of the NYC Council to be unpersuasive. As NYC Council points out, it is more likely to represent the interests of New York City citizens in this proceeding than any other petitioner. Moreover, there is no other forum wherein the interests of the citizens of New York City will be protected in this matter. We believe that the NYC Council will be more familiar than other petitioners with problems that might develop in New York City in the event of an emergency with an accident

at Indian Point; therefore the Council's participation can reasonably be expected to assist in developing a sound record. Finally, admission of the February 5 amendment will not delay the proceeding; it may broaden it somewhat, but if so, the broadening will be justified. We find these factors to outweigh the fact that NYC Council failed to show good cause for the late filing.

Having accepted the late-filed amendment to the petition, we must address Staff's objections. Is a petition from a majority of the Council tantamount to an authorization by the Council to participate in this proceeding? We believe it is. We fail to see any substantive reason to deny NYC Council admission on the grounds that a majority of its members signed the petition rather than voted for the same items in a resolution.

Can Ruth Messenger be considered to be NYC Council's spokesperson? We believes she can be. Although it does mystify us, in view of the insistence of Staff and Licensees on this point, that the NYC Council has not claimed that Ms. Messenger will act as its "spokesperson" in just those words, we think that its filings show that she is in fact functioning as the Council's representative. In the December 10, 1981 petition to amend, Ms. Messenger states, "I have been authorized by my colleagues to submit this petition for leave to amend and to coordinate their participation in the the (sic) proceeding. I hereby request that service of all documents be made to me." The first sentence in the foregoing quote was repeated above Ms. Messenger's signature in NYC Council's February 5, 1982 filing. Were this a more leisurely paced proceeding we might be more inclined to be sympathetic with Staff's insistence that technical details of procedure be adhered to, and we might take the time to explore the basis for NYC Council's apparent reticence to give Ms. Messenger formal authorization to be its representative. But we do not have the time to indulge in minor legal technicalities, and we believe the proximity of the Indian Point plants to New York City mandates the participation of the NYC Council.

We rule that the NYC Council has adequately met the requirements for admission pursuant to 10 CFR §2.715(c), and we so admit it to this proceeding. Further, we recognize Ms. Messenger as its spokesperson.

C. County of Rockland

The County of Rockland (Rockland), through the County Attorney, Marc L. Parris, petitioned on November 6, 1981, to intervene in this proceeding pursuant to 10 CFR §2.714, but later, on December 1, 1981, amended its petition and requested to participate as an interested county pursuant to Section 2.715(c). The NRC Staff, in its November 24, 1981 response, stated that Rockland had met both the standing and aspect requirements of 10 CFR §2.714 and should be admitted to intervenor

status, but following Rockland's amendment Staff said it did not object to the changed request. The Power Authority, in its November 24, 1981 response, stated that it did not oppose Rockland's petition. Con Edison, on the other hand, opposed Rockland's petition in its responses dated November 24 and December 21, 1981 on the grounds that the County had not shown that Mr. Parris was authorized to represent it. A resolution attached to Rockland's amendment and characterized in the Rockland filing as "the authorization of the Legislature of Rockland County, directing the Rockland County Attorney to appear in this proceeding" was rejected by Con Edison because "[t]here is no documentation supporting any action taken by the Rockland County Legislature".

We can see no reason to doubt the integrity of the County attorneys for Rockland County. We find that the County Attorney has adequately shown that he has been duly authorized to represent the County of Rockland in this proceeding, and we admit the County to participate as an interested county pursuant to 10 CFR §2.715(c).

D. County of Westchester

Alfred B. DelBello, Executive of the County of Westchester (County), filed a petition on November 6, 1981 to participate in this proceeding as a representative of an interested county pursuant to 10 CFR §2.715(c). In an amendment to its petition filed December 10, 1981, the County cited the authority by which Mr. DelBello is authorized to represent the County. The NRC Staff, in a response dated December 21, 1981, supported the County's petition and recommended that Mr. DelBello be admitted as its representative pursuant to 10 CFR §2.715(c). The Power Authority stated, in its response dated November 24, 1981, that it did not oppose the participation of Mr. DelBello as the representative of the County of Westchester. Con Edison, on the other hand, opposed the petition in filings dated November 24 and December 21, 1981, on the grounds that Mr. DelBello had not shown that he had been authorized to represent the County by the County's Board of Legislators and therefore should not be allowed to participate pursuant to 10 CFR §2.715(c).

We rule that Mr. DelBello has made an adequate showing that he is authorized to represent the County of Westchester in this proceeding, and admit him as the County's representative pursuant to 10 CFR §2.715(c).

E. Metropolitan Transportation Authority

The Metropolitan Transportation Authority (MTA) petitioned on November 4, 1981 to participate in this proceeding as an agency of an interested state pursuant to 10 CFR §2.715(c). It also requested to be allowed to move to intervene under Section 2.714 at some later time,

should its interest so require. The NRC Staff in its November 24, 1981 response supported MTA's petition to participate as an agency of an interested state but objected to MTA's request to reserve the right to move for full party status later, on the grounds that the request is inconsistent with the requirements of 10 CFR §2.714. Staff pointed out that any later petition must address the requirements set forth in 10 CFR §2.714(a)(1), factors (i) - (v). The Power Authority did not oppose the MTA's petition, but Con Edison stated in its November 24, 1981 response that MTA should be required to indicate the subject matter with respect to which it wished to participate. UCS/NYPIRG, responding to MTA's petition on November 13, 1981, also objected to the request for leave to come in later under 10 CFR §2.714 and said that MTA should be required to indicate the subject matter on which it wished to participate.

While 10 CFR §2.715(c) indicates that a Board may require a representative or agency of an interested state to indicate "in advance of the hearing" the subject matter on which it wishes to participate, such a showing is not required for admission pursuant to that section. We see no need to require additional information from MTA about its interests at this time. With regard to MTA's request to reserve the right to intervene later under Section 2.714, however, Staff and UCS/NYPIRG are quite correct. We rule, therefore, that MTA has met the requirements to participate pursuant to 10 CFR §2.715(c) and is so admitted, but its request to reserve the right to come in later with full party status is denied. Such denial is without prejudice to the MTA's late filing of a petition intended to conform to the requirements for late-filed petitions.

F. New York Assembly and Its Special Committee on Nuclear Power Safety

The New York State Assembly and its Special Committee on Nuclear Power Safety (State Assembly) filed a petition to participate in this proceeding pursuant to 10 CFR §2.715(c) on October 4, 1981 and submitted an amended petition on December 8, 1981. The NRC Staff, in responses filed November 24 and December 18, 1981, supported the petition of the State Assembly. The Power Authority stated in its November 24, 1981 response that it did not oppose the petition. Con Edison, on the other hand, objected to the State Assembly's request to participate as an agency of the state on the grounds that New York State law authorizes only the State Energy Office to participate in this matter.

We reject Con Edison's argument for the reasons set forth, *supra*, in our discussion of the petition of the Attorney General. We rule that the State Assembly meets the requirements for participation pursuant to 10 CFR §2.715(c) and so admit it.

G. New York State Energy Office

The New York State Energy Office (Energy Office) through its General Counsel, Stanley B. Klimberg, on November 6, 1981 petitioned to participate in this proceeding as an agency of an interested state pursuant to 10 CFR §2.715(c). The Energy Office showed in its petition that it was authorized by State law to participate "on behalf of the State of New York and its interested agencies".⁵ The NRC Staff, Con Edison, and the Power Authority supported the petition of the Energy Office in responses dated November 24, 1981.

We rule that the New York State Energy Office has shown that it is authorized to participate in this proceeding pursuant to Section 2.715(c), and we admit it as an agency of an interested state.

H. Port Authority of New York and New Jersey

The Port Authority of New York and New Jersey (Port Authority), in filings dated October 14 and December 1, 1981, has petitioned to participate as an agency of an interested state pursuant to 10 CFR §2.715(c) and also for leave to move at a later time for formal status under Section 2.714 if its interest so requires. In its pleadings the Port Authority showed that it is a bi-state agency appropriately authorized to participate in this proceeding pursuant to 10 CFR §2.715(c). The NRC Staff, in its November 24, 1981 response, supported the Port Authority's petition to participate as an agency of an interested state, but pointed out that a later request to intervene pursuant to 10 CFR §2.714 would constitute an out-of-time filing. Con Edison, in its answer to amended petitions on December 21, 1981, and the Power Authority, in its response to petition on November 24, 1981, both supported the Port Authority's petition to participate as an agency of an interested state.

We rule that the Port Authority of New York and New Jersey has met the requirements to participate in this proceeding pursuant to 10 CFR §2.715(c) and is so admitted, but its request to reserve the right to move for full party status later is denied. Such denial is without prejudice to the

⁵ In a letter to the Board dated November 17, 1981, Howard A. Fromer, Assistant Counsel to the Energy Office, objected because the Board's Memorandum and Order of November 13, 1981 characterized the New York Attorney General as appearing "on behalf of New York State". The Energy Office argued that it should be "noted as appearing on behalf of the State of New York and its agencies" by virtue of its statutory responsibility. In response to that letter, the Office of the Attorney General said, in a letter dated November 23, 1981, that it made no claim to be the sole representative of the State of New York. We are herein designating the Attorney General as a representative of the State of New York and the Energy Office as an agency of the State of New York. See our discussion of the petition of the Attorney General of the State of New York.

Port Authority's late filing of a petition intended to conform to the requirements for late-filed petitions.

I. Village of Buchanan

The Village of Buchanan (Village), within the corporate boundaries of which Indian Point Units 2 and 3 are located, requested to participate in this proceeding pursuant to 10 CFR §2.715(c) through its Mayor, George V. Begany, in a petition filed November 6 and a supplement thereto filed December 8, 1981. Neither the NRC Staff nor the Licensees opposed the Village's petition.

We rule that the Village of Buchanan meets the requirements of 10 CFR §2.715(c) for participation in this proceeding and admit it as an interested municipality.

III. PETITIONS TO INTERVENE PURSUANT TO 10 CFR §2.714

A. The Honorable Richard L. Brodsky

By an untimely filed petition of December 2, 1981, the Honorable Richard L. Brodsky, member of the Legislature of Westchester County, seeks to intervene on behalf of himself and two other named persons under 10 CFR §2.714, and to participate in this proceeding as a representative of an interested municipality (the County) under 10 CFR §2.715(c). Staff answered the petition in its filing of December 22, 1981; the Power Authority answered in its filing of December 21, 1981; Con Edison answered in its filing of December 21, 1981.

PASNY opposes Mr. Brodsky's admission in any manner beyond limited appearance, asserting that he has not made a proper showing that he qualifies under Section 2.715(c); that he has made no showing that he will contribute (hence discretionary intervention is inappropriate); that he may not properly represent third parties; and that he should not be admitted because he opposes the Indian Point plants' operation and opposes nuclear power. (See fn. 7). Con Edison would admit Mr. Brodsky only under 2.714, and then only upon a more convincing showing by him that the balance of the five factors for late filing (Section 2.714(a)(1)) weighs in his favor. The Staff would admit Mr. Brodsky under Section 2.714. The Staff analyzes Mr. Brodsky's status with respect to the five factors governing untimely petitions and finds that, while the balance is scarcely compelling, the notion that Mr. Brodsky's participation will not delay matters (the fifth factor) tips the scale.

In a subsequent filing on January 22, 1982, Mr. Brodsky responded to the answers to his petition. In that document Mr. Brodsky does not further address the five factors of CFR §2.714(a)(1). He does, however, at pages

three and four, allege that he "has sought and received expert opinions, [and] . . . developed and filed legislation . . ." concerning the energy, economic, environmental and other consequences of an accident at Indian Point.

We have carefully considered the filings in this case. We do not believe that Mr. Brodsky should be admitted under 10 CFR §2.715(c). While he may represent (as he avers) 60,000 people in the County Legislature, it appears to us that he was elected by them *solely* to represent them in that body. The notion that he has become, by virtue of his election, their representative in any administrative proceeding he sees fit to enter strikes us as unfounded. Nor has he given us reason to believe he represents the County itself or an agency thereof. Mr. DelBello, whose petition is treated above, has, in contrast, done just that.

Mr. Brodsky also now alleges that he represents three individuals and alleges that their affidavits "are forthcoming." We do not read 10 CFR §2.713(b) to permit representation of individuals by a person who is not an attorney, except to the extent such person is a representative of a "partnership, corporation, or unincorporated association." *Accord, Detroit Edison Company* (Enrico Fermi Atomic Power Plant, Unit 2) LBP-78-11, 7 NRC 381, 387, *aff'd*, ALAB-470, 7 NRC 473 (1978).

We can therefore allow Mr. Brodsky to appear only in his own behalf as an intervenor under 10 CFR §2.714. In that regard we agree with the Staff that he appears to have marginally fulfilled the requirements for late filing. We note that his contentions are, verbatim, those of UCS/NYPIRG, a party admitted herein, but we note also, as stated above, that he claims special familiarity and access to special expertise on at least one issue among the many. Convinced as we are that we must seek all avenues of useful information while eschewing insofar as possible any avoidable delay, we have decided to admit Mr. Brodsky as a *pro se* intervenor under 10 CFR §2.714, and to consolidate his intervention with that of UCS/NYPIRG. The conditions of that consolidation are as follows:

1. UCS/NYPIRG will be the lead intervenor for any contention admitted.
2. Only the lead intervenor will introduce evidence or cross-examine witnesses *except* if Mr. Brodsky can show that he offered evidence to UCS/NYPRIG, who then refused to use it, or he proposed questions on cross-examination which UCS/NYPIRG refused to ask, *and* that such evidence or cross-examination will be of substantial help to the Board in its investigation.

Friends of the Earth (FOE)

By petition of November 4, 1981, Friends of the Earth (FOE) petitioned to intervene on behalf of six named persons, all alleged to be members of FOE.⁶ December 2, 1981, FOE submitted, in cooperation with the New York City Audubon Society (Audubon), two contentions. FOE thereafter submitted an affidavit of Lorna Salzman and amendment to the petition, dated December 3, 1981, a reply to PASNY's responses to the petition dated December 3, 1981, a response to the Staff's response to FOE's amendment dated December 21, 1981, and a response to Staff's response to FOE's contentions, dated January 7, 1982. Fundamentally, as to standing FOE takes the position that its affidavit of Salzman, stating as it does that:

The undersigned . . . hereby attests that she has been duly authorized by her organization [FOE] to act as its representative .

and

. . . the members listed in the original petition to intervene have officially authorized FOE, through personal verbal communication, to represent them . . .

establishes the necessary double nexus member-to-FOE and FOE-to-representative which the Board mentioned at pages 46-50 of the transcript.

Staff submitted a reply to the petition (November 24, 1981), a response to the amendment and affidavit (December 15, 1981), an analysis of petitioners' contentions (December 31, 1981), and a final reply to petitioners' answers (February 11, 1982). Succinctly put, the Staff does not believe a proper nexus has been established nor does the Staff believe that either of the two contentions offered is litigable here in its present form. However, Staff agrees that that portion of Contention I which reads:

Present emergency planning is inadequate to mitigate these health effects, and there are no interim or future protective measures which could feasibly protect the health of the public is arguably a matter which bears upon the answer to Commission Question 4:

What improvements in the level of emergency planning can be expected in the near future, and are there other specific offsite

⁶ The petition refers to these people as "sponsors or members" and later as "members." For the reasons set forth in the discussion of indices of membership in connection with UCS/NYPIRG, *infra*, we make no distinction here.

emergency procedures that are feasible and should be taken to protect the public?

Con Edison, in filings dated November 24, December 21, and December 31, 1981, and February 11, 1982, argues that FOE (and, indeed, all the citizens groups petitions) lack standing by virtue of having failed to establish a nexus to individuals with interest and that their alleged members lack the "indicia of membership" as required by *Health Research Group v. Kennedy*, *supra*. Con Edison objects to both contentions on grounds of lack of site-specificity and lack of connection to the Commission's questions.

The Power Authority filed documents related to this petition on November 24, December 21, December 31, 1981 and February 11, 1982. The Power Authority has, among other things, moved (in its December 21 filing) to strike FOE's affidavit of Salzman and amended petition on the ground that they were not served upon the Power Authority. Indeed, they apparently were not. We cannot stress strongly enough that participants in this proceeding *must* serve their filings on all other participants. We have deliberately specified a curtailed service list in order to reduce the burden of distribution on participants, and failure to serve all parties is a serious abuse of our procedures. Nevertheless, we are loathe to impose a sanction as strong as striking a submittal which we need in order to make an interlocutory decision. To do so would, in some measure, be to defeat our own purposes. The Power Authority's motion is therefore denied. We caution FOE, however, to serve all papers properly in the future.

The Power Authority objects to FOE's participation on grounds of lack of standing, also citing *Health Research Group v. Kennedy*. The Power Authority further objects to both contentions as lacking specificity and failing to conform to the Commission's ground rules as set forth in this proceeding.

After due consideration we rule as follows: with respect to standing it seems to us that the Salzman affidavit goes very far toward providing the nexus between persons living in the vicinity and Ms. Salzman's representation of them by virtue of FOE's interest. Even were that nexus deemed tenuous, however, we are mindful of the Appeal Board's teaching in *Duke Power Company* (Amendment to Materials License SNM-1773 - Transportation of Spent Fuel From Oconee Nuclear Station for Storage at McGuire Nuclear Station), ALAB-528, 9 NRC 146, 151, (1979) that:

In our view it was enough for standing purposes that the petition had been signed by a ranking official of the organization who himself had the requisite personal interest to support an intervention petition.

Clearly, Ms. Salzman (who signed the original petition) has the requisite personal interest; her address on every service list is in New York City. Clearly also, she represents herself under oath as an official of the organization: its "Mid-Atlantic Representative." Whether in such capacity she is a "ranking official" in the sense above seems to us too thin a hair to split. We find that the requisite standing has been established. We further discern at least the bare bones of an admissible contention in the assertion that there are, in effect, *no* improvements in the level of emergency which are feasible.

FOE is admitted as an intervenor pursuant to 10 CFR §2.714. As noted below, FOE will be consolidated with Audubon because of their identical contentions. We tentatively designate FOE as lead intervenor to assume a role similar to that of UCS/NYPIRG in the consolidation of UCS/NYPIRG with Richard L. Brodsky (q.v.). But we note that, if either FOE or Audubon believes it can show good reason why Audubon should be lead intervenor for the purpose of dealing with a specific contention we will consider redesignation at the time of submission of cross-examination plans.

C. Greater New York Council on Energy

The Greater New York Council on Energy (GNYCE) submitted a timely petition to intervene on November 6, 1981. Thereafter GNYCE submitted amending and supporting documents on December 2, December 9, and December 10, 1981, and January 15, 1982. The latter included two contentions (in the December 2 filing) and affidavits of authorization from a member from an officer of GNYCE (December 10 filing).

Con Edison in its filings of November 24, 1981, and December 21, 1981, objects to GNYCE's standing, questioning the exact nature of the named members' interest and the governance structure of GNYCE. Con Edison, in its filing of December 31, 1981, appears to discern the shadow of an admissible contention in two sentences of GNYCE's first contention, but in a subsequent filing (February 11, 1982), Con Edison opines that no real substance has been added to the shadow.

The Power Authority, in filings dated November 24, 1981, December 21, 1981, December 31, 1981, and February 11, 1982, faults the propriety of GNYCE's chain from member to representative (doubting even whether GNYCE's member is a member). The Power Authority further argues that GNYCE's proposed contentions, even after explication, are outside the scope of the Commission's questions and lacking in specificity and basis.

The Staff, in filings dated November 24, December 21, and December 31, 1981, and February 11, 1982, finds the links from resident member to GNYCE representative substantial enough to support standing. But Staff,

too, believes the contentions to be unrelated to the Commission's questions (or at least unrelated to those questions with which GNYCE would identify them).

We believe GNYCE has clearly shown standing. As to having a litigable contention we believe, with Con Edison, that the ghost of one flickers in the first and last sentences of Contention I. We would accordingly accept GNYCE's offer, made at p. 4 of its January 15 submission, to elaborate further if so requested.

Accordingly, we conditionally admit GNYCE under 10 CFR §2.714. The admission is conditional upon GNYCE's submission of a basis for greater specificity in relation to the following contention:

Viable alternative strategies exist to incurring the excess fuel costs associated with early and permanent shutdown of Indian Point. The failure of State agencies or the utilities to implement such strategies cannot be held to imply that such strategies are not viable, would not save or produce sufficient energy, or that such strategies would not limit or eliminate excess fuel costs.

The basis so provided shall clearly show how resolving this contention could said in answering Commission Question 6. The alternative strategies suggested shall be such that they could reasonably be adoptable within three to five years following a shutdown. The material shall be submitted by April 12, 1982.

D. New York City Audubon Society

By a petition dated November 6, 1981, the New York Audubon Society (Audubon) sought leave to intervene in this proceeding. The petition is supported by two contentions, filed jointly with FOE, above, on December 4, 1981, and by affidavits of Albert F. Appleton and Asher Fried submitted December 9 and December 12, 1981 respectively.

Con Edison in filings dated November 24, 1981, December 21, and December 31, 1981, and February 11, 1982, objects for the same reasons it objected to FOE's participation, citing *Health Research Group v. Kennedy, supra*, for denial of standing and, of course, objecting to the joint FOE/Audubon contentions as above.

The Power Authority likewise, in filings dated November 24 and December 21 and December 31, 1981 and February 11, 1982, would deny Audubon participation on similar grounds to those on which it objected to admitting FOE. Staff filed documents concerning Audubon on November 24, 1981, December 31, 1981, January 5, 1982, and February 11, 1982. Staff agrees that Audubon has shown standing. However, as with FOE (whose contentions Audubon shares) Staff does not clearly discern an

admissible contention, noting only that part of Contention I may be admissible, as above.

We see a clear nexus to standing in the affidavits supplied. Both affiants attest to membership in Audubon and assert a desire to have interests represented by Audubon. Both attest that they participated in a unanimous resolution to authorize Geoffrey Cobb Ryan to represent Audubon in this proceeding. Clearly both, who say they are members of the Board of Directors of Audubon, give the requisite indices of membership. Both reside within fifty miles of Indian Point. We need not reach the question of whether Mr. Ryan, as a Director of Audubon, who signed the original petition and lists an address in New York, would *per se* qualify Audubon under the *Oconee-McGuire* rule mentioned above. We find Audubon has standing.

As with FOE, we see an admissible contention. We will admit Audubon under 10 CFR §2.714, consolidating it with FOE as noted above.

E. Parents Concerned About Indian Point

Parents concerned About Indian Point (Parents), a voluntary unincorporated association of residents in the area around Indian Point, petitioned to intervene pursuant to 10 CFR §2.714 in an initial filing on November 5, 1981, an amendment filed December 10, 1981, and by contentions filed on December 2, 1981. Parents avers that all its member live within 50 miles of the Indian Point plants, more than half of them live within 10 miles of the plants, shows that it is authorized to represent two members who live at Croton-on-Hudson, and identifies a Special Committee authorized to represent it in this proceeding. Its contentions address the effect of an accident at Indian Point on children within and outside the 10-mile EPZ, and allege that the Emergency Response Plan is inadequate with respect to its provisions for protecting children.

The NRC Staff, in its responses dated December 21 and 31, 1981, and February 11, 1982, states that Parents has met the interest and aspect requirements of 10 CFR §2.714 and has set forth at least one acceptable contention (Contention I, bases 2-8, 13-17, 19, and 21). Con Edison in responses dated December 21 and 31, 1981, states that Parents had satisfied the interest requirement but had failed to set forth an acceptable contention. The Power Authority in responses dated November 24, 1981, December 21, 1981, and February 11, 1982, objects to the admission of

Parents because Parents did not show the requisite interest and does not propose an acceptable contention.⁷

We agree with Staff's overall assessment. We rule that Parents has established standing and has set forth at least one cognizable contention. (Contention I, subject to subsequent limitation by the Board). Parents is admitted to intervenor status.

F. Rockland Citizens for Safe Energy

Rockland Citizens for Safe Energy (RCSE), civic organization located in New City, petitioned to intervene pursuant to 10 CFR §2.714 in an initial filing on November 6, 1981, a supplement containing contentions filed December 1, 1981, and an amendment on December 9, 1981. In these documents RCSE avers that it has about 50 member-families living in Rockland County, many of whom live within the 10-mile EPZ for Indian Point; it is duly authorized by two members (one of whom lives in New City and one in Stony Point) to represent their interests in this proceeding; and RCSE identifies a person authorized to represent it in this proceeding. RCSE sets forth a number of contentions dealing with the Emergency Response Plan for Indian Point.

The NRC Staff in responses dated December 28 and 31, 1981, states that RCSE satisfies the requirements for standing and has submitted several acceptable contentions. Con Edison, in its responses dated November 11, 1981, and December 21 and 31, 1981, agrees that one of the contentions is acceptable but argues that the affidavits "fail to state what interests of these named individuals will be affected by this proceeding." The Power Authority in responses dated November 24, 1981, and December 21, 1981, argues against admitting RCSE on the grounds that "mere recitation of membership is insufficient," that RCSE lacks "an interest specific to itself," and it has not shown that it will contribute positively to this proceeding.

We agree with Staff. We rule that RCSE has shown that it is authorized to represent the interests of two of its members, one of whom lives at New City and the other at Stony Point, communities in close proximity to the plant. It has also identified an authorized spokesperson and has

⁷ With respect to Parents, as well as several other petitioners, the Power Authority argues at great length that the organization's opposition to the use of nuclear power precludes it from the right to participate in this proceeding. The Power Authority is wrong. The fact that "the sole or primary purpose of the petitioner organization [is] to oppose nuclear power in general or the facility at bar in particular" is not a basis for denying a petition to intervene. See *Houston Lighting and Power Company* (Allens Creek Nuclear Generating Station, Unit 1), ALAB-535, 9 NRC 377, 396-397 (1979).

submitted at least one cognizable contention (Contention 5). RCSE is admitted to intervenor status.

G. Union of Concerned Scientists and New York Public Interest Research Group, Inc.

The Union of Concerned Scientists and New York Public Interest Research Group, Inc. (UCS/NYPIRG), filed a joint petition to intervene on November 6, 1981, contentions on December 2, amendments to the petition on December 8 and 10, 1981, and a response to objections to contentions on January 29, 1982. In those documents UCS is identified as a nonprofit coalition of scientists, engineers, and other professionals, supported by 95,000 UCS Sponsors nationwide. It has "spent a decade conducting research into nuclear power safety questions." UCS submitted an unsigned affidavit of one of its sponsors, a resident of Croton-on-Hudson, who represented that the Indian Point reactors threatened her health and safety and authorized UCS to represent her interests in this proceeding. NYPIRG was identified as a not-for-profit, non-partisan research and advocacy organization which has been conducting research for the past year and a half on problems relating to emergency planning in the area surrounding Indian Point. NYPIRG provided the affidavit of a member who lives approximately 40 miles from the plants; the member alleged that her health and safety were threatened by the Indian Point plants, and she authorized NYPIRG to represent her interests. Both UCS and NYPIRG identified the spokespersons authorized to represent them in this proceeding.

The NRC Staff responded to the pleadings of UCS/NYPIRG in its filings dated November 24 and December 21 and 31, 1981, and February 11, 1982. Staff states that NYPIRG has established judicial standing and has proposed a number of acceptable contentions relating to emergency planning and to the risks posed by a serious accident at Indian Point. Staff therefore recommends that NYPIRG be admitted to intervene. With regard to UCS, staff argues that judicial standing has not been established. Staff does not believe that the authorization of a sponsor (assuming that a valid affidavit had accompanied the UCS amendment) provides the "indicia of membership" that is required here. In taking this position Staff relies upon a District Court decision in *Health Research Group. v. Kennedy*, 82 F.R.D. 21 (D.C. 1979). In the absence of standing for UCS, Staff recommends that UCS be granted discretionary intervention because of "the important role played by UCS in the initiation of this proceeding and the likelihood that UCS can make a meaningful contribution due to its asserted expertise . . .".

Con Edison, in its filings dated December 21 and 31, 1981, agreed with Staff that NYPIRG should be admitted to intervene. This Licensee also concurred in Staff's assessment with regard to UCS's petition, relying on *Health Research Group v Kennedy, supra*, as authority for rejecting organizational representation of a sponsor. Con Edison did not recommend that UCS be granted discretionary intervention, however. The Power Authority, in its November 24 and December 21, 1981 responses, opposed the admission of both NYPIRG and UCS, on the grounds that the organizations are opposed to nuclear power in general, have not shown that they have an interest that will be affected, and will contribute to this proceeding.

With regard to the "indicia of membership" problem raised by Staff, we do not find that *Health Research Group v. Kennedy, supra*, requires the conclusion reached by Staff and Licensees. There, the plaintiffs were an umbrella public interest group and one of its subsidiaries. The subsidiary group received no direct financial support from the public, and its parent organization was so broadly based that its contributors could not be assumed to have any knowledge of, or specific interest in, the issues sought to be litigated by the sub-unit. Here, the organizational objectives of UCS in regard to nuclear power are clearly defined and well advertised; there can be little doubt that it is a desire to support the pursuit of those goals that motivates the financial participation of the UCS Sponsors. The primary purpose of UCS in this case is to oppose the continued operation of the Indian Point plants; it was their petition to the Commission to shut down the plants that initiated this proceeding. That opposition and the steps taken to effectuate it are clearly germane to the organization's expressed purposes. We can safely assume that the UCS Sponsors who live in the vicinity of Indian Point are aware of these interests and activities of UCS.

This consideration leads us to the teachings of the Appeal Board in *Houston Lighting and Power Company* (Allens Creek Nuclear Generating Station, Unit 1), ALAB-535, 9 NRC 377, (1979) with regard to the authorization issue of organizational representation. The Appeal Board ruled that there need *not* be a specific representational authorization of a member with personal standing in the case of all organizations. It said:

To the contrary, in some instances the authorization might be presumed. For example, such a presumption could well be appropriate where it appeared that the sole or primary purpose of the petitioner organization was to oppose nuclear power in general or the facility at bar in particular. In such a situation, it might be reasonably inferred that by joining the organization, the members

were implicitly authorizing it to represent any personal interests which might be affected by the proceeding. (footnote omitted)

9 NRC at 396.

Further, the Appeal Board explicitly applied this teaching to UCS in *Virginia Electric and Power Company* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-536, 9 NRC 402, (1979). As Staff pointed out the Appeal Board there found that UCS had not established standing to intervene, but went on to say:

In this connection, we have attached no significance to the fact that the persons specifically identified in the UCS petition were described as "donor" members of the organization (in our judgment there is no necessity here to explore the question whether representational standing can be based on the personal interests of a mere financial contributor to the organization). Further, we *reject the argument of the applicant and the staff that UCS was required to produce a specific authorization to represent the interests of at least one of its members shown to possess personal standing. To be sure, such an authorization is normally an ingredient of a demonstration of representational standing. But the authorization may be presumed in the case of members of organizations such as UCS.* (citation omitted; emphasis supplied)⁸

9 NRC at 404 fn. 2.

It is clear to us that UCS need not produce an affidavit from one of its members (or sponsors). UCS may be presumed to represent their interests in this matter. Thus the fact that we have not been provided with an executed affidavit is of no consequence.

UCS provided the names and addresses of five of its sponsors in the November 6, 1981, petition of UCS/NYPIRG. All of them live within 25 miles of Indian Point, and affiant Robert D. Pollard attested that he had personally spoken with each of them and they had specifically authorized UCS to represent them. The fact that UCS has sponsors living within 25 miles of the plant is enough to give it standing, provided those sponsors may be regarded in this instance as equivalent to members.

Since the Appeal Board has not reached the matter of standing of "donor" members of organizations, we shall decide the issue as it relates to

⁸ The inclusion by Staff in its December 21, 1981, filing at p. 8, fn. 5, of the parenthetical statement from this quotation, rather than the entire statement, unaccompanied by any discussion to show the clear intent of the Appeal Board, was, in our view, less than candid. We call to the attention of Staff, and all parties, the teaching of the Appeal Board in *Black Fox*, where it said, "Counsel appearing before this Board (as well as other NRC adjudicatory tribunals) have a manifest and iron-clad obligation of candor." *Public Service Company of Oklahoma, et al.*, (Black Fox Station, Units 1 and 2), ALAB-505, 8 NRC 527, 532 (1978).

this proceeding. First we note, as Staff pointed out, that the Licensing Board in *Three Mile Island - Restart* admitted UCS to that proceeding on the basis of UCS Sponsors who lived within 20 miles of the plant. *Metropolitan Edison Company, et al.*, supra. We agree with that determination. In our view, where an individual UCS Sponsor has standing, this provides sufficient nexus between the organization and this proceeding so as to permit representational standing by UCS. Where, as here, a non-membership organization has a well-defined purpose which is germane to the proceedings, sponsors can be considered equivalent to members where they financially support the organization's objectives and have indicated a desire to be represented by the organization.⁹

We rule that UCS and NYPIRG have both established judicial standing and have proposed at least one acceptable contention (Contention I(A)).¹⁰ We admit UCS/NYPIRG to intervenor status and consolidate with it the Honorable Richard L. Brodsky.¹¹

H. West Branch Conservation Association

By timely petition of November 2, 1981, the West Branch Conservation Association (WBCA) seeks to intervene in this proceeding. In response to Staff's and Licensees' positions, WBCA amended that petition on December 2, 1981, supplying affidavits of Melissa Levi, Joan Harding King and Thomas J. King, all as members residing near the plant who wished WBCA to represent them, and an affidavit of Joan Harding King as Recording Secretary of WBCA, attesting that, by vote of its Board of Directors, WBCA seeks to participate herein and names representatives. On January 11, 1982, WBCA filed a further response to comments on its contentions. WBCA's previous filings had no made clear exactly what portions of the statement made were meant as contentions, nor indeed, is

⁹ Though the Court, in *Health Research Group v. Kennedy*, found that the plaintiff organizations lacked standing, it did not dismiss the complaint. Rather, it permitted amendment of the pleadings to substitute other individual plaintiffs deemed to have standing in their own right. In doing so, the Court cited considerations of judicial economy; the original plaintiffs had already extensively briefed the merits of the case. Clearly, the effect of this decision was to permit the public interest groups to continue to pursue the litigation if authorized to do so by the individual plaintiffs (two of whom were supporters and one allegedly a contributor to the parent group).

Here, one or more of the UCS Sponsors could have filed petitions, been substituted as an intervention petitioner, been found to have standing, and then merely authorized UCS to act on their behalf. We decline, however, to approach the resolution of this issue through such a needless paper charade.

¹⁰ Had we not so ruled we would have accepted the recommendation by Staff to admit UCS at our discretion.

¹¹ UCS/NYPIRG is designated lead intervenor. For other details regarding this consolidation, refer to our discussion of Mr. Brodsky's petition, supra.

the January filing very helpful in this respect. We shall assume, however, that it is the January filing to which we should look for the final clarification of WBCA's intended contentions.

Staff answered this petition and the amendments in its filings of November 24, December 11 and 31, 1981, and February 11, 1982. Staff at first advised of the need for amendment to satisfy the requirements of standing, then agreed that the amendments of December 2 cure the flaw. Staff further sees three admissible contentions in WBCA's January filing.

Con Edison in filings of November 24, December 21, and December 31, 1981, and February 11, 1982 opposes admission of WBCA, finding neither proper standing (despite the amending affidavits) nor an admissible contention. The Power Authority takes a very similar position in its filings of November 24, December 21, and December 31, 1981, and February 11, 1982.

We hold that a clear nexus has here been established between named members at risk, WBCA itself, and its named representatives before us. We resolved the issue of standing in WBCA's favor. We further hold that WBCA has presented at least one issue related to the Commission's questions, viz. the assertion of financial benefit accruing to Rockland County through the sale of electricity, a matter which relates to Commission Question 6. We also note that WBCA, in its January 11, 1982, filing, supplies a wealth of information on roads and traffic in the area which could be viewed as comprising a contention on emergency planning. While WBCA offers this material as being ostensibly related to Commission Question 1, we see it as relevant under Question 3. Clearly, WBCA's contentions may require restatement, but nonetheless we rule that the petition, as amended, has met the requirements for at least one litigable contention. WBCA is admitted in accord with 10 CFR §2.714.

I. Westchester People's Action Coalition

Westchester People's Action Coalition (WESPAC) submitted a petition to intervene pursuant to 10 CFR §2.714 on November 5, 1981, contentions on December 1 and a supplement to its petition on December 8, 1981, and responses to objections on January 6 and 14, 1982. These filings show that WESPAC is a not-for-profit organization representing approximately 2000 households in Westchester County, all of which are located within 50 miles of Indian Point. WESPAC submitted the affidavit of its Co-chairperson, Mr. Charles A. Scheiner, showing that he is authorized to represent the organization in this proceeding. In addition it submitted a notice of appearance of attorney Alan Latman, Esq., on its behalf. Both Mr. Scheiner and Mr. Latman, who is also a member of WESPAC, live within

15 miles of the Indian Point plants. WESPAC's contentions address alleged deficiencies in the emergency response plans for Indian Point.

The NRC Staff, in its filings on December 31, 1981, and February 11, 1982, stated that WESPAC has shown that it will be represented by a duly authorized representative and has proposed at least one acceptable (subject to modification) contention, but that it has failed to show that at least one member of WESPAC whose interest might be affected had authorized WESPAC to represent him or her. Con Edison, in its December 21, 1981 filing, also objected to the admission of WESPAC because the organization has failed to submit affidavits from members authorizing it to represent them. The Power Authority, in its December 21, 1981 response, objects to WESPAC's admission on the grounds that WESPAC has not shown that its members have an interest in this proceeding, that it refused to file affidavits from members, and that it has not shown that it can contribute to this proceeding.

In objecting to the admission of WESPAC on the grounds that an affidavit from one of its members had not been submitted to clothe the organization in the personal standing of a member, Staff and Licensee appear to have overlooked, in this instance, the ruling of the Appeal Board in *Duke Power Company, supra*, which we quoted in our discussion of the petition of FOE.¹² That ruling governs here. Mr. Scheiner, Co-chairperson of WESPAC, has the requisite personal interest to support the petition of his organization.

We rule that WESPAC has shown that it has standing to intervene in this proceeding and has proposed at least one cognizable contention (Contention 1, as later limited by the Board). It is admitted to intervenor status.

IV. AGENDA FOR SECOND SPECIAL PREHEARING CONFERENCE

At the Second Special Prehearing Conference scheduled for April 13 and 14, 1982, in White Plains, New York, the Board will consult with the parties concerning: (1) the formulation of the contentions to be litigated in this proceeding, and, (2) the discovery to be conducted thereon. We have carefully considered the Commission's instructions contained in fn. 4 as revised in its September 18, 1981, Order, where it stated as follows:

Because the Commission itself is designating by this Order the issues it wishes to be addressed in the adjudication . . . *it is*

¹² And which Staff quoted on p. 4, fn. 3, in its December 15, 1981, response to the amendment of the petition of FOE.

important that contentions raised by parties and sub-issues raised by the Board in this proceeding contribute materially to answering those designated issues.

. . . [T]he Board will not be bound by the provisions of 10 CFR Part 2 with regard to the admission and formulation of other contentions. In granting this discretion to the Board, the Commission emphasizes that its purpose is to ensure that *the Board is empowered only to accept and formulate, after consultation with the parties, those contentions which seem likely to be important to resolving the Commission's questions on pages 9-10, and thereby to assure that the proceeding remains clearly focused on the issues set forth in this Order.* (emphasis supplied)

We have decided that the most effective and efficient way to comply with the intent of the Commission in this investigation is for the Board itself to formulate the contentions to be litigated, basing our formulation on the contentions submitted in the pleadings, the positions of the parties at the Second Special Prehearing Conference, and on our judgement with regard to issues that we believe need to be ventilated.

Accordingly, by subsequent order of this Board the contentions to be litigated in this proceeding will be set forth. For each contention there will be designated a lead intervenor and, where appropriate, other intervenors who have contributions to make to the litigation of that contention. It will be the responsibility of the lead intervenor to prepare filings, present witnesses, introduce documentary evidence, conduct cross-examination, and submit findings of fact with respect to the contention or contentions assigned to it. Contributing intervenors shall assist the lead intervenor by supplying evidence, suggesting questions and plans for cross-examination, contributing to the findings of fact, and providing any other assistance and cooperation that will aid the lead intervenor in contributing to the development of a complete record in this case. If a lead intervenor declines to introduce any evidence proposed by a contributing intervenor or refuses to accept a contributing intervenor's suggestions with regard to cross-examination or findings of fact, the contributing intervenor may petition the Board to introduce such matters on its own behalf.¹³ The petition must show that the independent introduction of material by the contributing intervenor is essential to the development of a sound record.

At the Second Special Prehearing Conference we will hear argument from the parties and participants with regard to the contentions which we formulate and our designation of lead and contributing intervenors. We

¹³ Such petition can be made orally during the course of the hearing.

shall also propose and hear argument on a discovery schedule and procedures.¹⁴

Upon consideration of all of the foregoing and of the entire record in this matter, it is this 2nd day of April, 1982

ORDERED

1. That pursuant to 10 CFR §2.715(c) the Attorney General of the State of New York, the New York State Energy Office, the County of Westchester, the Metropolitan Transportation Authority, the Council of the City of New York, the Port Authority of New York and New Jersey, the County of Rockland, the New York State Assembly and Its Special Committee on Nuclear Power Safety, and the Village of Buchanan are admitted as participants to this proceeding.

2. That pursuant to 10 CFR §2.714 the Honorable Richard L. Brodsky, Friends of the Earth, the New York City Audubon Society, Parents Concerned About Indian Point, Rockland Citizens for Safe Energy, the Union of Concerned Scientists and New York Public Interest Research Group, the West Branch Conservation Association, and the Westchester Peoples Action Coalition are admitted as intervening parties to this proceeding, subject to such conditions as may have been set forth herein or will set forth subsequently.

3. That the Greater New York Council on Energy is conditionally admitted pursuant to 10 CFR §2.714 pending further order of the Board.

4. That the Parties and Participants shall attend the Second Special Prehearing Conference on April 13 and 14, 1982 at the Ceremonial Courtroom, Westchester County Courthouse, Grove Street, White Plains,

¹⁴ All parties and participants are put on notice that discovery in the proceeding will be abbreviated and must be conducted efficiently. Put simply, the Board cannot and will not tolerate protracted legal battles over discovery. For guidance, see 10 CFR §2.730(h) and Section III, A-D, of the Commission's Statement of Policy on Conduct of Licensing Proceedings (46 FR 28533, May 27, 1981).

New York to discuss the formulation of contentions and the discovery schedule and procedures.

**THE ATOMIC SAFETY AND
LICENSING BOARD**

**Louis J. Carter, Chairman
ADMINISTRATIVE JUDGE**

**Oscar H. Paris
ADMINISTRATIVE JUDGE**

**Frederick J. Shon
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**John F. Wolf, Chairman
Dr. Frank F. Hooper
Gustave A. Linenberger, Jr.**

In the Matter of

**Docket Nos. 50-522
50-523**

**PUGET SOUND POWER & LIGHT
CO., *et al.*
(Skagit/Hanford Nuclear Power
Project, Units 1 and 2)**

April 5, 1982

The Licensing Board rules on petitions to intervene.

RULES OF PRACTICE: STANDING TO INTERVENE

An intervention petitioner, to have standing, must allege some injury that has occurred or will result from the action taken as a result of the proceedings. A mere academic interest in the outcome of the proceedings will not confer standing.

RULES OF PRACTICE: STANDING TO INTERVENE

The economic concerns of ratepayers of the applicant utilities are not within the "zone of interests" protected by the Atomic Energy Act or NEPA, and such interests do not provide a basis for standing for the representative of the affected ratepayers.

MEMORANDUM AND ORDER
IN RESPONSE TO PETITIONS TO INTERVENE FILED BY (1) NATURAL
RESOURCES DEFENSE COUNCIL, (2) NATIONAL WILDLIFE
FEDERATION AND OREGON ENVIRONMENTAL COUNCIL, AND (3)
COALITION FOR SAFE POWER/FORELAWS ON BOARD

Timely petitions for leave to intervene have been filed in these proceedings pursuant to 10 CFR §2.714 by: (1) Natural Resources Defense Council (NRDC); (2) National Wildlife Federation (NWF) and Oregon Environmental Council (OEC) (a joint petition); and (3) Coalition for Safe Power (CSP) and Forelaws on Board (FOB) (a joint petition).

I. NRDC Petition to Intervene

(a) Intervention as of Right

NRDC seeks to intervene in these proceedings to protect its own interests as an entity and the interests of its members. As an organization it and its nationwide membership are dedicated to the defense and preservation of the human environment and the natural resources of the United States.

To have standing in this matter one must satisfy two tests, first, one must allege some injury that has occurred or will result from the action taken as a result of these proceedings. Under this 'injury in fact' test a mere academic interest in the outcome of the proceedings will not confer standing. One must allege an interest arguably within the zone of interest of the Atomic Energy Act and Section 2.714 of NRC's Rules of Practice.¹

The petition lists alleged harm to its member but no harm in fact to NRDC, as an entity. NRDC relies on its claim to be a "special interest" organization with demonstrated concern for environmental and nuclear power matters as its basis for standing. That reliance is misplaced.²

In the Sierra Club case, The Supreme Court said: "a mere interest in a problem no matter how longstanding the interest and no matter how qualified the organization is in evaluating the problem, is not sufficient by itself to render the organization 'adversely affected' or 'aggrieved' within the meaning of APA."

It is clear that under the Sierra Case holding NRDC does not have standing on the basis of its organizational interest.

¹ Portland General Electric Co. (Pebble Springs Nuclear Plant, Units 1 and 2) 4 NRC 610, 613, 614 (1976).

² Sierra Club v. Morton, 405 U.S. 727, 739-40 (1972).

(b) Intervention as a Representative of its Members

NRDC's attempt to show standing through its members interest is not successful for the following reasons.

The affected members interests are predicated on economic concerns as ratepayers of the applicant utilities. It is well established that the interest of ratepayers is not within the "zone of interests" protected by the Atomic Energy Act or NEPA.³

NRDC argues that standing is established by asserting that listed members could be adversely effected by the operation of Skagit/Hanford Nuclear Power Plant. It contends that the operation, if licensed by this proceeding, would cause thermal and chemical pollution in the Columbia River which in turn would increase fish mortality and decrease recreational safety. In addition, it claims its members will incur risks of catastrophic accidents and impacts due to radioactive wastes. The petition fails to allege how NRDC or its member will suffer "injury in fact". The members are customers of utilities in the area but none of them resides within 50 miles of the proposed site.

The Board finds on the basis of the deficiencies indicated above that the NRDC's petition has failed to establish a basis for intervention as of right.

(c) Discretionary Intervention

NRDC has not sought discretionary intervention. However, the factors listed by the Commissioners in the Pebble Springs decision⁴ to be weighed in determining discretionary intervention, have been considered by the Board to the extent possible at this stage of the development of the record. In the light of the allegations in the petition it is concluded that a perceptive determination regarding discretionary intervention cannot be made at this time. Accordingly, discretionary intervention is denied.

II. NWF and OED Joint Petition to Intervene

(a) Intervention as of Right

While the joint petition lists alleged harm to its members it lists no harm to NWF or OEC as entities. NWF/OEC organizational interests in environmental problems and nuclear power do not provide a basis for standing on their own.⁵

³ Portland General Electric Co. (Pebble Springs Nuclear Plant, Units 1 and 2) CLI-76-27, 4 NRC 610, 614 (1976).

⁴ Pebble Springs Case, *supra* 4 NRC 610, 614 (1976).

⁵ Sierra Club v. Morton, *supra* 405 U.S. 727; Pebble Springs, *supra* 4 NRC at 613.

The only members identified in the NWF/OEC petition live in Portland, Oregon, 180 miles from the site. This is beyond the area accepted by NRC to establish that possible injury will occur. Accordingly, no basis for standing can rest on the residences of NWF/OEC members. The petition does not explain how the listed members will suffer injuries to their recreational activities as a result of the proposed construction and operation of the Skagit/Hanford Plant. The identified economic concerns of the members as ratepayers to the applicants are not an acceptable basis for standing. None of the standing, alleged bases in the petition are acceptable as a basis to establish standing as a matter of right.

(b) Discretionary Intervention

NWF/OEC's petition does not seek discretionary intervention. However, the Board has considered the possibility. It has found no basis in the petition that NWF/OEC would make a unique contribution to the record. It does not appear that there are any interests, or special knowledge or expertise with respect to the amended application that would warrant this Board to consider allowing NWF/OEC to intervene on a discretionary basis. In the present circumstances, the Board has concluded that discretionary intervention should not be granted.⁶

III. Petition of CSP/FOB

(a) Intervention as Right

The coalition for safe power (CSP) alleges that it is a not-for-profit citizens organization and that it works for safe energy through research and education. Forelaws on Board (FOB) joined the petition by consolidation. Neither the interests nor membership of FOB have been stated in the petition.

Standing exists here for CSP based on an affidavit of Mr. Terry Dana which states that the affiant resides at Richland, Washington, is a member of CSP, and authorizes CSP to represent his interest in this matter.

Since Richland, Washington is about 15 miles from the proposed site it appears that Mr. Terry Dana could be affected by the results of this proceeding.

The Board finds that CPS has established standing on the basis of the residence of its member Mr. Terry Dana.

FOB has not pleaded its interests or identified effected members in the petition. CSP can assert only its own interests in the proceeding and

⁶ Cf. Pebble Springs, *supra* 4 NRC 610.

cannot intervene on behalf of FOB.⁷ FOB's attempt to consolidate with CSP in this matter is accordingly rejected.

It does not appear from the petition that there are any interests, or unique knowledge or expertise with respect to the amended application that would warrant this Board to consider allowing FOB to intervene on a discretionary basis.

Accordingly, it is
ORDERED

This 5th day of April, 1982, that:

- (1) The NRDC petition to intervene is denied;⁸
- (2) The NWF/OEC petition to intervene is denied;⁸ and
- (3) The CSP petition to intervene is granted.⁹

The FOB petition to intervene is denied.⁸

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

John F. Wolf, Chairman
ADMINISTRATIVE JUDGE

⁷ Tennessee Valley Authority (Watts Bar Nuclear Plant, Units 1 and 2) ALAB-413, 5 NRC 1418, 1421 (1977).

⁸ Under 10 CFR §2.714(a)(3) an amended petition to intervene may be filed, at any time up to fifteen (15) days prior to the holding of the special prehearing conference, to cure any deficiencies in the original petition to intervene if the petitioner is able to do so.

⁹ Under the terms of 10 CFR §2.714(b) a petitioner must file "a supplement to his petition to intervene which must include a list of the contentions which petitioner seeks to have litigated in the matter, and the bases for each contention set forth with reasonable specificity . . . A petitioner who fails to file such a supplement which satisfies the requirements of this paragraph with respect to at least one contention will not be permitted to participate as a party."

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Ivan W. Smith, Chairman
Dr. Walter H. Jordan
Dr. Linda W. Little**

In the Matter of

**Docket No. 50-289
(Restart)**

**METROPOLITAN EDISON
COMPANY
(Three Mile Island Nuclear
Station, Unit No. 1)**

April 5, 1982

Licensing Board, having reserved jurisdiction in Partial Initial Decision LBP-81-59, 14 NRC 1211, December 14, 1981, to consider the Staff's plan for implementing the initial decision, after modification and amendment, adopts the Staff's implementation report.

**RESERVATION OF JURISDICTION: IMPLEMENTATION OF
INITIAL DECISION;
DELEGATION OF AUTHORITY**

Jurisdiction to approve post-decision implementation plan was reserved in view of the fact that the evidentiary record did not permit detailed determination of which considerations require the imposition of rigid license conditions; that the license should not be freighted unnecessarily and too rigidly with license conditions; that enforcement involved its own expertise; that the Notice of Hearing (10 NRC 141, 148-49) assigned responsibility to be shared by the Director of Nuclear Reactor Regulation and by the Board to implement the Board's decision; and that to leave the entire enforcement responsibility to the Staff would be an excessive delegation of the Board's responsibilities.

JURISDICTION: PETITION FOR RECONSIDERATION

An uninvited request to reevaluate the evidentiary record and arrive at a different conclusion made more than two months after the initial decision would, standing alone, be an untimely petition for reconsideration under 10 CFR 2.771 and beyond the Board's jurisdiction.

JURISDICTION: IMPLEMENTATION OF INITIAL DECISION

Having retained jurisdiction to approve implementation plan, even though a request for modification of the initial decision could be deemed an untimely petition for reconsideration, it would be pointless for Licensing Board to require the implementation of a condition it no longer supported, and, in any event, the Board's ruling would afford useful guidance to the Appeal Board and Commission on review.

JURISDICTION: IMPLEMENTATION OF INITIAL DECISION

Having retained jurisdiction to approve implementation plan, a request to clarify the scope and purpose of a Board-imposed condition in the initial decision is not a petition for reconsideration and is properly within the Board's jurisdiction.

MEMORANDUM AND ORDER MODIFYING AND APPROVING NRC STAFF'S PLAN OF IMPLEMENTATION

Background and Summary of Rulings

In the Partial Initial Decision of December 14, 1981 (LBP-81-59, 14 NRC 1211) the Board explained that, throughout the decision on plant design and unit separation issues, references were made to the Board's reliance on various Staff "requirements", Licensee "commitments" and Board-imposed "conditions" without studied regard to whether these terms were intended to be conditions or legally-binding technical specifications attached to the TMI-1 license. PID ¶¶ 1198-1202.

We explained further that the evidentiary record did not lend itself to detailed determinations as to which of these considerations require the imposition of rigid license conditions and technical specifications (PID ¶ 1213); that the license should not be freighted unnecessarily and too rigidly with license conditions (PID ¶ 1207); that enforcement involves its

own expertise (PID ¶ 1213); that the Notice of Hearing assigned responsibility to be shared by the Director of Nuclear Reactor Regulation and by the Board to implement the Board's decision (PID ¶ 1216); and that to leave the entire enforcement responsibility to the Staff would be an excessive delegation of the Board's responsibilities (PID ¶ 1216).

Therefore we deferred issuing our final decision on which of the various requirements, commitments and Board-imposed conditions should be made license conditions and we directed the Staff to present a plan for the implementation of the Board's decision on plant design and unit separation matters. Licensee was directed to respond to the Staff's report and other parties were invited to respond. PID ¶ 1217. As to the plant design issues, the Board listed nineteen categories of requirements which, at a minimum, the Staff was directed to address. PID ¶ 1218.¹ The Staff was also directed to include four categories of unit separation requirements in its implementation plan report. PID ¶¶ 1236-37.

The Staff, on February 1, 1982, reported the details of its enforcement plan. On February 22 the Licensee replied to the Staff's report challenging some aspects of the enforcement plan. Union of Concerned Scientists (UCS), the only other party to reply to the Staff's report, on February 17, criticized the Board's approach to enforcement, and faulted some aspects of the Staff's plan. The Staff, by leave of the Board, filed on March 10 a response to the Licensee's position in which the Staff reported that it and Licensee now agree in most of the disputed areas.

The Staff's report addressed each of the matters set out in the Board's directive and other implementation items. We find that the implementation plan is generally sufficient but that it requires some modifications and additions. Below, as modified and amended, we adopt the plan as the Board's order in this proceeding.

Discussion

Steam Generator Bypass Logic Problem

In PID ¶ 1064² the Board required that

. . . prior to restart, the Licensee propose for Staff approval, a long-term solution to the steam generator bypass logic problem

¹ One requirement, to complete a revised small-break loss of coolant accident analysis under revised assumptions, was later deleted from the decision by the Board's order of January 26, 1982.

² The NRC Staff incorrectly refers to PID ¶ 1174.

for implementation as soon as possible after restart. Prior to restart, the Staff shall certify to the Commission that the Licensee has made reasonable progress in initiating its program for the long-term solution.

In its enforcement plan (page 3, item 5), the Staff proposes that it will require Licensee to upgrade its main steam rupture detection system to safety grade prior to startup following Cycle 6 refueling. The plan also requires (at page 6, item 10) that prior to restart, the Licensee must propose a means to prevent feedwater isolation due to failure in rupture detection systems.

UCS contends (at page 4) that implementation of the solution after the Cycle 6 refueling does not comport with the Board's order requiring implementation as soon as possible after restart. However the Board is satisfied with the time contemplated by the Staff. On the other hand, UCS is correct in that the Staff has failed to provide for certification to the Commission that, prior to restart, Licensee has demonstrated reasonable progress in initiating the longer-term solution.

Accordingly we reiterate the requirement that the Licensee demonstrate reasonable progress prior to restart. If the Staff is satisfied, upon evaluation, that Licensee's proposal of a means for preventing feedwater isolation due to a failure in the rupture detection system itself constitutes reasonable progress, it may so certify. We will not, however, require, as UCS urges (at page 4), a report to this Board of the substance of the program.

Environmentally Qualified Pathway to Cold Shutdown

In our Partial Initial Decision we presumed that Licensee would environmentally qualify the equipment needed to achieve cold shutdown in accordance with Supplement 3 to IE Bulletin 79-01B. But recognizing some doubt about the validity of that presumption, we required that the Commission be informed if the Licensee does not plan to qualify the equipment. PID ¶ 1180.

In its January 28, 1982 Comments to the Commission on immediate effectiveness, the NRC Staff has complied with this directive by informing the Commission, *inter alia*, that its position as set forth in the IE Bulletin has since changed, and that the Staff is not currently aware of any such plans (Comments at 14, 15) by the Licensee. The Staff's report to the Commission is complete. The Licensee has also disclosed its position to the Commission in its January 28 comments on immediate effectiveness (at page 4). The Board's reporting requirement is satisfied and we are also satisfied with the substance of the Staff and Licensee's respective reports.

The Staff has listed under II C, "COMMITMENTS/ REQUIREMENTS TO BE COMPLETED UNDER RESTART", our requirement flowing from PID ¶ 1180 that the equipment either be environmentally qualified or that the Commission be so informed. Licensee believes, apparently, that there is an opportunity for confusion in this organization in that listing it there might be read to require environmental qualification before restart. This interpretation is not likely, but a better organization would be, as Licensee suggests, under II D, "OTHER COMMITMENTS/ REQUIREMENTS" of the implementation plan.

Systems Interaction Studies

The Board specified in ¶¶ 1000 and 1003(f) that TMI-1 is to be included by the Staff in generic reviews of systems interactions. The Staff reports that it is still formulating and testing methodologies and guidance for the conduct of systems interaction studies and is presently not imposing a requirement to conduct such studies generically. Report, pp. 8, 9. However, in response to recommendations by the ACRS, the Licensee has committed to perform a probabalistic risk assessment for TMI-1. *Id.* The Staff states that it will monitor Licensee's efforts to assure that this assessment is performed in accordance with Staff guidance.

Contrary to UCS' comments (at pp. 5, 6) the Staff has not abandoned the generic studies program as is demonstrated by its report that it is proceeding with the formulation and testing of methodologies and guidance. However, the Board and UCS (*Id.*) were both concerned that the Staff's report means that, contrary to the intent of the Board's order, TMI-1 would not be included in any generic reviews. The Board has since been assured that if the presently underway initial studies of the five other plants indicate that the studies are useful and worthwhile, TMI-1 will be included. Tr. 27,013 (Cutchin). This conforms to the intent of the Board's order.

Control Room Design Review

The Staff originally proposed to include prior to restart the following specific license condition:

Prior to startup following Cycle 6 refueling, the Licensee shall correct the deficiencies in the TMI-1 control room that are identified in Items 3b, 3e, 3g, 4c and 10b of NUREG-0752 and its Supplement 1. (See PID, ¶¶ 913 & 919, n.109.)

Staff Report at 3. Licensee responded (at page 3) that this condition should be modified to eliminate Items 3b, 3e, 3g and 10b, as well as the reference to PID ¶ 919, n.,109.³ Licensee's complaint was that its commitment to address these items in a subsequent submission was translated by the Staff into a requirement for unidentified corrections; that Licensee is being treated differently than other operating reactors, and that there is no basis for the schedule imposed. *Id.* at 3-7.

Subsequent to Licensee's response, Staff and Licensee discussed Licensee's concerns and, by leave of the Board, the Staff reported that both agree that the license condition may be reworded as follows:

The Licensee shall correct the human factors deficiency in TMI-1 control room design that is identified in Item 4c of NUREG-0752 and its Supplement 1 prior to startup following Cycle 6 refueling, and the Licensee shall address final resolution of the human factors design deficiencies that are identified in Items 3b, 3e, 3g and 10b of NUREG-0752 and/or its Supplement 1 in its detailed control room design review (DCRDR) report for TMI-1. (See PID ¶ 913).

Staff Response of March 10, 1982, at 1, 2.

The Board accepts the agreed-upon license condition. We also accept Licensee's recommendation that Item II C.8 under COMMITMENTS/REQUIREMENTS TO BE COMPLETED PRIOR TO RESTART should be modified to include *Supplement 1* to NUREG-0752. Thus the modified condition reads:

"8. Staff will review control room modifications against criteria of NUREG-0752 and its Supplement 1, prior to restart (See PID ¶¶ 913-15)." [Footnote omitted]

Work Suspension During Fuel Handling

The Board required that "[d]uring any Unit 2 fuel movements Licensee will suspend work in the Unit 1 area of the fuel handling building . . ." PID ¶ 1326(a). The Staff proposed the following condition:

During any Unit 2 fuel movements Licensee shall suspend work in the Unit 1 area of the fuel handling building. (See PID, ¶ 1326).

Staff Report at 3, Item II.A.7.

Licensee objected to the license condition proposed by the NRC Staff as "constituting too literal an interpretation of the Board's order". Licensee

³ Items 3b and 3g relate to Bailey controllers. Item 3e relates to detection of burned-out indicator bulbs. Item 10b and PID ¶ 919, n.,109 relate to in-plant communications.

urged, instead, that the license condition not impose an absolute bar to work in the Unit 1 area of the fuel handling building during Unit 2 fuel movements, but rather that NRC Staff review of Unit 2 fuel movement procedures consider on an *ad hoc* basis whether safety considerations require halting work in the Unit 1 area of the fuel handling building. Licensee Response, p. 8.

Licensee's problem rises not from the Staff's interpretation of the Board's order, but from the order itself. The Staff's initial proposal reflected both the language and the intent of our order. The solution proposed by the Licensee would have the Board reexamine the evidentiary record, draw different inferences from it and arrive at another conclusion. As it turns out, we recognize that the original order should be modified and that the condition agreed upon by the Licensee and Staff and set out below, is appropriate. There is, however, a question of jurisdiction. Licensee's motion appears to us to be an untimely petition for reconsideration, and, standing alone, it would be beyond our jurisdiction. On the other hand we specifically retained jurisdiction to approve the Staff's implementation plan. Even though we did not invite the parties to challenge the decision itself, we see no merit in implementing an order we no longer support. The better course is to proceed as if we continue to have jurisdiction because, even if we do not, our ruling may assist the Appeal Board or the Commission upon any review.⁴

The Licensee has traced the evidentiary pathway to our earlier conclusion. We discussed the potential impacts on Unit 1 operations from disposition of the Unit 2 reactor core at PID ¶ 1254 where we found that fission gas activity in the Unit 2 reactor core is at less than detectable concentrations. In PID ¶ 1255 we found that the fuel handling building ventilation and filtration systems will be in service during (Unit 2) defueling operations in order to mitigate the consequences of a postulated fuel handling accident.

With an environmental barrier in place prior to restart, the only Unit 1 area that potentially could be affected by a Unit 2 fuel handling accident is the Unit 1 fuel handling area. PID ¶ 1256. If a Unit 2 fuel handling accident were to contaminate the Unit 1 fuel handling area, work in the Unit 1 area could be brought to a safe conclusion, the radiological problem could be addressed, and the Unit 1 fuel handling area would be available within a matter of days. *Id.* Fuel handling evolutions generally need not be performed immediately, so we concluded that any delay in gaining access to the Unit 1 fuel handling area would not adversely affect safe operation

⁴ In its order of March 4, 1982 the Appeal Board indicated that our views on the substance of Licensee's concerns would be useful.

of Unit 1 (*id.*); we also found that if a true safety need required quick entry to the Unit 1 fuel handling area, such entry could be made. *Id.* at n.157.

Nevertheless we stated that potential Unit 2 fuel handling accidents "will not adversely affect safe operation of Unit 1, *in that during any Unit 2 fuel movements, Licensee will suspend work in the Unit 1 area of the fuel handling building . . .*" [Emphasis added] See PID ¶ 1256. The source of this observation was the written direct testimony of NRC Staff witness Stoddart, ff. Tr. 10,159, at 22-23. This conclusion is contrary to the explicit assumption of other testimony that operations may be taking place in the Unit 1 fuel handling area during Unit 2 fuel movements. Tr. 10,062 (Fuhrer).

Licensee argues that we may have misunderstood the thrust of Mr. Stoddart's written testimony. His testimony states that "[s]uspension of work in the TMI-1 area during TMI-2 fuel movement will be a *procedural* requirement [emphasis added]." Stoddart, ff. Tr. 10,159, at 22-23. Later Mr. Stoddart refers to both hardware modifications and to "the described administrative controls", which probably refers back to the procedural requirement to suspend work. Licensee would have us construe this testimony as relating to *ad hoc* procedural controls that might be imposed on work in the Unit 1 fuel handling area depending upon the nature of fuel movements taking place in the Unit 2 fuel handling area, and not as an absolute requirement that work always be precluded in the Unit 1 fuel handling area during Unit 2 fuel movement.

Licensee recognizes, however, that its reading of Mr. Stoddart's testimony may not be free from doubt. But Dr. Bellamy, chief of technical support for the NRC's onsite Three Mile Island Program Office (TMIPO), provided testimony which, in Licensee's view, resolves the matter.

Dr. Bellamy testified that the Staff did not have in mind any specific cases where there would be a specific restraint on Unit 1 operation but that before any activities are approved at Unit 2, the Staff would impose an additional limiting condition of operation which in the Staff's judgment should be imposed. He was referring specifically to a situation where there could not be movement of Unit 1 fuel during movement of fuel from the Unit 2 pool. Tr. 10,206.

Having reconsidered the testimony of the Staff witnesses on the matter, the Board agrees that the record does not require an absolute bar to any work in the Unit 1 area during Unit 2 fuel movements. The Staff itself also now expressly agrees that such a ban is not necessary. Staff March 10 Response, at 3. As a result of Licensee's objection, the Staff discussed the matter with the Licensee and the Commonwealth of Pennsylvania and all agree that the condition may be reworded as follows:

During any Unit 2 fuel movements in the fuel handling building, the Licensee shall suspend work in the Unit 1 area of that building, unless the Licensee has submitted to the NRC Staff for its review specific written procedures for the planned movements of Unit 2 fuel and an evaluation of the potential impacts of those fuel movements on personnel working in the Unit 1 area of the building and the Staff has agreed that the potential impacts of the planned Unit 2 fuel movements on personnel working in the Unit 1 area of the building do not require that work in the Unit 1 area of the building be suspended.

Id.

The Board is satisfied with the modified condition.

Filtration During Fuel Handling

In PID ¶ 1326(a) we also required that “. . . whenever Unit 1 fuel movements are in progress, the engineered safety feature filtration systems for Unit 1 will be in operation.” Because of a potential need for prompt relief from the literal and unforeseen reach of this order the Licensee filed a separate motion on March 12 seeking clarification of its limits. We divided Licensee’s motion into its pre-restart and post-restart aspects, and on March 23 we clarified the order to exclude pre-restart engineered safety features (ESF) filtration as a Board requirement on jurisdictional and safety grounds. We now rule on the remaining aspects of the Licensee’s motion.

Licensee makes three additional requests for changes in the Board’s fuel handling order. First, we are requested to clarify that the ESF filter system need only be “operable”, rather than “in operation” during fuel movements because actual operation of the ESF filter system is initiated only during accident conditions. The Staff agrees (March 25 answer) and explains that it supports Licensee because the final design of an ESF filter system that is to be merely “operable” during fuel movements and put into operation only upon the occurrence of a fuel handling accident, rather than “in operation” during fuel movements, must include provisions for its automatic actuation by a safety grade actuation system that senses an appropriate signal and automatically actuates the ESF filter system. The Staff also notes that rewording the license condition as the Licensee requests would permit the condition to be satisfied by a final ESF filter system design that does not include such an actuation system if the ESF filter system is required to be in operation during TMI-1 fuel movements by either the technical specifications or the operating procedures.

The Board verified in a telephone conference on March 26 that the Licensee agrees that the Staff's characterization is accurate. On this basis we clarify our order accordingly. We use the term "clarify" intentionally although it might appear that Licensee's request was for reconsideration. This is because we would view an "operable" ESF filter system with provisions for automatic safety grade actuation to be, for practical purposes, in "operation" even though no filtration is actually demanded and performed at the time. In any event, the condition proposed by the Licensee satisfies the Board's original concern.

Second, Licensee wishes it clarified that the ESF filter system need be operable only when fuel is in transit within the fuel handling building because the system would serve no purpose when fuel movements are confined to the reactor building. Third, Licensee points out that the condition should not apply to fresh unirradiated fuel. Both of these requests reflect the intent of the original order and are appropriate for clarification. The following condition proposed by Licensee, and approved by the Staff, resolves all areas of fuel-handling clarification and is approved:

After the restart of Unit 1 and prior to the movement within the Unit 1 fuel handling building of any irradiated Unit 1 fuel, Licensee shall install, and have operable, an engineered safety features (ESF) filtration system for the Unit 1 fuel handling building. The ESF filtration system for Unit 1 shall be operable whenever irradiated Unit 1 fuel is moved with the Unit 1 fuel handling building.

Items That are Not Licensee Conditions

We directed the Staff to report how it intends to be assured that the Licensee will abide by any items the Staff does not plan to impose as license conditions or how it intends to be assured that the Licensee will seek relief from such items in an appropriate manner. PID ¶ 1217. The Staff reported:

The Staff does not propose to implement any special enforcement procedures for TMI-1 after restart. The normal enforcement procedures relied on by the Staff to assure compliance by all Licensees with items not specifically addressed in Technical Specifications or other license conditions will be relied on by the Staff to assure that the Licensee for TMI-1 operates TMI-1 safely [unless otherwise required by the initial decision].

Report at 9.

We have since discussed this matter on the record with the interested parties and the Staff informs the Board that it does not intend to exclude from its TMI-1 restart implementation program any special inspections or verifications required or depended upon by the Board with respect to requirements which did not rise to the level of license conditions or technical specifications. Tr. 27,015-19.⁵ With this understanding we approve the Staff's report with respect to items which are not license conditions or technical specifications. We will add then the following language (as it appears in brackets above) to the end of the Staff's statement:

“. . . unless otherwise required by the initial decision.”

References to Partial Initial Decision

Licensee requests that the Staff be directed to retain the parenthetical references to the partial initial decision and/or the evidentiary record which accompanies the items listed in the Staff's report. The purpose is to ensure that future questions about any condition can be resolved in the relevant context. We agree that this is appropriate — the Staff did not comment on this request. Moreover we would expect that any dispute would be discussed against the relevant background of the entire decision and relevant Board orders.

ORDER

As modified above, the Board adopts the Staff's implementation report of February 1, 1982 as the Board's order in this proceeding. It is appealable. For review purposes it should be treated as a Supplement to the Partial Initial Decision of December 14, 1981. Within ten days after service of this Order any party may take an appeal to the Appeal Board

⁵ TMI-1 restart project manager, Mr. Jacobs, stated that the Staff reviewed the initial decision for this purpose. While the project manager cannot recall whether the Staff identified anything specifically related to inspection following restart, he believes that the Staff would have captured any such requirement and that a special inspection required by the Board was not intended to be included in the phrase "normal inspection procedures". Tr. 27,018 (Jacobs). The Board itself is not aware of any special verification required to be performed outside the subject matter covered by license conditions. Our modification is a precaution against any oversight.

by filing exceptions to all or portions of it. A brief in support of the exceptions shall be filed within thirty days thereafter or within forty days in the case of the Staff.

**THE ATOMIC SAFETY AND
LICENSING BOARD**

**Walter H. Jordan
ADMINISTRATIVE JUDGE**

**Linda W. Little
ADMINISTRATIVE JUDGE**

**Ivan W. Smith, Chairman
ADMINISTRATIVE LAW JUDGE**

**Bethesda, Maryland
April 5, 1982**

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Charles Bechhoefer, Chairman
Dr. Frederick P. Cowan
Dr. Jerry Harbour

In the Matter of

Docket Nos. 50-329 OM
50-330 OM
Docket Nos. 50-329 OL
50-330 OL

CONSUMERS POWER COMPANY
(Midland Plant, Units 1 and 2)

April 12, 1982

The Licensing Board denies an intervenor's motion for suspension of construction pending resolution of an assertedly unresolved generic safety issue concerning the potential effects of electromagnetic pulse (EMP) on nuclear power plants.

**ADMISSIBILITY OF CONTENTION: ELECTROMAGNETIC PULSE
(EMP)**

A contention concerning the effect on a nuclear plant of electromagnetic pulses (EMP) possibly resulting from a nuclear detonation at a high altitude cannot be considered in an operating license proceeding, as a result of 10 CFR §50.13, which expressly does not require operating license applicants to provide design features or other measures for protection against the effects of enemy attack or the deployment of weapons incident to national defense activities.

MEMORANDUM AND ORDER
(Denying Wendell Marshall's Motion for
Termination of Construction Pending
Resolution of EMP Issue)

On December 16, 1981, Mr. Wendell H. Marshall, representative of the Mapleton Intervenors and a party in the pending operating license proceeding, filed a letter (which we interpret as a motion) asking this Board to halt construction of the Midland facility pending resolution of an assertedly unresolved generic safety issue concerning the potential effects of electromagnetic pulse (EMP) on nuclear power plants. In letters dated January 21, 1982 (at pp. 10, 15) and February 23, 1982, Mr. Marshall provided further comments on the EMP question. And by letters dated March 22 and 25, 1982, Mr. Marshall reiterated his request to stop construction. In responses dated December 28, 1981 and January 25, 1982, the Applicant and Staff, respectively, opposed the request on the basis of its lack of relevance to the ongoing OM proceeding and, hence, its not being properly before this Board.

As we understand it, the electromagnetic pulses to which Mr. Marshall is referring would possibly result from a nuclear detonation at a high altitude and could affect the operation of nuclear plants. The NRC Staff is apparently conducting certain studies on the effects of EMP on nuclear plants. We agree with the Applicant and Staff that this matter is not relevant to the soils matters which are presently before this Board. Beyond that, the matter cannot be considered as a part of our forthcoming operating license review, since it is barred by 10 CFR §50.13, which provides

An applicant for a license to construct and operate a production or utilization facility, or for an amendment to such license, is not required to provide for design features or other measures for the specific purpose of protection against the effects of (a) attacks and destructive acts, including sabotage, directed against the facility by an enemy of the United States, whether a foreign government or other person, or (b) use or deployment of weapons incident to U.S. defense activities.

To the same effect, see *Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant, Units 1 and 2), LBP-81-42, 14 NRC 842 (1981); *id.*, LBP-81-57, 14 NRC 1037 (1981).

For the foregoing reasons, it is, this 12th day of April, 1980
ORDERED

That Wendell H. Marshall's request for us to halt further construction on the Midland facility pending resolution of the EMP question be, and it hereby is, *denied*.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

Charles Bechhoefer, Chairman
ADMINISTRATIVE JUDGE

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Herbert Grossman, Chairman
Robert L. Holton
J. Venn Leeds

In the Matter of

Docket No. 50-367
(Construction Permit
Extension)

NORTHERN INDIANA PUBLIC
SERVICE COMPANY
(Bailly Generating Station,
Nuclear-1)

April 12, 1982

Licensing Board issues proposed order to terminate the proceeding involving an application for extension of the construction permit's construction completion date. The termination would be conditioned upon applicant's implementing a Board-approved site restoration plan under Staff supervision, but not upon applicant's paying intervenor's attorneys' fees and expenses.

LICENSING BOARDS: DISMISSAL OF PROCEEDINGS

Board weighs reasons for granting termination conditioned upon implementation of site restoration plan against those for requiring restoration before termination, and proposes immediate, conditional termination.

LICENSING PROCEEDINGS: DISMISSAL; ATTORNEY'S FEES

Absent statutory exception, the "American Rule" of not awarding attorneys' fees and expenses is binding upon administrative agencies. *Turner v. FCC*, 514 Fed. 1354 (D.C. Cir. 1975).

LICENSING PROCEEDINGS: DISMISSAL; ATTORNEYS' FEES

Even if the Commission has the authority to do so, it has not adopted a policy of awarding attorneys' fees and expenses.

LICENSING PROCEEDINGS: DISMISSAL; ATTORNEYS' FEES

The exception to the "American Rule" of not awarding attorneys' fees and expenses embodied in the Federal Rules of Civil Procedure, which permits the award to prevent a duplication of expenses where the dismissal is without prejudice, does not apply to the termination of a construction permit extension proceeding.

MEMORANDUM AND ORDER (Issuing Proposed Order Terminating Proceeding)

MEMORANDUM

The Board has before it a number of unresolved questions concerning the method and timing of the termination of this proceeding in light of Northern Indiana Public Service Company's (NIPSCO's) decision not to complete construction of the Bailly Generating Station. In our order of January 29, 1982, we approved NIPSCO's revised site restoration plan and directed NIPSCO to begin implementing that plan forthwith. Instead, NIPSCO has moved for reconsideration of the order and evinces a reluctance to begin site restoration without the finality of a termination order that decides in advance all of the conditions under which the project is to be terminated. Staff agrees with NIPSCO. Porter County Chapter Inter-venors (PCCIs) seek to delay the issuance of an order of termination until NIPSCO has completed site restoration according to the agreed-upon plan, so that the Board can retain jurisdiction to insure that the plan is properly implemented.

Other matters pending include the questions of whether the termination of the proceeding should be "with prejudice" or "without prejudice," and whether the termination should be conditioned upon NIPSCO's payment of PCCIs' expenses and attorney's fees in the proceeding. A further question raised by PCCIs, as to whether discovery should be permitted with regard to site restoration, unlike the other questions which we answer directly in this order, would be mooted by our decision to terminate the proceeding (thereby precluding the possibility of further discovery). PCCIs' concerns

are addressed indirectly by the reporting requirements made a condition to termination.

A. Termination at this Juncture

The Board has weighed a number of considerations for and against terminating the proceeding at this juncture. Some of the reasons for not terminating are, as follows:

- (1) The excavation to be backfilled has been in existence for a number of years. The lack of financial incentive to fill it, general corporate inertia, and the absence of initiation and completion dates in the restoration plan, suggest the possibility of an extended or indefinite delay in completing (or even beginning) the restoration.
- (2) Incorporating the terms of the revised site restoration plan in the termination order would seem to foreclose the possibility of modifying the plan without breaching the terms of the termination order regardless of how beneficial such change might appear. No machinery would exist for modifying the site restoration plan.
- (3) In the event that NIPSCO were to breach the terms of the site restoration plan, made a condition of the termination order, or merely fail to continue to implement the plan, the means of enforcing the conditions or even conferring jurisdiction upon a responsible instrumentality are hazy, at best.
- (4) Were the Board to withhold the termination until the site restoration plan is implemented, we could insure its implementation within a reasonable time, permit reasonable modifications to the plan after giving full weight to the positions of the parties, and serve as an inducement for NIPSCO to complete the site restoration (in order to terminate the proceeding).

On the other hand, we see the following reasons to terminate the proceeding at this juncture:

- (1) By not terminating, we run the risk of wasting valuable Board time in considering petty disputes, promoted to litigable issues because of the basic antagonism between the parties, as amply evidenced in the past (and at present, by the current discovery dispute).
- (2) The mechanical function of supervising the implementation of a site restoration plan should not require the presence of a hearing board and the Staff believes that it is able to insure implementation.

- (3) By insisting upon termination at this juncture with the current site restoration plan as a condition of termination, NIPSCO apparently accepts the immutability of the terms of the plan and, consequently, is willing to forego the possibility of any future modification even under changed circumstances.
- (4) Finally, but not the least in our consideration, there is the Appeal Board's approval of the general procedure of terminating proceedings subject to site restoration conditions, rather than having the Licensing Board supervise the restoration and then terminate the proceeding. *Toledo Edison Company* (Davis-Besse Nuclear Power Station, Units 2 and 3), ALAB-622, 12 NRC 667 (1980); ALAB-652, 14 NRC 627 (1981). To depart from a general procedure sanctioned by the Appeal Board, even under reasonable (but not compelling) circumstances, stands little chance of success.

On balance, we have found most weighty NIPSCO's willingness to bind itself to the exact terms of the current site restoration plan and Staff's confidence in its ability to insure the implementation of the site restoration plan even in the absence of a live proceeding over which the NRC has undisputed jurisdiction. Moreover, we are spelling out in considerable detail the requirements for site restoration, including initiation and completion dates, reporting requirements, and an inspection requirement, consonant with the general provisions of the site restoration plan, to insure either that the plan is fairly implemented within a reasonable time or that a firm basis is established for taking action to compel implementation.

B. Termination With or Without Prejudice

NIPSCO and Staff take the position that the termination of this proceeding should be without prejudice; PCCIs contend that it should be with prejudice. As we read the submittals of the respective parties and the cases upon which they rely, *Philadelphia Electric Company* (Fulton Generating Station, Units 1 and 2), ALAB-657, 14 NRC 967 (1981) and *Puerto Rico Electric Power Authority* (North Coast Nuclear Plant, Unit 1), ALAB-662, 14 NRC 1125 (1981), we see only a semantic difference between the parties. It appears to us that the parties and the Board are in agreement on the effect that termination of this proceeding should have on future activities at the Bailly site, notwithstanding the parties' disagreement as to how the effect should be characterized.

As we understand that effect, which would be automatic (by operation of law) even without our characterizing the termination, Construction Permit No. CPPR-104 will expire without opportunity for further extension because the time for filing a timely application for extension has

passed. Since there has been no decision adverse to NIPSCO's building a nuclear plant at the Bailly site, NIPSCO would be free to file a new application to construct a nuclear plant on that site. We see no reason to depart from that result by either failing to specifically foreclose NIPSCO from reviving Construction Permit No. CPPR-104, or by permitting the expiration of that permit to prejudice NIPSCO's right to file a new application for a construction permit. We would spell out that result to assure its certainty.

C. PCCIs' Claim for Attorney's Fees and Expenses

On the basis of the recent Appeal Board decision in *North Coast*, ALAB-622, *supra*, PCCIs have moved the Board to impose the condition upon NIPSCO's withdrawal of its application for extension of construction permit that NIPSCO pay PCCIs' expenses and attorneys' fees in this proceeding. In particular, PCCIs rely upon footnote 11 to that decision (Slip Op. at 17), which reads as follows:

We note that the case at bar did not entail lengthy discovery, or proceed through the trial stage. It hardly got off the ground. We leave open the question whether something short of a dismissal with prejudice, such as conditioning withdrawal of an application upon payment of the opposing parties' expenses, might be within the Commission's powers and otherwise appropriate where the expenses incurred were substantial and intervenors developed information which cast doubt upon the merits of the application.

NIPSCO and NRC Staff oppose the imposition of that condition primarily on the grounds that the Commission lacks the authority to award attorneys' fees and expenses and that the circumstances for awarding those fees and expenses do not exist in this proceeding. We decline to impose that condition.

Under the "American Rule," attorneys' fees and expenses are borne by the respective parties. They are not awarded to the prevailing party, as in England. The Supreme Court has recently reaffirmed the American Rule and indicated that it would recognize only statutory exceptions to the rule. *Alyeska Pipeline Service Co. v. Wilderness Society*, 421 US 240 (1975); *F. D. Rich Co. v. United States*, 417 U.S. 116 (1974). Absent a statutory exception, the American Rule is not only binding upon courts but upon administrative agencies as well. *Turner v. FCC*, 514 F.2d 1354 (D.C. Cir. 1975).

PCCIs attempt to create for themselves an exception based upon NRC rules that is analogous to an exception recognized under the Federal Rules of Civil Procedure. Federal Rule 41(a)(2) permits a plaintiff to dismiss his action only "upon such terms and conditions as the court deems proper."

Cases dismissed without prejudice under that rule have permitted the allowance of attorney's fees against the dismissing party. PCCIs contend that the language of 10 CFR §2.107(a) similarly permits the awarding of attorney's fees and expenses by requiring that the withdrawal of an application after the issuance of notice of hearing be "on such terms as the presiding officer may prescribe."

Even if PCCIs' are correct that the wording of 10 CFR §2.107(a) is similar to Federal Rule 41(a) and that Licensing Boards have the authority similar to Federal courts to award the fees and expenses under an exception to the American Rule, the requisite conditions are absent in this proceeding. In *Smoot v. Fox*, 353 F.2d 830, 833 (6th Cir. 1965), the Court of Appeals recognized that the cases permit the awarding of attorney's fees against the dismissing party only when the action is dismissed without prejudice. The reasoning for such rule, the court observed, is to compensate the defendant for expenses in preparing for trial in light of the fact that a new action may be brought in another forum. However, where the dismissal is with prejudice, fees and expenses will not be awarded because the cause is finally being terminated and the defendant cannot be made to defend again.

In the instant proceeding, that reasoning would preclude awarding PCCIs their attorneys' fees and expenses. Whether the termination of this proceeding is with or without prejudice, the effect of termination is to rescind the construction permit with finality. Where the statute of limitations has run on filing an application for extension of the construction permit (as it has here, under 10 CFR §2.109), even a dismissal without prejudice is a final determination of applicant's rights to the construction permit which cannot be further litigated. Cf. *Carr v. Grace*, 516 F.2d 502 (5th Cir. 1975). To extend the Federal Rule 41(a)(2) exception so as to award attorneys' fees and costs, where the effect of the termination is equivalent to a determination on the merits against the dismissing party, would constitute a repudiation of the American Rule, not an exception. We do not believe that the decided cases establish a basis for awarding the fees and expenses under those circumstances.

We recognize that NIPSCO will be free to file a further application for construction permit for the Bailly site, notwithstanding the expiration of the current construction permit, upon the withdrawal of the application for extension. If NIPSCO does file a further application and PCCIs choose to oppose it, PCCIs will incur further expenses. We cannot, however, equate the expenses incurred in this proceeding, involving only the merits of whether good cause had been established for extending the existing construction permit, with those that might be incurred in a further construction permit proceeding where the issues would be entirely different. Only the expenses already incurred in the *original* construction permit proceed-

ing can logically be considered as subject to duplication in a future construction permit proceeding involving the same site, and we are not being asked to condition our termination on the recovery of those expenses incurred in the prior litigation—a matter clearly outside of the Board's power.

Moreover, even if the Commission has the authority to condition a termination upon a reimbursement of the contested expenses beyond the scope of judicial precedent, this Board lacks the authority to impose such a condition. We can go only as far as established precedent without adopting new Commission policy, and Commission policy can only be adopted by the Commission itself. The licensing and appeal boards are not empowered to make policy. *Offshore Power Systems (Floating Nuclear Power Plants)*, CLI-79-9, 10 NRC 257, 261 (1979); *South Carolina Electric and Gas Company (Virgil C. Summer Nuclear Station, Unit 1)*, LBP-81-47, 14 NRC 866, 875 (1981), affirmed on other grounds, ALAB-663, 14 NRC 1140 (1981). We find no indication that the Commission has adopted a policy that goes beyond the established exceptions to the American Rule, none of which apply to the instant proceeding.

D. Conditions Imposed on Termination of this Proceeding

In addition to conditioning the termination upon the revised site restoration plan, the Board considers it imperative that further conditions be imposed to ensure that the site is restored without delay. Taking into account the revised site restoration plan's estimate (at p. 2) of approximately 120 days to complete backfilling (which will not begin, if the dredging option is elected, until the summer of 1982), the Board considers it reasonable to require the backfilling operations to begin by August 1, 1982 and to be completed by September 1, 1983. These time requirements would permit NIPSCO to elect the dredging option with the knowledge that, under unforeseen circumstances, dredging could be continued through two summer seasons if necessary. To ensure that the parties and NRC Staff are kept informed of the progress of site restoration, the Board would impose a periodic reporting requirement on NIPSCO that can easily be accommodated. Similarly, to ensure satisfactory completion of the site restoration, or provide a basis for agency or judicial intervention if the site restoration is not satisfactorily completed within a reasonable time, the Board would impose a notification and inspection requirement upon completion of the project (or on the required completion date, whichever is appropriate). We would also require a completion report by NRC Staff to the NRC Commissioners.

E. Proposed Order.

The following is our proposed order:

PROPOSED ORDER

1. That NIPSCO's motion to terminate proceeding is granted and its application for extension of construction permit is deemed withdrawn on the conditions set forth in the following paragraphs;

2. That Construction Permit No. CPPR-104 is deemed to have expired without further opportunity to NIPSCO to revive such permit;

3. That neither the expiration of Construction Permit No. CPPR-104, nor the termination of this proceeding (or any matters that have transpired during this proceeding), shall preclude NIPSCO from applying for a new construction permit in the future with regard to the Bailly site;

4. That NIPSCO must implement the revised site restoration plan agreed to by NIPSCO, NRC Staff, and PCCIs, and approved by the Board by Order dated January 29, 1982;

5. That NIPSCO must begin implementation of that plan no later than August 1, 1982;

6. That NIPSCO must complete the implementation of that plan no later than September 1, 1983;

7. That NIPSCO and NRC Staff must send a report (jointly, if possible, or separately) to each of the individuals and organizations currently on the service list on June 1, 1982 and the first day of each third month thereafter, and on the completion date of the site restoration (but no later than September 1, 1983 if not completed), reporting on the progress of the site restoration, to include a description of all activities undertaken and all matters accomplished; an estimate of the percentage of completion of the site restoration; and an estimated completion date for site restoration;

8. That, at the completion of the site restoration, but no later than September 1, 1983, if not completed, NIPSCO is to give notice of, and arrange for, an inspection of the site (under reasonable conditions) between 10 and 20 days thereafter at which each party, if an individual, or one representative from each organization party (even if intervening jointly with other organizations), may be present;

9. That, in the event NIPSCO has not completed its site restoration by September 1, 1983, NRC Staff must file a complete report with the NRC Commissioners, with copies to those currently on the service list,

describing the status of the site restoration, giving the reasons why the site restorations has not yet been completed, and making recommendations for future NRC actions to compel the completion of site restoration;

10. That there be no modifications to the site restoration plan or the other conditions herein imposed upon NIPSCO with regard to site restoration without the approval of a representative of the Business and Professional People for the Public Interest (BPPI), which shall be deemed to have succeeded to the interests of PCCIs upon termination of this proceeding (or a representative for PCCIs if the proceeding has not yet been terminated);

11. That the conditions imposed by this termination order be considered as an obligation assumed by NIPSCO in consideration of the Commission's terminating this proceeding prior to the restoration of the site, enforceable by the NRC Commission and the courts.

ORDER

For all of the foregoing reasons and based upon a consideration of the entire record in this matter, it is, this 12th day of April, 1982

ORDERED

That the parties shall have 12 days from the service of this Memorandum and Order to file objections and/or requested modifications to the proposed order, stating their reasons. No replies will be permitted, except by further order of the Board.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Herbert Grossman, Chairman
ADMINISTRATIVE JUDGE**

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

James P. Gleason, Chairman
Paul W. Purdom
Glenn O. Bright

In the Matter of

Docket Nos. 50-387-OL
50-388-OL

**PENNSYLVANIA POWER AND
LIGHT COMPANY and
ALLEGHENY ELECTRIC
COOPERATIVE, INC.**

**(Susquehanna Steam Electric
Station, Units 1 and 2)**

April 12, 1982

The Licensing Board issues its Initial Decision, presenting findings of fact and conclusions of law on the matters in controversy and authorizing the issuance of an operating license consistent with the conclusions of the Board. The issuance of a license is made subject to certain conditions which require the Director of Nuclear Reactor Regulation to make findings on several emergency planning matters. The license is also subject to the outcome of radon proceedings pending before the Atomic Safety and Licensing Appeal Board.

TECHNICAL ISSUES DISCUSSED:

Quantities and health effects of isotope, Technetium; need for power; emergency evacuation; stress corrosion cracking; decommissioning; low-level waste storage; health effects of transmission lines; emergency planning; scram discharge volume breaks.

APPEARANCES

**Messrs. Jay Silberg, Esq., Matias F. Travieso-Diaz and Bryan A.
Snapp, Esq. for the Applicants**

Dr. Judith Johnsrud, State College of Pennsylvania for the Intervenor, Environmental Coalition on Nuclear Power

Thomas J. Halligan, Berwick, Pennsylvania for the Intervenor, Citizens Against Nuclear Dangers

Gerald Schultz for the Intervenor, Susquehanna Environmental Advocates

Robert Adler, Esq., Assistant Attorney General, for the Commonwealth of Pennsylvania

James M. Cutchin, IV, Esq. and Mary E. Wagner, Esq. for the Nuclear Regulatory Staff

INITIAL DECISION

OPINION

I. BACKGROUND

This is a decision on an application from the Pennsylvania Power and Light Company and the Allegheny Electric Corporation, Inc. (Applicants) for a license to operate a nuclear power plant. The application is for the operation of two boiling water nuclear reactors, Units 1 and 2, at the Applicants' Susquehanna Steam Electric Station site, in Luzerne County, Pennsylvania. Permits to construct the units, each of which has a rated output of 1,085 megawatts of electrical power were issued in November 1973.¹

In addition to Applicants and Staff, the parties to this proceeding are the Commonwealth of Pennsylvania (Commonwealth), the Susquehanna Environmental Advocates (SEA), the Environmental Coalition on Nuclear Power (ECNP), the Citizens Against Nuclear Dangers (CAND) and Colleen Marsh (in behalf of herself and 11 other individuals). A Licensing Board originally approved the admission of 18 contentions for litigation purposes² and three additional contentions were subsequently accepted.³

¹ 43 Fed. Reg. 35406.

² See Board Memorandum and Order, October 26, 1978.

³ LBP-79-29, 20 NRC 586 (1979); Board Memorandum and Order of July 7, 1981. As a result of Commission action on Table S-3, (44 Fed. Reg. 45362), the Board permitted Technetium-99 to be considered in a contention dealing with the uranium fuel cycle.

The Board⁴ conducted eight days of prehearing sessions. Limited appearance statements were received from members of the public on March 20-21, 1980 and October 8, 19 and 23, 1981.

As a result of the withdrawal of six contentions by party intervenors and the granting of summary disposition motions filed by the Applicant and Staff,⁵ nine contentions remained at issue for the hearing:

- Quantity and health effects of technetium⁶ (Contention 1)
- Need for power (Contention 4)
- Evacuation (Contention 6)
- Unresolved generic safety issue (Contention 7)
- Decommissioning (Contention 9)
- Storage of low-level radioactive waste (Contention 11)
- Health effects of electric fields (Contention 17)
- State and County emergency planning (Contention 20)
- Scram discharge volume break (Contention 21)

The decisional record of the proceeding consists of a) the Commission's Notice of Hearing; b) the petitions and pleadings filed by the parties; c) the transcripts of the hearing, and d) the exhibits received into evidence.

This Board's jurisdiction is limited to a determination of findings of fact and conclusions of law on matters put into controversy by the parties to the proceeding or found by the Board to involve a serious safety, environmental or common defense and security question.⁷ The Board has made no such additional determinations in this case.

II. CONTENTIONS

1. Health Effects of Nuclear Fuel Cycle

The sponsors of Contention 1 questioned the quantities and health effects of various isotopes released throughout the uranium fuel cycle. Following summary dispositions by the Board and a stipulation of the parties, the issue narrowed to the assessment of the quantity and health effect of Technetium (Tc-99) released during the fuel cycle as a result of

⁴ The Atomic Safety and Licensing Board appointed to consider this matter was reconstituted. (46 Fed. Reg. 18826)

⁵ See Board Orders of March 16, 1981, May 20, 1981, July 27, 1981, August 31, 1981, September 23, 1981, September 29, 1981, October 12 and November 2, 1981. (Also see Tr. p. 1018 and p. 1834 on Contentions 14 and part of 2.)

⁶ Part of Contention 1 was eliminated by stipulation between ECNP, Applicants and Staff. The stipulation, which was approved by the Board, provides that the Susquehanna operating license will be subject to the outcome of the consolidated radon proceedings currently pending before the Appeal Board.

⁷ 10 CFR 2.760(a)

the operation of Susquehanna and the impact of this assessment on the cost benefit balance.

Technetium Production and Releases

Tc-99 is produced by fission in the operation of a reactor such as Susquehanna. Reactor operation yields Tc-99 at a rate of 390 to 500 curies (Ci) per reference reactor year (RRY). Because the reactor fuel is encapsulated, essentially all of the Tc-99 produced is retained within the fuel assemblies until they are processed. The potential for release and the rate of release of Tc-99 from the spent fuel to the environment depends on the type of fuel cycle; in a once-through fuel cycle, the spent fuel stored at reactors or in interim facilities is packaged for ultimate disposal in a stable geologic repository. Proper design and siting will provide reasonable assurance of long term isolation. (Board Findings 4, 5, 6, and 8).

In the uranium-only recycle option, spent fuel is sent to a reprocessing plant. There uranium is separated from the fission products. The remainder of the Tc-99 goes to the high level liquid waste (HLLW) treatment facility and thence to a geologic repository. Except for minor releases to the atmosphere during solidification, essentially all the Tc-99 in the high-level liquid waste stream is contained in the solidified packaged material sent to the geologic repository. The Tc-99 accompanying the uranium is virtually all separated out and sent to a low-level, near surface burial facility. Small atmospheric releases of Tc-99 may occur during HLLW processing, during UF_6 conversion, and at the enrichment plant. In addition, there would be surface water discharges during the enrichment process. (Board Findings 7, 8, and 9).

Technetium Disposal

The intervenor, ECNP, claims that in the absence of certainty concerning permanent disposal of Tc-99 bearing wastes, the quantity and radiological health effects of Tc-99 associated with Susquehanna have not been properly factored into the cost-benefit balance for the plant. The point is made by ECNP that no waste repository can be guaranteed to provide perfect containment for a million years and it objects to the fact that no selection of a geological medium or media for disposal has been made.

While it is true that no repositories have been selected, Applicants' witness testified that stable geologic repository sites capable of meeting proposed technical criteria do exist and he believes such a site, isolated

from groundwater over long periods of time, will be obtained. For the purposes of his analysis, he used the criteria in the proposed 10 CFR Part 60, which provides for containment package integrity for a minimum of 1000 years after which the maximum release rate would not exceed one part in 100,000 of the inventory per year thereafter. However, for this analysis, all of the Tc-99 was assumed dissolved in groundwater over a period of 100,000 years. The witness said he does not really believe that a mechanism exists for migration of the Tc-99 from the repository to surface water (Englehart, Tr. 1857).

The Board finds that there is no need to assume that the geologic repository will provide perfect containment for a million years, but rather that releases expected from the repository after 1000 years have been factored into the cost-benefit analysis to meet the requirements of 10 CFR part 60. In view of the unrefuted testimony that geologic sites exist that meet the criteria, Applicant's assumption that sites will be made available is reasonable.

Assessment of Doses and Health Effects

ECNP argues further, that in the absence of summation of doses and health effects of all Tc-99 associated with the operation of Susquehanna 1 and 2 for the full detoxification period, its quantities and health effects have not been adequately assessed.

The Applicants' expert on the environmental effects of the nuclear fuel cycle reviewed the basic assumptions and calculations for estimating the releases of Tc-99 for the fuel cycle associated with the operation of Susquehanna. Utilizing models for his calculations, the witness quantified Tc-99 releases attributable to Susquehanna and the radioactive dose commitments caused by such releases. The witness found the results in population doses insignificant compared with those from natural background.

The Staffs' expert witnesses presented independent calculations estimating the quantities of Tc-99 which would be released from a supporting fuel cycle for light water cooled reactors like Susquehanna and the health effects resulting from such Tc-99 releases. The conclusion was similar to the Applicants', namely, that population doses from Tc-99 releases were insignificant when compared with the natural background exposures and that its impact could not influence the cost benefit balance for the facility.

The releases of Tc-99 were computed for once-through and uranium-only recycle options by Applicants on an annual basis. These releases were the basis for calculations of doses expected from operation of Susquehanna. The Applicants assumed the maximum of 500 Ci/RRY is available for

potential releases. The Staff computed releases independently and from these estimated doses and risks. The Staff made computations for 100 and 1000 years. Cumulative releases were computed for the first 2000 years and an annual release thereafter. Population doses similarly were estimated for the first 2000 years cumulatively and on an annual basis thereafter. Therefore, it would be untrue to say that the doses have not been calculated for the full detoxification period. A summation was not made because it was felt such calculations so far into the future would be meaningless because of uncertainties inherent in such projections.

ECNP is also concerned that the dose to a maximally exposed individual was not calculated and that calculations made were theoretical and hypothetical. ECNP further claims that natural background radiation and doses therefrom have nothing to do with the Susquehanna facility and its operations.

The Board finds, that Applicants have reasonably assessed the doses and health effects resulting from Tc-99 releases associated with fuel cycle for Susquehanna even though no summation has been made. This is so even though exposure to the maximally exposed individual was not computed. The testimony shows that such an individual would receive nowhere near the population doses calculated, which were insignificant compared to natural background doses. (Englehart, ff. Tr. 1852 at pp. 20-21). The fact that computations were based on theoretical calculations and hypothetical assumptions is not in itself a basis for discrediting the estimates so long as there is a sound basis for them. There was no testimony in refutation of the testimony presented and cross-examination failed to discredit the witnesses and their computations and assumptions. Calculations and parameters were based on NUREG-0002, the Generic Environmental Statement on Mixed-Oxide Fuel (GESMO). While these proceedings have been interrupted, there was no suggestion that the models used were invalid.

ECNP also questions the assumption for residence time for Tc-99 in soil in view of the variability of this factor in different soils. The Applicants' witness used a factor of 15 years when a factor of 30 years for residence time was used in one of the references cited. The witness explained that he felt the residence time used would be appropriate for a mixture of inorganic and organic soils and if other times were used, it would alter other factors in a compensating way. The Board finds the approach taken by the witness is reasonable.

Finally, notwithstanding the Intervenor's objection, the Board accepts comparisons of doses with those experienced from natural background as reasonable. Other Boards have accepted such comparisons and so has the Appeal Board. Of course, the operation of Susquehanna does not enter into background doses, but it is significant to know the relative magnitude of

Susquehanna's estimated doses in comparison with the radiation that humans experience and have experienced for generations.

Conclusion

The Board finds the testimony of Applicants and Staff's witnesses consistent and the testimony is not refuted. Intervenors presented no direct testimony by experts and its cross examination failed to impeach the credibility and conclusions of these witnesses. While ECNP draws conclusions from this testimony at variance from the Staff and Applicants, the Board's review of the testimony in its entirety does not suggest that the concerns of ECNP form a valid basis for questioning the calculations and the findings of the Staff and Applicants based on them.

The Board finds the degree of scientific data presented by the Applicant and Staff is sufficient to conclude that the methods for calculations are adequate and that doses and health effects from Tc-99 from the fuel cycle for Susquehanna are shown to be insignificant. The Board finds the comparison(s) with natural background radiation a valid measure of the significance of doses. However, that is not the only basis for making such a conclusion. The doses themselves are very small and the potential effects will not be measurable.

2. Need for Power

The proponents of Contention 4 questioned the need for the Susquehanna facility on the grounds of a) low growth rate; b) electric capacity in excess of needs; c) inadequate conservation programs; and d) failure to consider alternatives such as solar energy. Prior to the hearing, the Board granted summary disposition motions filed by the Staff on 4c and 4d, but denied such motions on 4a and 4b.

Simply stated, the remaining parts of the contentions allege that Applicants' existing capacity can meet customers' needs for the next 30 years (plant's useful life period), and that the output from Susquehanna will be available for sale outside the service areas of the Applicants. If this is true, the intervenors state, the cost-benefit balance is tilted against authorization of an operating license for Susquehanna.

Capacity and Growth

Testimony by Applicants and Staff shows that existing capacity can meet current needs of customers in the service areas. The forecast for

annual rate of growth in demand has been revised downward by Applicants from 2.5 percent to 2.2 percent and peak demand growth rate from 2.2 percent to 2.0 percent. The Applicants and Staff concede that the addition of Susquehanna will provide a greater reserve margin than required. The Applicants project, however, that requirements for the winter peak of the Pennsylvania-New Jersey-Maryland Interconnection (PJM), in which they participate, mean the Applicants need additional capacity by the mid-1990s. Since lead time of construction is about 10 years, this capacity would have to begin construction in mid-1980s. This evidence contradicts that part of the contention that claims such facilities are not needed for the next 30 years.

Even though there appears to be no immediate need for additional capacity, the evidence shows that Susquehanna will provide less costly operations than the plants whose operations will be replaced. These benefits will accrue to the Applicants' customers. Hence, one of the justifications for operation of Susquehanna is that there will be operational cost savings that will benefit the customers. And conversely, it would be more costly to customers if Susquehanna is not permitted to operate. Witnesses for both the Applicants and Staff pointed to other actions besides reserve margin to be considered in assessing costs and benefits including fuel diversity and conservation of oil as well as operating cost savings. (Board Finding 34.)

The Applicants estimated that, even with an assumption of no growth in demand, their customers would still benefit in less costly operations from the operation of the Susquehanna facility. The Staff's witness projected a saving even if a negative growth rate existed so that a benefit would still flow to its customers.

With respect to the portion of the contention that alleges electric power produced by Susquehanna will be available to sell outside the service areas of the Applicants, the Applicants deny the validity of the claim. The Susquehanna production, which is cheaper, will be the basis for billing customers of the Applicants in the service areas. More costly operation will not necessarily be shut down, but instead that production will be sold to PJM as needed where it is still cheaper than other capacity available to PJM. Such sales are also beneficial to the Applicants customers.

Costs of Abandonment

Evidence in the hearing, that was unrefuted, showed an abandonment of Susquehanna would cost, depending on conditions of growth, between \$6.6 billion to \$9.2 billion from 1983 to 1992. These costs, in terms of revenue requirements, were reduced to half if only one unit was abandoned.

Some costs for ratepayers may go up if and when Susquehanna goes on line because the utility is permitted to recover total costs, including capital costs. However, these costs are partially offset by lower fuel costs for Susquehanna and sales of other power output to PJM. (Board Finding 37.)

In this case, the Board has to determine if an operating license is to issue. Plant construction is virtually completed. It is idle speculation to consider if a plant should have been built. It has been. Thus, the decision is between permitting the plant to operate or abandoning it. Most of the capital costs have been incurred and must be considered whether the plant is operated or abandoned. It deserves mention here that due to consideration of these kinds of issues, the Commission has removed the need for power issue from operating license proceedings effective April 26, 1982. (47 CFR 12940.)

Under these circumstances, the Board finds it appropriate to consider the savings in fuel costs resulting from operation of Susquehanna as compared with alternates with more expensive fuels. It is also appropriate to consider costs of abandonment in comparison with operation. The Board sees no objection to PP&L's plan to sell electricity from existing plants that are more expensive to operate than Susquehanna to other members of PJM.

Conclusion

Because of the lower operating costs and costs of abandonment versus operating, the cost-benefit balance is tilted in favor of issuing an operating license. The Board concludes that neither low growth nor excessive capacity nor both support the contention that a license should not be granted.

3. Evacuation Emergency Plan

Each of the four Intervenors in the proceeding proposed parts of Contention 6 relating to the Applicants' responsibilities to provide protective action in the event of a serious accident. In addition to raising an issue of the necessity of evacuating people outside the facility's low population zone, questions were raised over alleged lack of training for personnel participating in evacuation procedures and also the ability — or lack thereof — of an important State agency, the Office of Radiological Health, to respond during an incident.

New Regulations

Prior to March 6, 1979, when the proposed contentions on this aspect of emergency requirements were accepted by the Board, evacuation considerations beyond the low population zone were not required by the Commission's regulations. See New England Power Company *et al.* (NEP Units 1 and 2), ALAB-390, 5 NRC 733, 747 (1977). Subsequent to the Three Mile Island occurrence, emergency imperatives for operating licenses were raised and upgraded. New regulations became effective on November 30, 1980. During the same time frame, a joint report of the Nuclear Regulatory Commission (NRC) and Federal Emergency Management Agency (FEMA) was adopted which established criteria to guide the preparation and evaluation of radiological response plans (i.e., emergency preparedness), in support of nuclear power facilities. Under the new scheme and regulations, FEMA reviews and determines the adequacy of all off-site nuclear planning and response (State and local government) and the NRC reviews and judges the Applicants' on-site emergency planning and the findings made by FEMA. It is clear the regulations contemplate the integration of off-site and on-site emergency plans and necessitate a close working relationship between State and local officials with the Applicant.

NRC's new regulations extend planning requirements to emergency planning zones surrounding a nuclear facility. These areas, with a radius of approximately ten miles and designated as the plume exposure pathway, Emergency Planning Zone (EPZ), are considered as a region where projected doses from traditional design basis accidents would not exceed Protective Action Guides outside of the zone. Emergency planning is deemed essential within the zone to assure that prompt and effective actions can be taken to protect the public in the event of an emergency. The regulations bring out that operating licenses will not be issued absent a finding by the NRC that the state of emergency planning (off-site and on-site) provides a reasonable assurance that adequate protection measures can and will be taken in the event of a radiological emergency. (See Board Findings 49 and 50.)

Notification and Evacuation

The procedures for notifying the public in an emergency at Susquehanna involve, in a sequential pattern, actions by the licensee, the State and local government officials. (Board Findings 51 and 52.)

The Applicants' plan calls for the notification to be communicated to State and local government officials in the plume exposure planning zone

within fifteen minutes of an initial declaration of any level of emergency. After assessment of the incident, recommendations for appropriate protective action are forwarded to the state Bureau of Radiation Protection (BRP) which, in turn, advises the Pennsylvania Emergency Management Agency (PEMA), the lead State agency for coordinating emergency responses. PEMA has the responsibility of initiating through County officials warning signals to the public as well as messages of instructions on actions to be undertaken. Alerting the citizenry to the existence of a serious incident occurring at a facility is accomplished through activating a system of sirens installed by the Applicant throughout the plume exposure pathway, EPZ. Siren tones are designed to alert the public to the communication of television and radio emergency broadcast messages. A supplemental notification activity in the twenty-seven (27) municipalities within the zone is planned for those who might fail, due to hearing defects or other difficulties, to receive the emergency messages. (Board Finding 53)

In meeting the standards of the regulations and the recommended criteria of NUREG-0654, HMM Associates produced an evacuation time estimate study for the Applicants' emergency plan covering the plume exposure pathway, EPZ. It considered all segments of the population — permanent, transient and special facility distributions — and computed evacuation times. It used a highway network for evacuation based on State and local emergency plans and a network computer model which accounts for traffic congestion and route choices during evacuation. The study reviewed evacuation at different time periods and under adverse weather conditions and concluded that evacuation could be accomplished in normal weather in less than six hours and in less than nine during the most severe weather conditions modeled. (Board Findings 55-62.)

Narrow Roads and Adverse Weather Conditions

The Commonwealth of Pennsylvania (Commonwealth or State) contends Applicants' emergency plan, in the absence of written school evacuation plans, cannot provide reasonable assurance that adequate protection measures can and will be taken during a radiological emergency. It recommends in proposed findings that a full power license be denied until a condition is met that such plans are developed. The plan for evacuating school children and other members of the non-auto-owning population call for evacuation to be accomplished by the use of buses, the availability of which, the State contends, depends on written school plans. Such plans are not in existence yet, although PEMA has requested their preparation.

In commenting on these proposed findings, the Applicant and Staff question the legitimacy of this issue as being among the specific deficien-

cies alleged to exist in Applicants' emergency plan by this part of Contention 6. We think otherwise. This not a matter where the Licensing Board is asked to decide a case on a theory different from the one on which it was tried. Niagara Mohawk Power Co. (Nine Mile Point Nuclear Station, Unit 2), ALAB-264, 1 NRC 347, 354 (1977). Here, all parties were put on notice that the school transportation issue was within the boundary of the contention, the testimony of the Commonwealth referred to the subject and Applicants' and Staff's witnesses commented on it extensively. Simply stated, the issue challenges the Applicants' burden of proof that its planning effort has been adequate in providing evacuation for all persons within the plume exposure pathway, EPZ, over narrow roads and under adverse weather conditions. Availability of an adequate number of buses and the time for them to reach schools was assumed by the HMM study, an assumption subject to contradictory testimony. Accordingly, the argument runs that if the availability of an adequate number of buses is not assured, there can be no reliable estimate of time for evacuating this segment of the population and as a consequence, the Applicants' plan is to that extent deficient.

The Applicant and Staff point out that neither the regulations nor criteria guidance establish maximum time allowances for evacuation but merely require the preparation of time estimates. It seems apparent, however, since evacuation is one option during a radiological emergency, that those responsible for making the appropriate choice need to be able to depend, in doing so, on the reliability of the time estimates submitted. We believe the Commonwealth makes an effective request. All parties interrogated on the question — witnesses for the Commonwealth, Staff and Applicants — agreed that written school plans would be preferable prior to operation of the facility. Although there is no specific recommendation in NRC guidelines for written school evacuation plans, there is a guide which calls for written agreements or signatures to verify agreements among local agencies and other support organizations. This would appear to apply to the school plans in question. The Staff's witness indicated that the guidelines in this area were left somewhat general due to the great variations among States and local governments regarding their particular relationships with bus operations and facilities.

Capabilities of Office of Radiological Health

Testimony on this part of Contention 6 was received from witnesses for the Applicants, the Staff and the Commonwealth, none from any of the Intervenor. The witnesses included the Chief of the Division of Envi-

ronmental Radiation who has the responsibility for BRP planning for accidents at nuclear facilities and routine surveillance of environmental radiation, a former Director of PEMA and now a consultant for the Applicants on emergency planning assistance and an emergency specialist employee from FEMA with responsibility for reviewing radiological emergency plans within the State of Pennsylvania.

The functions of the State's Office of Radiological Health were transferred some ten years past to the Bureau of Radiation Protection (BRP). The BRP exercises a major role in responding to radiological incidents. Its basic charter is to provide immediate assessments of such incidents to PEMA and to recommend appropriate protective actions for the State and local governments to implement. The Agency's plans in an emergency call for a prompt and continuing dialogue with Applicants' emergency personnel, evaluation of radiological data provided by the Applicants and subsequent confirmation by off-site monitoring measurements and liaison operations at Applicants' emergency operating facility. It is primarily looked to for making vital recommendations to PEMA concerning matters of evacuation, public information and instruction. The BRP maintains seventeen (17) off-site but in-place monitoring instruments for routine measurements which are a part of a total grouping for reviewing environmental data that includes thirty-five (35) locations belonging to the NRC and sixty (60) to the Applicants. (Board Findings 70 and 71.)

The State's witness was examined extensively by an intervenor and the Board regarding its funding, personnel, equipment and operations. The evidence reflected that there has been a substantial increase in funding for the Office in the past two fiscal years, additional technical people have been hired to complement the scientific expertise on board, a twenty-four hour response capability has been developed and additional radiological monitoring and analytical equipment has been obtained. The representative from FEMA also gave testimony that the resource capability for BRP to respond to an incident at Susquehanna was adequate. (Board Findings 72-78).

Training Deficiencies and Inadequate Radiation Safeguards

Responsibility for training of emergency workers has been assumed by PEMA for off-site activities and for on-site by the Applicants. (Board Finding 80.) Testimony was received on the adequacy of the training efforts of both parties from witnesses for the Applicants, the State and the Staff.

The Applicants' on-site program for emergency workers includes training, maintaining site-specific equipment and interface operations. The training covers, as appropriate, emergency plan overview, dose calculations and projections, protection actions, basic radiation theory, plant layout and access control. In addition to fire, police and ambulance/rescue personnel, relevant training is to be provided for State and local government and hospital complements. In total, Applicants' plans call for training several hundreds of members of various agencies. About two hundred police, fire and ambulance service personnel have already participated in training sessions and it was anticipated that the training program would be completed initially by the end of 1981 with an annual retraining effort being contemplated. The facility's quality assurance organization will monitor implementation of the Applicants' training programs. (Board Findings 81 and 82.)

The Applicants are providing additional equipment on-site to augment response efforts and have developed fire pre-plans covering every section of the plant to expedite fire handling, and to minimize radiation exposure. Radiation protection clothing and equipment, including a thermoluminescent dosimeter for each worker, will be provided and health physics personnel will accompany the workers to assume responsibility for their safety and minimize dangers from radiation hazards. If necessary to counteract radioiodine inhalation, a supply of potassiumiodide will be available for controlled use. (Board Finding 83.)

The off-site training program is a responsibility of PEMA. Annex E of the State's emergency plan lists courses for training by title, target audience (prospective attendees), duration and organization sponsoring the course. The plan also sets out the undertaking of other State, County and facility organizations for training, drills and educational programs. An annual publication by PEMA lists the times and places where the courses will be conducted. FEMA provides some funds for these training sessions and the State's programs are frequently held in various local regions to minimize expenses. (Board Findings 86, 87 and 89.)

The Luzerne County plan lists the number of individuals it will provide for the training sessions provided by State and Federal agencies and the County has also undertaken to provide training for municipal emergency response people and police and fire personnel. In addition to relevant training for radiological emergencies, emergency workers off-site are to be provided with dosimetry as a protective measure to enable them to observe radiation data. (Board Findings 88 and 91.)

Both the Staff and FEMA witness testified to the adequacy of the emergency plans of Applicants, State and local government respectively on training of emergency workers and protections against radiation hazards.

They also affirmed the plans conformity to the recommendations of the guidance of NUREG-0654.

Conclusion

Except for written school plans, the Board finds the emergency plans concerning notification, evacuation, training programs and radiation hazards adequately address the requirements, recommendations and standards of 10 CFR 50.47(b), 10 CFR Part 50, Appendix E and NUREG-0654. The Board finds further that the Bureau of Radiation Protection is able to adequately perform its responsibilities in the event of an accident.

4. Unresolved Generic Safety Issue

The intervenor, ECNP, proposed in Contention 7 to litigate a number of unresolved generic safety issues relevant to the Susquehanna facility. Summary disposition motions filed by the Applicants were granted for those parts of the contention dealing with the pressure suppression containment structure, BWR core spray nozzles and anticipated transients without scram (ATWS) system.

The remaining part of the contention questioned whether the problem of stress corrosion cracking in the stainless steel piping of the reactor had been solved. This problem, which has been known to industry and the NRC for several years, is one of a number of unresolved generic safety issues; so-called because of the difficulty of their absolute resolution. Absent such absolute resolution, it is necessary to demonstrate that even though not completely understood, sufficient measures are taken to assure that the phenomena do not constitute any undue risk either to the reactor or to the public.

Conditions for Cracking

In the instant case, a great deal of information has been obtained through analytical, field and laboratory efforts by both the NRC staff and industry on the causes of and solutions to the cracking problem. It has been determined that for such cracking to occur, three conditions must exist: a susceptible material, a tensile stress in excess of the local yield stress, and the presence of a corrosive atmosphere or medium. Elimination of any one of the conditions should eliminate the problem; elimination of all three, where feasible, is even more desirable.

It was determined early on that cracks occurred generally in areas immediately adjacent to welds (the heat-affected zone, or HAZ). This led to a determination that the welding process in 304 stainless steel, in itself could produce sensitization and high levels of residual stress. Other very high stress levels could be avoided by designing systems to ASME Code requirements but the HAZ problem required special treatment. (Board Findings 97-99.)

Solutions for Cracking Problem

A number of methods have been determined to be effective in either eliminating this cracking problem or rendering it insignificant. Solution heat treatment can be used for shop piping erections. Another method can be used in field fabrication — a technique known as induction heating stress improvement. Use of high-ferrite, low-carbon stainless steel weld metal as cladding is effective. Use of weld metal with high ferrite content and use of low-carbon stainless steel piping is also effective.

All of the above methods, where feasible, have been used in the Susquehanna system. In addition, augmented inspection of welds in the reactor coolant boundary not replaced with corrosion-resistant metal will be performed. The reactor coolant itself will be deaerated so that free oxygen levels are very low, thus reducing the corrosiveness of the water. (Board findings 100-102.)

Finally, it is well documented, both experimentally and through experience, that austenitic stainless steel is highly ductile and not subject to sudden fracture. If a crack should develop in a pipe, it will leak before it breaks or before the crack propagates. A sensitive leak detection system has been installed in the Susquehanna plant to detect such leaks, in conjunction with detection of temperature and pressure changes and drain pump activities. The combination of augmented in-service inspection and leak detection instruments make it highly unlikely that any cracking will not be detected and corrected before any pipe rupture might occur. (Board findings 109-112.)

Conclusion

Based on the uncontroverted evidence in the record, the Board finds that, contrary to the allegation of the contention, stress corrosion cracking of stainless steel piping in coolant water environments is a well understood phenomenon; that adequate measures have been taken by the Applicants in

accordance with NRC Staff guidance in NUREG-0313 to prevent or avoid the occurrence of such cracking at Susquehanna and that in the event such cracking were to occur, there is a high likelihood that it would be detected prior to the development of any significant safety hazard.

5. Decommissioning

Intervenors in Contention 9 attempt to discredit the validity of Applicants' costs for decommissioning. Basically their argument contends that the costs of decommissioning will equal at least the facility's construction cost and that charges for environmental hazards associated with decommissioning, particularly for workers, have not been reflected in its estimates. Intervenors argue that when these costs are properly assessed, they will tilt the cost-benefit balance against operating the facility and that the Applicants are not financially qualified to assume the decommissioning costs.

The process of decommissioning is one whereby, at the end of the plant's useful life, any residual radioactivity level is low enough to allow unrestricted use of the site. To date, three methods have been used: immediate dismantlement, safe storage followed by deferred dismantlement, and entombment, with immediate dismantlement being the most expensive. (Board Findings 115-116.)

Although conceding the fact that no plant of the size of the Susquehanna facility has been decommissioned and actual expenditures for such an undertaking are therefore not available, the Applicants' evidence demonstrates that the tasks associated with decommissioning or dismantling a nuclear facility are a series of straightforward and relatively uncomplicated projects which are subject to accurate costs estimates. (Board Finding 117.)

Costs of Decommissioning

Applicants calculated the cost of decommissioning using the results of a Commission-funded study done by the Pacific Northwest Laboratory (PNL) of the Battelle Memorial Institute. With suitable adjustments for specific reference plants, the total cost of immediate dismantling of both Susquehanna units was put at \$191 million (1980 dollars). The Staff performed a similar but independent calculation using somewhat different assumptions, and arrived at a cost of \$157 million (1980 dollars).

To further substantiate the validity of these estimates, results from actual decommissionings were used, particularly that of the Elk River reactor. To ensure that immediate dismantlement was the most expensive mode, cost estimates using the PNL study were made on the other methods. (Board Findings 122-124.)

In challenging the accuracy of Applicants' decommissioning costs, Interveners questioned the substantial construction costs increases since the facility's license permit was issued in 1973 and the unescalated amount provided by the Applicants for decommissioning. The Applicants' witnesses stated there had not been a substantial increase in dismantling costs over the years and indicated that future inflationary increases in decommissioning costs were not included because of a State's Public Utility Commission (PUC) requirement that such costs be reflected in terms of current dollars.

Radiation Hazards

A substantial amount of cross-examination was concerned with radiation hazards facing workers during plant decommissioning. The PNL study included methods for estimating the radiological effects of decommissioning both to workers and the general public. For workers, the estimates were 3,690 man-rem for immediate dismantlement, 776 man-rem for safe storage and deferred dismantlement, and 3,146 man-rem for entombment. These amounts are on the order of, or less than would be received under normal operation of the plant, and within allowable Commission limits for worker exposure. (Board Findings 126-127.)

For the general public, the estimate for the 50-year radiation dose equivalent to the lung per unit for the maximum exposed individual are 0.041 mrem for immediate dismantlement, 0.0031 mrem for safe storage, and less than 0.038 mrem for entombment. Population doses for a population of 3.5 million within a 50 mile radius of the site are 0.05 man-rem, 3×10^{-4} man-rem, and 0.04 man-rem, respectively, for immediate dismantlement, safe storage and entombment. Therefore, decommissioning should present no serious radiation hazards to either the workers or the general public. (Board Finding 128.)

The PNL Study reached its results, which have not been substantially criticized, by using examples of actual experience gained in various decommissionings, the use of carefully planned work procedures where possible, and the use of routine facility radioactive containment source terms based on acceptable modeling procedures. The study, in considering such contamination at a generic facility comparable to Susquehanna, includes an analysis where the contaminants were increased by a factor of three (3). It concluded that with proper remote procedures being utilized, decommissioning could take place without a significant increase in the occupational radiation dose. The PNL study has been used in the Staff's generic environmental impact study on nuclear facility decommissioning, NUREG-0586, January 1981, (Feldman, ff. Tr. 1344 at pp. 4-5).

Conclusion

On the basis of uncontroverted evidence in the record, we find, contrary to the allegations in the contention, that the health cost and monetary cost of decommissioning the Susuehanna facility have been adequately assessed and that these costs when added to other monetary and health costs will not tilt the cost benefit balance against authorizing operation of the facility.*

6. On-Site Storage of Radioactive Waste

Contention 11 alleges the Applicants fail to meet Commission's standards for on-site storage of low-level radioactive wastes to provide safe storage of such waste for up to 10 to 15 years, and creating thereby an unreasonable risk to petitioners. Inasmuch as the regulations do not specify the amount of space to be provided, nor any definite length of time for storage, we cannot find the Commission's rules have been violated. We do, however, consider whether Applicants' proposed facility presents an undue risk to the health and safety of the public.

Applicants intend to ship all low-level radioactive wastes (LLRW) generated by the facility to a commercial disposal site, but believe that it is prudent to build a LLRW facility for on-site storage in case off-site disposal is not available. Applicants do believe, however, that such off-site disposal will be available. (Board finding 132.)

The low-level radioactive waste holding facility (LLRWHF) is a reinforced concrete vault, meets the applicable seismic and flooding criteria, and can withstand tornado force winds, though not necessarily tornado induced missiles. It has a design life of 40 years, and if necessary, can accommodate the LLRW generated in four years of two-unit operation. Process wastes will be stored in solidified form; contaminated trash will be stored in 55-gallon steel drums. (Board Findings 133 and 134.)

Radiation Dose Exposure

The facility is designed to minimize exposure to operating personnel, and it is expected that worker exposure will be well within 10 CFR Part 20 and 40 CFR Part 190 limits. (Board Finding 140).

An analysis of expected radiation dose received by an individual at the site boundary, assuming maximum radiation levels in the waste, with the

* See fn. p. 824, Findings on Decommissioning, INFRA.

facility completely full of waste and the continuous presence of the individual for one year, showed a dose of 1.1 mrem would be sustained under such conditions. This is well within 10 CFR Part 20 limits. A study of potential accidents at the LLRWHF shows that resulting radiation levels would be a small fraction of 10 CFR Part 100 guidelines. (Board Finding 141 and 142).

Conclusion

Based on the uncontroverted evidence in the record, the Board finds that the Applicants' proposed LLRW storage plan does not present an unreasonable risk to the health and safety of the public under either normal operation or hypothetical accident conditions. Accordingly, we find the Applicants have provided adequately for safe on-site storage of low-level wastes.

7. Health Effects of Electric Fields

The 500 kV transmission lines serving Susquehanna will produce a calculated maximum electric field of 11 kV/m at the ground level at the point of minimum clearance on the right-of-way and 2.28 kV/m at the edge of the right-of-way. It is alleged by Contention 17 that these electrostatic fields will be harmful to living organisms in the vicinity of the transmission lines. (Board Findings 144-145.)

Testimony was presented concerning epidemiological studies of workers exposed to electric fields, experimental exposure of human subjects and test animals to electric fields, and theoretical analyses of the potential effects of exposure to electric fields.

Applicants presented prepared testimony concerning an extensive review and analysis of the literature concerning effects of electrostatic fields. This review was further elaborated in redirect examination. Staff presented a similar and generally consistent review and analysis with the addition of information from some on-going studies. Intervenors relied primarily on information from a case before the New York State Public Service Commission in 1976-78.

Epidemiological Studies

Several studies were cited from the United States and Europe of workers in the electric power industry. Populations exposed and unexposed to electric fields showed no differences in indicators used. The indicators

used varied among the studies, and included such factors as state of health, physical, mental, or emotional characteristics, medical visits and druggists bills. (Board Finding 148.)

Experimental Studies

In several experimental studies involving human subjects where they were exposed to 12 kV/m or higher electric fields, there were no detrimental effects. (Board Finding 151.) Various test animals have been exposed to electrostatic fields, including mice, rats, monkeys, and swine. The preponderance of evidence indicates that test animals exposed to electric fields of up to 100 kV/m do not experience significant harmful health effects. (Board Finding 152.) Some results indicate physiological and/or behavioral responses. These were criticized because they have poor experimental design or poor control of experiments, fail to be reproducible, are not statistically significant, have internally inconsistent results, experienced concurrent interfering factors (such as a disease outbreak among test animals), and lack of hazard significance. (Board Finding 156.) Responses to questions, however, reveal that some of the tests that showed no significant effects had such small numbers of test animals that they, too, were not statistically significant, for example tests using monkeys.

There is ongoing research funded by the Department of Energy on transmission line effects. It is guided by an Interagency Advisory Committee on Electric Field Effects. Thus far, some statistically significant effects have been observed in mice and rats exposed to field strengths of 4-20 kV/m. These effects are so subtle and small in magnitude, however, that further research is needed to determine if they have any biological significance. The levels of long term exposure to the general population from Susquehanna lines would be less than 2 kV/m, well below these values where effects have been observed in these studies. (Board Finding 159.)

Theoretical Evidence

Theoretical evidence suggests that currents produced within the body by Susquehanna lines could be on the order of 0.1 to 1 milliamperes per square meter. These are well below the level of perception. They cannot produce sufficient heating of tissues or molecular polarization or deformation to cause significant biological effects. (Michelson, ff. Tr. 1046 at p. 6.)

While some writers have postulated behavioral and central nervous system modification from such exposures, a mechanism to cause these

effects is unknown. The Board found Applicants' witness, Dr. Michaelson, to be thoroughly familiar with the pertinent scientific studies and capable of making judgments as to their validity and significance and the Staff witness, Mr. Gears, generally corroborated Dr. Michaelson's testimony. The intervenors witness, Mr. Amory, relied primarily on the record of a hearing before the New York State Public Service Commission for his direct case and to discredit Dr. Michaelson's credibility. The Board notes the New York State Public Service Commission found in favor of a position contrary to that cited by Mr. Amory.

Analysis of Tests

The Board notes that high voltage electric fields have been shown to produce some effects in test animals although some studies may be ruled out because of poor experimental design or lack of statistical significance. However, there remain some valid studies that appear to show statistically significant effects. The question is do these effects have any biological significance for the test animals and, in turn, people. The Board adopts Dr. Michaelson's position that there can be a stimulus from an electric field that causes a measurable effect without this effect necessarily being considered adverse or hazardous to the health of test animals or people. Because of the judgment involved in determining hazard, interpretations may be controversial. The Board concurs with the Staff's witness, Mr. Gears, that where results vary, effects are small and subtle, the applicability to field conditions questionable, and human effects speculative, the preponderance of evidence has to be considered.

The Board finds the epidemiological evidence to be convincing that no harmful effects to the general population are anticipated as a result of exposure to the Susquehanna lines. Human experiments, theoretical explorations and animal experiments support this conclusion. Some tests do show results that could be interpreted as adverse, but these are so flawed that the results are inconclusive. Valid ongoing tests have not shown effects at the levels produced by Susquehanna lines, although there have been some observations at higher levels that require further research to define their significance from a biological standpoint.

The Susquehanna lines would meet the only standards known to exist, namely Soviet standards. The Soviets have established standards that limit electric fields to 12 kV/m at points where lines cross roads and 15 kV/m elsewhere along unpopulated sections. (Board Findings 150, 160.) The Applicants have stated that they would take steps, if necessary, to limit exposures at ground level at highway crossings to 7.5 kV/m. (Board Findings 157.)

The Board recognizes the Applicant's hesitancy to put conclusions in absolute terms. It is difficult, if not impossible, to prove a null hypothesis. However, where current research results tend to be negative, the Board believes this is a reasonable factual basis for decision. Should future research find positive results, appropriate action may and can be taken at that time.

Conclusion

The Board finds that the epidemiological evidence indicates that the electric fields to be generated by the Susquehanna 500 kV transmission lines will not cause adverse health effects to people, and the preponderance of the evidence reflects that there will be no adverse effects to animals, plants or people. Accordingly, there is no basis for requiring a modification in the transmission lines or its right-of-way.

8. State and County Emergency Planning

Contention 20 was sponsored by the Susquehanna Environmental Advocates (SEA) and was based on drafts of State and County emergency plans filed before 1981. As accepted for litigation, however, its allegations were evaluated against the plans currently under review: the State plan of February 1981 and the plan of Luzerne County of August 20, 1981. (Swiren, ff. Tr. 2671 at p. 3); also see SEA motion for allowance of new contentions dated May 6, 1981 and Board Order of July 7, 1981.) Testimony was submitted by the Applicants, the Staff and the Commonwealth of Pennsylvania and the Board also sponsored two witnesses from Luzerne County. None of the Intervenors offered direct testimony. Exhibits were accepted into evidence from the Staff and the Commonwealth and are referred to, as appropriate, in the findings of fact.

Several developments relating to emergency planning occurred during the evidentiary hearing and deserve comment here. The first involved Intervenor CAND's withdrawal from participation in the consideration of Contentions 6 and 20 on grounds that the emergency plan of Columbia County, which was not placed in evidence, was a necessary ingredient to litigating these contentions. Part of that County is within the plume exposure pathway, EPZ. Commission regulation and guidance on emergency planning contemplate the integration and coordination of the Applicants, State and local government plans but deficiencies in plans must, for purposes of addressing such controversies in a hearing forum, be specifically alleged. Here, Contention 6 involves the Applicants' plan and Contention 20 is concerned with shortcomings in the plans of State and

Luzerne County. Columbia County's plan was not in issue. It should also be noted that there was testimony that Columbia County's draft plan was in the same state of completion as Luzerne County's and the plan was made available to all parties prior to the evidentiary proceeding.

The second development concerns a motion made by SEA and denied by the Board, to keep the record of the proceeding open until the governments emergency plans were completed. At the time of the evidentiary hearing, neither the State nor Luzerne County plan had been submitted to FEMA for final review. The Intervenor was advised that outside of issues raised sua sponte, Licensing Boards are restricted to adjudicating only those matters raised by the contentions. See 10 CFR 2.760a. A decision as to any other matters which need to be considered prior to issuance of an operating license is the responsibility of the NRC Staff. *Consolidated Edison Co. of N.Y., Inc.* (Indian Point Nuclear Generating Station, Units 1, 2 and 3) ALAB-319, 3 NRC 188, 190 (1976).

Based on evidence submitted on the plans as they existed at the time of the hearing, the Intervenor failed to demonstrate to the Board that completion of the emergency plans was essential to consideration of those inadequacies alleged in Contention 20.

During the hearing, there was substantial cross examination participated in by various representatives of SEA, and by Counsel for the State, the Applicant and the Staff as well as members of the Board. The findings of fact, *infra*, cover each section of NUREG-0654 which the contention challenges as being ignored or not complied with by the emergency plans of the State or County (Luzerne) or both. Here, we discuss our resolution of those issues which received material discussion in the proceeding.

Communication of Information

Questions were raised in the hearing whether the State and Luzerne County plans conformed to the recommended criteria on information that was to be made available to the permanent and transient adult population within the plume exposure pathway EPZ. Doubts were raised over the subject matter, its method of delivery, the obligation for costs of printing and distribution and the time period that such information should be in possession of those who were to receive it. The thrust of these inquiries challenge the adequacy of planning for public information which is required to meet the standards of the regulations that call for making vital information available to the public on a periodic basis. The Commonwealth of Pennsylvania has suggested in proposed findings that absent a pre-emergency dissemination of public information, there should be no finding

as is required by the regulation of reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

However, testimony at the hearing provides relevant and acceptable responses to the issues raised in this regard. (See Hearing Transcript pp. 2547-55, 2605-07, 2616-18, 2627-33, 2674.) There was a clear demonstration that the State and County had given extensive consideration to their public information responsibilities. What was not as obvious, however, is the complementary relationship important to a proper exercise of those responsibilities. Although the public information guidance of NUREG-0654 reflects that the recommended criteria are applicable to State and local governments, as they are to the nuclear facility organization as well, we do not conclude that this calls for duplication in effort or programs. One of the fundamental principles of NUREG-0654, as we see it, is the integrated development of emergency response plans. (See NUREG-0654 FEMA-REP-1 Rev. 1, pp. 23-24). This integration was recognized, in part, by PEMA's own public information officer who testified that the public information responsibilities were a joint and cooperative responsibility of the State, the County and utility. (Comey, Tr. p. 2628.)

A consideration of all the testimony makes evident the respective sharing of these obligations. The plans for public information contemplate the publication of printed information containing, among other items, material on radiation and evacuation routes to be distributed by means of brochures and possibly telephone directories to members of the permanent and adult transient population. Although no decision had been made, the Applicants' major witness expressed an opinion, that, following a similar undertaking at the Three Mile Island Facility, the Applicant would assume responsibility for financing the public information costs. This possibility is reinforced to a degree by suggestions of assistance contained in the funding and technical assistance section of the federal guidance. (NUREG-0654, p. 25.)

With respect to the necessity of implementing public information prior to the facility's operation, we subscribe to its accomplishment but fail to comprehend the Commonwealth's concern. This is particularly so where, as here, FEMA's representative (a major reviewing factor in the Applicants' effort to obtain a license) testified that such information should be distributed prior to the plant's operation. Since all parties, concur in this aspect of the program for informing the public, we can reliably assume it will materialize as expected. Accordingly, no justification exists for the condition requested by the State.

Traffic Control

Arguably, no more critical item in emergency planning exists than that which deals with the movement of people and vehicles during an evacuation. Traffic control raises issues of policing the activity, the manpower forces assigned to it and the manner in which they are expected to operate. Contention 20(2)(d) alleges that the Luzerne County plan provides an outline for traffic control under "Police group" and does not list the units to be available for the operation.

The County plan places responsibility for the execution of traffic control plans on the Luzerne County Police Group chief, in cooperation with the Pennsylvania State police and municipal police forces. In the evacuation highway network, a number of access control and traffic control points have been identified and designated to be controlled by the State Police. (Board Finding 173.) The State Police Traffic Control Plan, which is referenced in the County's plan, proposes the availability of 200 State Police officers to man such points and backup assistance is to be provided by the Pennsylvania National Guard. Municipal police are obligated to assure the flow of traffic within their municipalities. The review by FEMA of these plans indicates that the County plan needs additional specification in the allocation of State police manpower for access and traffic control points and also the manner in which local police resources are to be utilized. We concur as due to its unique level of importance, proper planning in traffic control for evacuating an area of over 50,000 people requires precise operations. To that extent, the potential for problems is minimized and the proper development of the range of protective responses recommended by NUREG-0654 is assured. (See Hearing Transcript, pp. 2679-83.)

Notification to the Public

An essential element in planning for radiological emergencies is the development of a procedure for notification of such an incident to members of the public. Both the Commission's standards and criteria require the establishment of means to provide for both early notification and clear instructions. The method for accomplishing this in connection with an emergency at the Susquehanna facility is through the initiation of a system of sirens covering most and eventually all of the plume exposure pathway area. The siren warnings are designed to lead people to turn to television and radio sets for the reception of appropriate messages of instruction through an emergency broadcast system. (Board Finding 176.)

Under the County's response plan, municipal officials are designated as being responsible for insuring the receipt of warning information to the resident and transient population, as well as industries and institutions, within the municipalities' boundaries. The method proposed for performing this responsibility is through a door-to-door type procedure using speech amplification equipment. Contention 20(3)(a) questions the procedures on the basis that details for its execution are missing in the plan and letters of agreement with political subdivisions to assume responsibility for door-to-door notification are not in existence.

Although the County plan calls for utilization of municipal police and fire departments to carry out the notification procedure, there is testimony to the effect that such a warning program is viewed as only a backup to the siren system and that a backup notification procedure is not required. We do not agree. The fundamental obligation of a warning notification system is communication to all segments of the public. By definition, this covers individual with hearing impairment and those who for a variety of causes fail to hear siren signals as for example, due to surrounding noise conditions or certain sleeping environments. We do not see such a notification procedure in terms of a backup except in a circumstance where a breakdown of the siren system has occurred. We must conclude — and we believe this to be the plan's intent — that the notification program within municipalities is not only a supplement but an integral part of the warning system for disseminating appropriate information to the public as recommended by the regulations. That being so, this part of the notification procedure must be contained within the plan before operation, to the same degree as is required of the siren system itself. (See Commonwealth Ex. No. 9, Annex C; also Swiren ff. Tr. 2671 at p. 10.)

School District and Municipality Plans

There was substantial disagreement in this proceeding, as we indicated earlier, over the issue of transportation (availability of buses) to handle the evacuation needs of school children and other non-auto owning members of the population. The State's witnesses indicated that the availability of an adequate number of buses for this purpose could not be ascertained until written school emergency response plans were completed. Acknowledging the need for such plans, witnesses for the Applicant and Staff nevertheless subscribed to a belief that operation of the Susquehanna facility could proceed without them. The foundation for those judgments rested on the experience already accumulated by school districts in handling early school departures during snow storms and other conditions of inclement weather.

Additionally, the view was expressed that other nuclear facilities were operating without apparent difficulty within the State in the absence of written school plans. The implication here, presumably, is that imposing a condition for such plans at the Susquehanna plant would represent unfair and inequitable treatment.

An additional aspect of this controversy relates to the current status of municipal emergency response plans. In addition to the provision for evacuating all school children by bus, the County plan calls for the evacuation of non-auto owning persons by bus from selected pick-up points in various municipalities. The identification of transportation needs and pick-up points is a municipal responsibility under the County plan. However, neither of these objectives are capable of accomplishment since all municipal plans have not been developed to this point. Although the testimony is conflicting on the question of whether an adequate number of buses exists to evacuate school children without a return trip, it is clear that resolution of this matter and therefore the availability of buses for both groups cannot be resolved without prepared school plans which will define and disclose school requirements. (Board Finding 185.)

Written School Plans

In our prior comments here, we concluded that written school plans were a necessity. We support that judgment with our belief that completion of municipal emergency plans must also be assured prior to operation of the facility. When several large groups of individuals depend for evacuation purposes on a single source of transportation, it would be difficult to determine in the light of the present status of planning that there is a reasonable assurance that adequate protective measures in this area can and will be taken in the event of a radiological emergency. The fact that PEMA has encouraged the dispatch of letters to all district school Superintendents to facilitate the preparation of such plans and the fact that most municipalities have completed their planning up to this point are considerations that suggest the planning efforts in both area will be completed in the near future. If the opinion of the majority of witnesses that support this conclusion is correct, no harm will result from our protective rendering here.

Availability of Dosimeters

The Commonwealth has requested the Applicants' operating license be made subject to an NRC finding that an adequate number of dosimeters

are available for distribution to off-site emergency workers. There is no disagreement that State and County plans require these workers be equipped with three dosimeters, two self-reading and a third, a thermoluminescent (TLD) type or that the State's supply is inadequate. Nor is there substantive disagreement that federal guidance only recommends a requirement for emergency workers to have two dosimeters — one self-reading and the other a TLD. The dispute centers instead on the question of whether the federal government has the responsibility to furnish the necessary equipment. Unfortunately, that dispute cannot be resolved here since it presents a matter beyond our domain. In operating license proceedings, a hearing Board's jurisdiction is limited to the issues placed in controversy by the parties and to matters raised sua sponte by the Board. 10 CFR Part 2, Appendix A, VIII(b). The question of responsibility for supplying dosimeters cannot, as the State argues in its proposed findings, be considered as within the boundary of Contentions 20(5b) or 20(8)(a) although those contentions do, in fact, relate to such equipment. Even though a State's position in Commission proceedings is a protected one and its participation is unfettered by many requirements imposed on other parties, it must observe, nevertheless, the same procedural necessities applicable to other participants. This includes advancing issues it wants litigated in such a time framework that opposing parties will be able to respond in a meaningful manner. See *Gulf States Utilities Company (River Bend Station, Units 1 and 2) ALAB-444, 6 NRC 760, 768 (1977)*. Here, the State did not advance the dosimetry matter in its responses of August 10 and October 5, 1981 in complying with our request for the Commonwealth to delineate its concerns. It was only during cross examination of FEMA's representatives during the evidentiary proceeding that the State first raised the dosimetry issue to the status of controversy. However, that is too late for either the parties' or the Board's consideration.

Reception and Mass Care Centers

SEA's contention 20(7)(e) invites some confusion due to changes in name designations in State and County plans of relocation centers as reception centers, host areas counties or areas and shelter areas as mass care centers. The criteria of NUREG-0654 propose that relocation (reception) centers and shelter areas (support mass care centers) be located on maps with evacuation routing as part of the emergency plans of State and local governments to implement protective response measures. Four support counties are listed in the Luzerne County plan but their response plans, required by the State, have not been finalized. Accordingly, the

mass care facilities which are to be located partly in these areas have not been identified as yet. As a result of this status of things, the County plan currently identifies the location of reception centers but only those mass care centers located within Luzerne County. The Luzerne County plan reflects that reception centers are considered as pass-through facilities where evacuees merely obtain information and directions to mass care facilities. The County has entered into a written memorandum of understanding with local chapters of the American Red Cross through which these organizations have undertaken to handle the mass care centers in the event an emergency requires their utilization. (Board Finding 188.)

Traffic Congestion

Questions were raised in the proceeding concerning a lack of identification in State or County plans of traffic impediments on evacuation routes and their failure to deal with such restrictions by not including contingency measures. As we indicated in our comments on Contention 6, the time estimate evacuation study performed by HMM Associates utilized a computer model which was designed to allow for traffic congestion. The highway network used in the study was also physically inspected for problem areas. To control the flow of traffic in an evacuation operation, the State and local plans recognize the basic responsibility of the State Police who will man both traffic access points and previously designated traffic control points where bottlenecks to traffic flow would normally occur. As an aid in assisting in the elimination of impediments, the State Department of Transportation is charged with removing obstacles to the flow of traffic and the Pennsylvania National Guard is also given an assignment of complementing duties. This array of manpower should be adequate to the success of this mission if the need should arise, as well as the handling of traffic if the traffic light system through a loss of power ceases functioning. This latter possibility was suggested by intervenors during the hearing.

Ingestion Exposure Pathway

An allegation concerning the ingestion exposure pathway (fifty mile radius around a nuclear facility) raises questions regarding the State's plan to comply with the recommendation of NUREG-0654, J. 11. In essence, the criticism was made that the plan fails to (1) identify procedures for detecting contamination; (2) identify procedures for imposing protective

action measures such as impoundment, decontamination, processing, decay, product diversion and preservation; (3) mention maintenance of maps for recording data on surveys and monitoring, land uses, dairies, food processing plants, watersheds and facilities, crop information, and (4) include up-to-date lists of milk and food processors or products originating within the ingestion zone but located elsewhere. The State's plan for handling protection responses in the ingestion pathway involves the coordinated activity of a number of State agencies, principally the Department of Agriculture, the Department of Health and the Department of Environmental Protection with its key office, referred to earlier, the Bureau of Radiation Protection (BRP). Simply stated here, samples of milk, produce, and water are to be tested for contamination and responses to protect the public's food supply and water are then recommended to PEMA.

The BRP plan includes protective action guides (PAG) for food, milk and water by which levels of contamination are correlated with protective responses and protective action options are included in the Department of Agriculture's plan. Currently, the State's plan for the ingestion exposure pathway is being revised and a complete appendix will be published providing a detailed specification of governmental responsibilities in this area including the establishment of means to protect the public from contaminated food and water and to provide guidance to farmers for protection of livestock and harvested crops. Maps have been prepared for the purpose of recording essential information and data on land uses and crop information and up-to-date lists of processors of food, agricultural items and milk products originating in the ingestion pathway are obtainable.

Medical Services

In contention 20(9)(a and b), SEA challenged the adequacy of State and County plans on the arrangements made for medical services for contaminated individuals. NUREG-0654 L. 1 and L. 3 recommends that lists of hospitals be compiled which are considered capable of providing such medical support and also that arrangements be made for local and backup hospitals and medical services that can provide radiation exposure evaluation and handling of contaminated individuals. The State plans lists all hospitals within the State having 'radiation treatment capability' and the Luzerne plan lists such hospitals in the area surrounding the Susquehanna facility, citing some as support hospitals and others as back-up support. (Board Finding 194.) The state plan indicates that a list of site specific and back-up hospitals for the plan was being developed. We would

assume that these designations when finally developed will have met in a meaningful manner the criteria of NUREG-0654 L.1 so the "arrangements" with those hospitals for the required support would have been concluded as a result.

Conclusion

Based on the evidence of record, the Board finds that contrary to the Intervenor's contention, the emergency response plans of the Commonwealth of Pennsylvania and Luzerne County, except as they fail to assure the availability of plans from Municipalities and School Districts, are in substantial conformance to the recommendations and guidance of NUREG-0654. The Board finds further that those planning areas requiring further development will be addressed over the next several months. The deficiencies in the plans concerning Municipalities and School Districts will be addressed in the Board's Order herein.

9. Scram Discharge Volume Break

Contention 21, sponsored by both the Susquehanna Environmental Advocates and the Citizens Against Nuclear Dangers, alleges that a break in the scram discharge volume (SDV) will release radioactive water which can disable the major safety cooling systems in a brief period of time. This would result from the released water flowing into the reactor basement where the cooling system pumps are located, thus flooding and rendering them inoperative.

The SDV is basically a tank which receives reactor coolant displaced by insertion of the reactor control rods. The Coolant enters the SDV through the scram exhaust valves, which open upon receipt of a scram signal and close when the scram is reset. Scram reset also opens the SDV vent and drain valves which are closed upon receipt of a scram signal. The contained coolant is then discharged to the building sump, and the SDV is thus prepared for the next scram actuation. A break in the SDV with the scram exhaust valves open would result in release to the building of water at reactor temperature and pressure. (Board Finding 204.)

Staff Evaluation

The Staff has evaluated this problem generically and has issued its findings in NUREG-0803. It identifies three general areas of concern:

integrity of the SDV piping; emergency procedures to successfully mitigate a leak or break; and the environmental qualification of equipment needed to detect and mitigate the consequence of an SDV break. It also proposes a series of site-specific recommendations to which Applicants have committed themselves. (Board Finding 206.)

Probability of SDV Break

The SDV systems are designed and fabricated in accordance with high quality standards, such that they are highly resistant to cracking, fatigue, corrosion, brittle fracture and other failure mechanisms. They are also in-service inspected according to ASME code requirements. Operating experience shows that no SDV leaks or breaks have been reported in 20 years of BWR operation. These factors strongly support an argument that a break in the SDV system is a very low probability occurrence.

SDV System Breaks

If a break in the SDV system should occur, resetting the scram will close the scram exhaust valves, thus terminating the coolant flow to the SDV. If the scram cannot be reset, the leak must be identified and isolated. A leak can be identified by a number of indicators; existence of a leak is therefore not dependent upon a single instrument. The reactor is then depressurized to limit the amount of coolant released to the building and manually operated isolation valves are utilized to stop any further leakage. (Board Finding 209 and 211.) While a radiological field of some strength will exist in the building, appropriately equipped personnel will be able to enter the containment to close the isolation valves without exceeding 10 CFR Part 20 dose limits. (Board Finding 212.)

Adequate core cooling must be maintained during this period. While the system is pressurized, the main feedwater pumps, the condensate pumps and the condenser will be used. These are located in the turbine building and are not subject to flooding. When the system is depressurized, the residual heat removal (RHR) system provides low-pressure coolant injection. If the RHR pumps, which are located in the reactor basement, should be flooded, the RHR service water pumps, which are located in the emergency service water pumphouse and not subject to flooding, can deliver water directly from a 25 million gallon spray pond. (Board Findings 213-214.)

At Susquehanna, all of the emergency systems located in the reactor basement are in compartments which are watertight with respect to each other. The stairwells are also equipped with watertight doors. The basement sump pump should also remain in service. However, even if all these measures were defeated, it would take several hours to flood the basement to a one foot depth. Inasmuch as all motors driving emergency core cooling system pumps are six feet above the basement floor, loss of these motors would not occur until many hours after the onset of the accident, if at all. (Board Findings 218-220.)

Conclusion

On the basis of the uncontroverted evidence in the record, we find that a break in the scram discharge volume of the control rod drive system is unlikely and that if such a break should occur, its consequences could be mitigated before major safety systems would be damaged. Accordingly, we find that contrary to the allegations of the contention, a break in the scram discharge volume of the Susquehanna facility cannot disable major safety systems.

The matters examined during the evidentiary hearing which are not discussed in this Opinion were considered by the Board and found either to be without merit or not to affect our decision herein. Findings of fact and conclusions of law which are annexed hereto are incorporated in the Opinion. In preparing its findings of fact and conclusions of law, the Board reviewed and considered the entire record and the findings of fact and conclusions of law proposed by the parties.⁸ Those proposed findings not incorporated directly or inferentially in this Initial Decision are rejected as being unsupported by the record of the case or as being unnecessary to the rendering of this decision.

Accordingly, for all the foregoing reasons it is this date April 12, 1982 ordered that the Director of Nuclear Reactor Regulation is authorized to issue operating license to the Applicants for Units 1 and 2 at the Susquehanna Steam Electric Station, subject to the conditions being complied with as stated.

⁸ Proposed findings were submitted on all contentions by the Applicant and Staff; on Contentions 6 and 20 by the Commonwealth and on Contention 1 by ECNP. No other party filed proposed findings.

FINDINGS OF FACT

III. CONTENTIONS

Health Effects of Nuclear Fuel Cycle (Contention 1)

1. This contention was modified by the Board on March 27, 1980, to treat technetium-99 (Tc-99) similarly to radon-222, following the Commission's amendment of Table S-3 of 10 CFR §51.20 (44 Fed. Reg. 45362, August 12, 1979).

2. The Applicants, Staff and intervenor ECNP stipulated that a condition will be imposed on operating licenses for the Susquehanna units, making the licenses subject to the outcome of the consolidated radon proceedings currently before the Appeal Board. Except for the quantities and health effects of technetium, and the stipulation regarding radon, the parts of this contention concerned with other isotopes were dismissed by the Board through granting motions for summary disposition filed by the Applicant and Staff.

3. Contention 1, as litigated, reads as follows:⁹

1. The quantity of technetium-99 which will be released from waste management or reproceeding activities resulting from operation of the Susquehanna facility, has not been, but should be adequately assessed. The radiological health effects of technetium should be estimated and these estimates factored into the cost-benefit balance for the operation of the plant.

4. Technetium, which is produced by fission of uranium-235 and by neutron activation of molybdenum-98, has no stable isotopes and is rarely found in nature. Tc-99's half-life is 220,000 years and it decays to stable ruthenium-99 by emitting low energy beta particles. Because of its low beta energy, it poses no significant external exposure hazard, and the potential health hazard associated with Tc-99 is from possible ingestion or inhalation (Englehart, ff. Tr. 1852 at pp. 2-3).

5. During operation, Tc-99 is produced at the rate of 14.3 Ci/MT of uranium or 500 Ci/RRY and essentially all of the isotopes produced by

⁹ Applicants presented testimony of Richard W. Englehart, Ph.D., a Senior Executive Consultant and Manager, Radiological Programs Department, Environmental Service Division, NUS Corporation. The Staff's witnesses were Fred D. Fisher, Ph. D., leader of the Environmental Radiation Emergency Support Section, Uranium Fuel Licensing Branch, Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards, NRC; Dr. Edward F. Branagan, a Radiological Physicist and Dr. R. K. Struckmeyer, an Environmental Analyst in the Radiological Assessment Branch, Office of Nuclear Reactor Regulation. The Intervenors presented no direct testimony.

fission remains in the encapsulated spent fuel. No releases occur in storage at the reactor or in interim storage facilities. (Ibid. p. 3.)

6. Under the once-through fuel cycle (no reprocessing), the stored spent fuel is packaged for ultimate disposal in a stable geologic formation. Containment package integrity for a minimum of 1,000 years is required by the proposed 10 CFR Part 60 with a maximum release rate of one part in 100,000 per year thereafter. For the analysis by Applicants' witness, all of the Tc-99 is assumed to be dissolved in groundwater over a period of 100,000 years. (Ibid. pp. 4-5.)

7. In the uranium-only recycle operation, the spent fuel is dissolved in hot nitric acid forming a non-volatile stable pertechnetate acid and no Tc-99 releases are expected at this stage. The nitric acid solution is subjected to a series of solvent extraction cycles to separate the uranium from the fission products and in this partitioning, over the long term, it is estimated that 8 to 25 percent of the Tc-99 will remain with the uranium product stream with the balance going to the high-level liquid waste (HLLW) stream. The HLLW stream goes to a treatment process and, potentially, to environmental releases. In the uranium-only recycle fuel cycle, there is a separate plutonium waste stream that would contain 1 percent, more or less, of Tc-99, but because of the future uncertainty of plutonium recovery, it was conservatively assumed that the Tc-99 will be apportioned only between the uranium stream and the HLLW stream. (Ibid. pp. 6-7.)

8. In the conversion of the uranium product stream of fuel, some Tc-99 is contained in low-level solid waste (LLW) produced which is buried in a shallow facility. At some future time, some fraction of 40 - 125 Ci/RRY may be available for human intake because of groundwater intrusion and conveyance. (Ibid. p. 10.)

9. In the re-enrichment process, direct emission of Tc-99 to the atmosphere is estimated to be 6.6×10^3 Ci/RRY and to surface water, 8.5×10^2 Ci/RRY. (Ibid. p. 11.)

10. The predominant dose pathway for atmospheric releases of Tc-99 is soil deposition, root uptake, and human ingestion. The pertechnetate ion, which is the most stable chemical form of Tc-99 in aqueous solution, is weakly retained in non-organic soils and strongly retained by organic soils. Consequently, uptake by vegetation is site dependent. For inorganic soils, a conservatively high residence time is one year and for organic soils it would be much longer. For the calculations done by Applicants' witness, an average residence time of 15 years was used and a soil-to-plant transfer factor of 50 pCi/g fresh vegetable weight per pCi/g dry soil weight, both of which are characterized as conservative. (Ibid. pp. 12-13.)

11. Using models and calculations of Roddy, *et al.*, population doses were estimated. However, since Roddy, *et al.*, used a soil-to-plant transfer factor of 0.25 pCi/g instead of 50, Roddy's calculations were scaled up by a factor of 140 to account for the difference in transfer factors. As adjusted, and using a source term of 0.0066 Ci/RRY, annual population doses from atmospheric releases are calculated to be in man-rem/RRY: total body, 6.8×10^{-4} ; bone: 0.0016; kidney: 0.031; and gastrointestinal (GI) tract: 0.134. Annual population thyroid doses based on factors from Killough, *et al.*, are less than 0.1 man-rem/RRY. (Ibid. p. 14.)

12. Doses resulting from surface water releases from enrichment processes are estimated to be in man-rem/RRY; 8.2×10^{-3} total body, 0.12 GI tract, and 0.52 thyroid. (Ibid. p. 15.)

13. A model developed by Adam and Rogers for the Maxey Flats commercial low-level waste disposal facility was used by Applicants' witness for computation of groundwater releases from shallow burial sites. This model assumes a groundwater transport distance of 800 meters to a surface stream. Population doses result downstream from use before the stream reaches the ocean. The Maxey Flats pathway is one of the longest potential fresh water paths of any LLW site in the United States. The exposed population is assumed as 5.7×10^6 . For a shallow land burial of 125 Ci/RRY, calculated annual population doses are in man-rem/RRY; 0.0012 total body, 0.018 GI tract, and 0.077 thyroid, and it is assumed these rates will continue over 10,000 years. (Ibid. pp. 15-17.)

14. Calculations of Tc-99 from high-level waste repositories are based on the NRC proposed technical criteria which after 1,000 years of isolation would restrict the annual release rate to 1×10^{-5} of the inventory (or 0.005 Ci/RRY from an inventory of 500 Ci/RRY). (Ibid. p. 17.)

15. Assuming, very conservatively, that the liquid pathway for deep repositories followed that of shallow burial sites, after 1,000 years of isolation the expected annual population dose would be four-tenths that of shallow sites or a maximum of 0.00048 whole body, 0.0072 GI tract, and 0.0308 thyroid, man-rem/RRY. (Ibid. pp. 17-18.)

16. According to the Applicants' witness, the major potential for population doses from release of Tc-99 would result if this material were to be released to groundwater from waste burial sites or repositories for either spent fuel or reprocessed wastes. It would be expected that such releases would not exceed 10^{-4} of the inventory per year for LLW sites, or 10^{-5} for HLLW sites. Yearly doses resulting from operation of Susquehanna from buried high level wastes based on a once through fuel cycle would be approximately in man-rem: 0.031 whole body, 0.46 GI tract, and 1.97 thyroid. For the uranium-only recycle option, the atmospheric releases over the life of the plant from enrichment process in man-rem are: .043 whole

body, 1.97 kidney, 8.58 GI tract, and 6.4 thyroid; and for surface water releases: 0.52 whole body, 7.7 GI tract, and 33.2 thyroid. The Low Level Waste Storage for the recycle option release to groundwater over 10,000 years results in population doses of in man-rem/year: .077 whole body, 1.15 GI tract, 4.93 thyroid. High Level Waste Storage doses for this option would be the same as for the once-through fuel cycle. (Ibid. pp. 18-19.)

17. The Applicants' witness considers the releases of Tc-99 attributable to Susquehanna to be an insignificant increment to the natural background dose of the affected population. The population dose from natural sources per year is assumed to be 100 millirem per person per year. This would be an annual dose of 570,000 man-rem for a population of 5.7 million downstream from disposal site. From a shallow land burial of the yearly releases of Tc-99 at Susquehanna, the increase per person in an average thyroid dose would be 8.6×10^{-4} mrem, the whole body dose increase would be 1.3×10^{-5} mrem, and from a high level waste repository, the individual dose would be 3.5×10^{-4} mrem, or less than one-thousandth of a percent of the annual dose due to natural background radiation. (Ibid. pp. 20-21.)

18. The Staff's witness, Dr. Fisher, testified on the quantities of Tc-99 releases from the supporting fuel cycle for light-water-cooled reactors. He considered operation without recycle and with recycle of uranium or uranium and plutonium. Using the ORIGEN burn-up code, the witness estimated that 391 Ci of technetium-99 will be contained in the spent fuel from one year of operation of a plant like Susquehanna. In calculating releases from this amount of Tc-99, Dr. Fisher then assumes total and prompt releases (less than 100 years) to surface waters of technetium-99 disposed of with low-level wastes by shallow land burial. For geologic repository disposal, it is assumed waste packaging will retain its integrity for 1000 years, that groundwater required 1000 years to reach surface waters, and that the leach rate of waste form is not more than 0.00001 per year. For reprocessing, the estimates of releases were developed by combining data on the properties of Tc-99 with operating performance characteristics and typical equipment used. Liquid releases associated with spent fuel storage were calculated to be 3.2×10^{-5} Ci/RRY in both cases, i.e., with and without recycle. There are no airborne releases without recycle, but there are with reprocessing. Liquid releases are computed from shallow land burial of low level wastes associated with recycle and the geologic repository for high level wastes in both cases. (Fisher, ff. Tr. 1880 at pp. 1-5.)

19. The testimony of Staff witnesses Branagan and Struckmeyer dealt with the radiological health effects of Tc-99 releases from the fuel cycle.

Doses were computed in three steps and the quantities of Tc-99 released per RRY were taken from Dr. Fisher's testimony. RABGAD and LADIAP computer codes were used to estimate population doses per Ci of Tc-99 to the air and water and the parameters used in codes were taken from the Generic Environmental Statement for Mixed-Oxide Fuels (GESMO), NUREG-0002. Population doses were estimated for 100 years and 1000 years and were estimated per RRY by multiplying the quantities released in gaseous and liquid form by the population doses per Ci of Tc-99 released. Cumulative releases were computed for the first 2000 years and an annual release thereafter. (Branagan and Struckmeyer, ff. Tr. 1894 at pp. 1-3.)

20. Potential health effects were computed by multiplying the population dose per RRY by somatic (i.e., cancer) and genetic risk estimators. The risk estimators used by the Staff were based on the BEIR I Report. These were: about 140 potential deaths from cancer per million person-rem and about 260 potential cases of genetic disorders per million person-rem. The cancer fatality risk estimates are based on the "absolute risk" model in BEIR I rather than the "relative risk" model which would produce higher estimates by a factor of four. The BEIR III Report estimates 1.5 to 2 times as many potential non-fatal as fatal cancers. (Ibid. pp. 4-5.)

21. The total body risk equivalent population dose is about 5 person-rem/RRY for prompt releases. The annual total body risk equivalent population dose is about 4×10^{-3} person-rem/RRY and is about 1000 times less than the total body risk equivalent population dose for the first 2000 years (i.e., 5 person-rem/RRY). The total body risk equivalent population dose for both 100 year and 1000 year environmental dose commitment times are about the same because almost all of the population doses are received in the first 100 years. (Ibid. p. 6.)

22. There may occur about 0.0007 cancer fatalities/RRY due to prompt releases of Tc-99. The number of potential cancer fatalities from each assumed annual release of TC-99 from a high level waste repository for time periods beyond 2000 years (i.e., about 5×10^{-7} potential fatal cancers/yr/RRY) is about 1400 times less than the cumulative value for prompt releases during the first 2000 years (i.e., about 7×10^{-4} potential fatal cancers/RRY). (Ibid. p. 7.)

23. There may occur about 0.00006 genetic disorders/RRY due to prompt releases of Tc-99. The number of potential genetic disorders from each assumed release of TC-99 from the fuel cycle for the time periods beyond 2000 years (i.e., about 2×10^{-8} potential disorders/yr/RRY) is about 3000 times less than the cumulative value for prompt releases during the first 2000 years (i.e., about 6×10^{-5} potential genetic disorders/RRY).

This analysis indicates that the total body risk equivalent dose from TC-99 is about 5 person-rem/RRY. In the FES (p. 4-33), it is stated that the population dose should not exceed 100 person-rem/RRY, a more conservative estimate. (Ibid. p. 7.)

24. The population dose per RRY (i.e., about 5 person-rem, total body risk equivalent) from TC-99 releases from the fuel cycle is about one percent of the population dose (i.e., about 640 person-rem, total body) for the rest of the fuel cycle. Consequently, the radiological impacts from exposure to TC-99 releases from the fuel cycle have an insignificant effect on the cost-benefit balance. (Ibid. p. 9.)

2. Need for Power (Contention 4)

25. As a result of a successful motion for summary disposition filed by the Staff, only the following parts of this contention were considered during the hearing:¹⁰

4. The Susquehanna facility (or, at least, Unit 2 thereof) is not needed, and as a result, the cost-benefit balance is tilted against authorization of operating licenses (or at least, a license for Unit 2), for the following reasons:

a. Information supplied in the Applicants' ER shows that, at the *very low* growth rate scenario, the entire output of both units will be available for sale outside the service areas of the Applicants as the units come on line (ER, Table 1.1-15.)

b. The electric capacity of the lead Applicant in 1977 was 40 percent greater than customer needs and demands from existing facilities. Latest projections of energy use and requirements during the next 30 years for the Applicants' service area, the period equal to the projected plants' "useful life," show that the Applicants can meet the needs of their customers through existing facilities and sources.

26. PP&L prepared a demand forecast in October 1980, which was revised on September 28, 1981. (McNair, ff. Tr. 1957 at p. 1.) The current forecast includes conservation and new technology events likely to occur in the next 20 years. A net reduction of 1000 MW of load is

¹⁰ The Applicants' witnesses, both from the Pennsylvania Power and Light Company were Grayson E. McNair, V.P. Consumer and Community; who testified on the development of sales and peak load forecasts and Wm. F. Hecht, Mgr. of Systems Planning, who testified on the need for energy and capacity from Susquehanna. The Staff's witness was Dr. Raghav Prasad, an economist with the Argonne National Laboratory, who testified on the benefits to be derived from operation of the Susquehanna facility. No intervenor put on direct testimony.

expected from conservation and new energy technologies, and 400 MW from shifting on-peak loads to off-peak.

27. PP&L has forecast loads using econometric models, traditional or judgment methods, probability band forecasts, short-term, and peak load forecasts. The econometric model uses historic values to measure inter-relationships of key variables. Assumptions were developed by Data Resources, Inc. and were used to develop a 25 year macroeconomic outlook. Forecasts of future energy use were made for various components of the residential, commercial and industrial sectors. The DRI forecast selected by PP&L to produce the base case evaluation was called Cyclelong 2005. It assumed a moderate real national output growth for an annual average GNP growth rate of 2.3 percent. The expected values for real annual increases in prices through the year 2000 were 2 percent for coal, 2 percent for oil, and 6 percent for natural gas. The forecast for real electric price increases was -0.2 percent annually. The econometric point estimate forecast for the year 2000 is 35,000 million kWh. Varying real electric price increase from 1 percent to -3 percent and keeping oil and gas constant gives a range from 39,700 GWh to 56,000 GWh. (Ibid. pp. 4-9 and see Graph 1, Rev. 1, p. 11.)

28. The traditional or judgment method of forecasting allows the forecaster a freer hand to employ relationships that cannot be formulated as equations. All factors that would push consumption up are lumped together, whether consistent or not, and then the same is done for factors that would push consumption down. Adjustments are made for conservation, throwover (i.e., substitution of fuel sources), and residential conversions of energy systems. A band forecasts are produced with an upper and lower boundary. The forecasts are based on detailed estimates for various components of the specific sectors. Adjustments are made based on assumptions for economic growth and prices. The results are a forecast of 34,000 GWh to 59,000 GWh. If cogeneration is considered, the range is 27,000 to 54,000. (Ibid. pp. 12-18, and see Graph 2, p. 19.)

29. Long-term judgment forecasting is improved by forming consistent sets of assumptions for estimating most probable outcomes. A refined probability band forecast is developed. This method predicts a continuation of conservation to 1986, followed by an era of throwover from oil and perhaps natural gas to coal and nuclear to 1997. The final three years to 2000 will experience maturation of alternate renewable fuels and energy sources. Under this method, the year 2000 demand varies about 32,000 GWh to 44,000 GWh. (Ibid. pp. 20-22.)

30. Normally, short-term forecasts are made for 18 months. The 1980 short-term forecast was extended to 1986 using long-term judgment forecast information. In addition, information was obtained from local home

builders, commercial operations, and industrial customers regarding their expectations relative to new construction, additions and/or layoffs of workers, production increases and conservation accomplishments. Past experience has shown that these statements of expectations tend to be overly optimistic and have to be adjusted downward before they can be used to forecast effects on electrical loads. Furthermore, because of the cyclical nature of the economy, a depression was hypothesized to occur during the forecast period. Other economic assumptions were included. A 1981 short-term forecast has subsequently been made for 1982 and 1983. The latest figures for a 1982 forecast were $23,771 \times 10^6$ kWh and for 1983, $24,400 \times 10^6$ kWh. (Ibid. pp. 24-26. Also see Table 3A, p. 26A.)

31. Plant capacity required is based on peak load, i.e., maximum hourly demand for electricity. Peak load demand is developed by research on use by each rate class, i.e., customers paying the same rate schedule to define historical load characteristics. Assumptions are factored into forecasts relative to the level of economy, fuel price levels, conservation and new technologies. PP&L has peak loads in the summer and winter with the annual peak load occurring in January. A winter peak forecast of 6,860 MW for 1995, a sales growth to 1995 of 2.5 percent per annum and a 2.4 percent peak load growth are forecast. For planning purposes, a range of growth rates of 1 percent and 3.5 percent were investigated. (Ibid. pp. 27-29 and see Graph 5, p. 32.)

32. The Applicants' witness, McNair, explained the recent changes in the company's forecasts. The new forecast was approved September 28, 1981 and was lower than previous ones. The new compound growth forecast is 2.2 percent compared with the prior one of 2.5 percent and the new compound growth rate for peak load is 2.0 percent, rather than 2.2 percent. These changes are attributed to a slower growth in the economy, a lower number of new dwelling units, and lower annual use of electricity in electrically heated dwellings. (See McNair supplemental affidavit, ff. Tr. 1950 at pp. 1-2).

33. Electricity generated by Susquehanna will have the lowest operating costs of any facility on the PP&L system other than hydroelectric ones. Susquehanna will displace other plants that use more costly fuels such as oil and coal and the generation capacity freed thereby will, in turn, be used to displace other even more costly generation on the PJM interconnection. Thus, that part of the contention is inaccurate that states "the entire output of both units will be available for sale outside the service area." When Susquehanna is placed in service, PP&L will credit energy generated by these units to its customers. (Hecht, ff. Tr. 2049 at pp. 3, 5.)

34. The Applicants concede that capacity with Susquehanna added may be greater than required, but reserve margin is only one factor in

analyzing the "appropriateness" of new capacity. Other factors are diversity of fuel sources, conservation of oil and overall economics. Operation of Susquehanna will result in significant operating cost savings, fuel diversity, conserve substantial quantities of oil, and also provide a supplemental margin of service reliability for unexpected contingencies. (Ibid. p. 4.)

35. By PJM agreement, PP&L must maintain a reserve margin of about 10 percent over its winter peak. PJM has an overall peak in the summer but this is tending to change to a winter peak which is forecast for the late 1990's. As this occurs, the reserve margin requirement is projected to increase to 20 percent. Because the lead time for new construction is 10-12 years, PP&L would not be able to meet its reserve margin obligation in the mid-1980's unless other facilities were added that have relatively high operating costs, such as oil and gas-fired combustion turbines. The addition of Susquehanna will substantially benefit the reserve margin. (Ibid. pp. 7-8.)

36. Coal is considered vulnerable to a coal miner's strike and oil supplies are vulnerable to embargoes and other supply problems. The present mix of capacity by fuel sources is about 63 percent coal, 33 percent oil, and 4 percent hydro and the addition of Susquehanna will result in 49 percent coal, 26 percent oil, and 22 percent nuclear. (Ibid. pp. 8-9.)

37. Some costs will go up when Susquehanna goes on line because the utility is permitted to recover the total costs of providing service. These costs include capital-related costs (depreciation, return on investment, and taxes) and operating and maintenance costs (i.e., wages, material, contract engineering and labor, etc.), to operate and maintain its units. These increased costs are partially offset by lower fuel costs and increased sales to other members of PJM. The fuel costs for electricity used by PP&L's customers will be less with Susquehanna. Operation and maintenance costs include a calculated cost for decommissioning of \$191 million for a total annualized cost of \$18.5 million. For purpose of calculations, a pessimistic lifetime capacity factor of 50 percent, as well as an optimistic factor of 80 percent are used. (Ibid. pp. 9-10, 14 and p. 24.)

38. The calculations show that without Susquehanna, PP&L's revenue requirements for fuel and interchange costs would increase. The January 1982 present worth of those costs would be \$3.6 billion for low growth (1 percent) and \$4.7 billion for high growth (3-1/2 percent). (Ibid. p. 21.)

39. If Susquehanna were abandoned, PP&L's revenue requirements between 1983 and 1992 would be \$6.6 billion (low growth) to \$9.2 billion (high growth) higher than if the plant were to be placed in service as scheduled. The January 1982 present worths of those increases are \$2.6

billion to \$3.6 billion. A year's delay would increase revenue requirements for 1982-92 by \$400 million to \$800 million. (Ibid. pp. 21-24.)

40. The effect of an assumed growth rate of zero in energy sales and peak load even if combined with a 50 percent capacity factor shows a benefit of \$3.15 billion in the first 10 years with a present net worth of \$1.32 billion. (Hecht, supplemental affidavit, ff. Tr. 2051 at p. 2.)

41. The NRC Staff determination of benefit is not limited to conclusions regarding reliability or growth in electrical energy requirements. The benefit from operation of Susquehanna is the assurance of a low cost supply of electrical energy through minimization of production costs achieved through a substitution of electricity generated by this facility for electricity generated by more expensive units. Any reduction in total demand would not alter this condition. (Prasad, ff. Tr. 2196 at pp. 2-3.)

42. Only 2 percent and 23 percent of the capacity available to PP&L and PJM in 1982 can generate electricity at a cost equal to or lower than will be provided at Susquehanna, and this capacity is hydro or other nuclear. The remaining 98 percent of PP&L's capacity is coal (64 percent) or oil (34 percent). The remaining 77 percent of PJM's capacity is coal (34 percent), oil (26 percent), or combustion turbines (17 percent) (oil or gas). If Susquehanna is not operated, replacement energy would come from these more expensive fossil fuels. (Ibid. pp. 4-5.)

43. Even assuming that demand would decline so low that generation from 43 percent of PJM's capacity is not required, and that Susquehanna will operate at 60 percent capacity, and also considering fuel costs inflation, the fuel cost savings in the first year of operation of Unit 1 is \$30 million, and in 1983 with both units in operation, \$64 million. (Ibid. p. 6.)

44. An analysis by the U.S. Department of Energy estimated fuel replacement costs for Susquehanna in 1982 at \$162 million per year, based on equal replacement by coal and oil. The Applicants' witness analyses were based on an unusually low demand where coal would be the only replacement fuel. In either case, however, substantial savings from operation of Susquehanna exist. (Ibid. p. 7.)

45. The Board finds that the operation of Susquehanna will result in fuel diversity, conservation of oil and lower fuel costs of operation. The Board finds it will be more costly at this stage to abandon the plant than to operate it.

46. The Board finds that the plant is not needed at present to meet current reserve margin requirements, but it will help meet reserve requirements of the PJM power pool sometime between the mid-1980's and early 1990's.

47. The Board finds that operation of Susquehanna will permit its output to be substituted for more expensive operations in meeting its customer's needs.

3. Evacuation Emergency Plan¹¹ (Contention 6)

48. ECNP, in part and SEA, in part sponsored this contention, which, as admitted for hearing purposes, read as follows:

6. The emergency plan proposed by the Applicants is not sufficient to assure prompt notification and evacuation of all areas in which persons may be exposed to radiation doses in excess of those permitted by existing radiation exposure standards for the general public and Protective Action Guides. Specifically: a. The plan fails to account adequately for narrow roads and adverse weather conditions in the vicinity of the site. b. There is considerable question of the ability of Pennsylvania's Office of Radiological Health to fulfill its assigned functions in the event of an emergency. The Director of that office stated at a public meeting that his staff would not be able to respond at all hours to an accident at a nuclear facility. He has also, by affidavit, denied having made such a statement. This question must be resolved. Furthermore, the office has been unsuccessful in obtaining the amount of funding required to provide adequate qualified staff and equipment to be able to expand its capability to monitor and respond to a radiation emergency situation at Susquehanna. c. The plan includes insufficient information with respect to either the training of or the adequacy of radiation hazard safeguards to protect local emergency units which may be required to participate in emergency evacuation procedures or which may be required to deal with on-site situations. The plan does not state whether the public or the utility will provide the training in protection and procedure required by local emergency units to coordinate a safe, systematic evacuation.

49. Applicants for facility operating licenses are required by NRC regulations to submit emergency plans and the standards and requirements

¹¹ The Applicants' witnesses were Scott T. McCandless, Project Mgr., HMM Associates, who testified on a time evacuation study; Oran K. Henderson, V.P., Emergency Management Services, Inc. on the capabilities of the Bureau of Radiation Protection and off-site training; Robert M. Carroll, consultant, Emergency Management Services, Inc. on school evacuation and Steven H. Cantone, Mgr., Nuclear Support, Pennsylvania Power and Light Co. on on-site training; the Staff's witnesses were Stephen H. Chesnut, NRC Emergency Preparedness Branch, who testified on on-site emergency planning and Bruce J. Swiren, Federal Emergency Management Agency on off-site emergency planning; the Commonwealth's witnesses were Margaret A. Reilly, Bureau of Radiation Protection who testified on the capabilities of BRP and a panel composed of Adolph Belsler, Kenneth Lamison, Ralph Hippert, and John Comey, officials with Pennsylvania Emergency Management Agency who gave testimony on State and County emergency planning. No direct testimony was introduced from any intervenor.

for such plans are addressed in 10 CFR 50.47 and 10 CFR Part 50, Appendix E.¹² The regulations refer to NUREG-0654 FEMA-REP-1 Rev. 1, a document prepared to provide guidance and acceptance criteria for the development of emergency plans.¹³

50. NRC regulations and NUREG-0654 establish standards and criteria for the development of procedures to be followed by the Applicants in notifying State and local response organizations of radiological emergencies. The emergency plans must also provide for early and prompt communications with the public.¹⁴

51. For any radiological emergencies, responsibilities have been assigned and procedures established by the Applicant for the prompt notification of State and local response organizations. (SER Supp. 1, App. D, pp. 5-6 and SER Supp. 2, App. D, p. 3. See also Commonwealth Ex. 8, App. 3.)

52. Emergency response plans of the State and local county government provide for notification, communication of emergency warnings and instructions to members of the public. (Belser *et al.* ff. Tr. 2586 at pp. 1-3, Commonwealth Ex. 1, pp. 17-18; Commonwealth Ex. 8, Commonwealth Ex. 9.)

53. Specific messages for the public that relate to various levels of emergency have been included in local government response plans and the Applicants have developed a system for prompt alerting of the public to receive such messages through radio and television. For those with hearing difficulties or a lack of reception capabilities, the notification system will be supplemented by local police and fire forces in selected areas. (Commonwealth Ex. 9, Annex D, App. 1-5, pp. D1-D5. SER Supp. 1, App. D, p. D-6. Also see Commonwealth Ex. 9, Annex C., p. C-1. Belser *et al.* ff. Tr. 2586 at p. 2.)

54. In addition to requiring notification and instruction to the public within the plume exposure pathway, an area of about ten (10) miles in radius, emergency planning zone plans must include "A range of protective actions . . . for the plume exposure pathway EPZ for emergency workers

¹² See 10 CFR 50.34(b)(6)(v).

¹³ 10 CFR 50.47(b) n.1.

¹⁴ "Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations; the content of initial and follow-up messages to response organizations and the public has been established; and means to provide early communication and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established." 10 CFR 50.47(b)(5).

"Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public." 10 CFR 50.47(b)(6). Also see NUREG-0654 I.I.E. pp. 43-48.

and the public.¹⁵ And they also require the license applicant to provide an analysis of the time required to evacuate and for taking other protective actions for various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations. However, maximum time allowances for evacuation are not required.¹⁶

55. The Applicant has provided an evacuation time estimate study for the plume exposure pathway EPZ prepared by HMM Associates. (McCandless Testimony, ff. Tr. 2250.)

56. The evacuation time estimate study calculated the time required to evacuate from the plume exposure pathway EPZ, all permanent residents, transient population and special facilities containing school students, hospital patients and nursing home residents, as well as inhabitants of non-automobile-owning households. (Ibid. p. 6.)

57. HMM Associates used a computer evacuation simulation model to develop time estimates that has been validated by field data and a Federal Highway Administration model. The model has been used previously to estimate evacuation times for eight (8) nuclear power plant sites. (Ibid. p. 4.)

58. The highway network in the time estimate study for evacuation was taken from State and County emergency plans and validated for use by field inspections. (McCandless, Tr. pp. 2277-78; Belser *et al.*, ff. Tr. 2586 at pp. 3-4, 27.) Major evacuation routes were selected by PEMA in conjunction with the Commonwealth's Department of Transportation. (Belser, Tr. pp. 2638-39.)

59. Field inspections of intersections and links in the highway network and traffic controls were undertaken for information in the time estimate study. (McCandless Tr. pp. 2252-53 and 2278-80.) Only outbound links of the highway network were used, so that evacuation traffic could bypass accident obstacles without excessive delay. (Ibid. p. 2264.)

60. The evacuation time analysis considered several different time periods, different populations, and adverse weather conditions (snow or rainfall, flooding of Susquehanna River, icing and winter storm) in meeting the recommendations of NUREG-0654. (McCandless ff. Tr. 2250 at pp. 8-11; also see NUREG-0654, App. 4.)

61. The assumptions used for evacuation mobilization and preparation times of different population groups were based on discussions with County officials. (McCandless ff. Tr. 2250 at p. 7.)

62. The Applicants' time evacuation study calculated the entire plume exposure pathway EPZ could be evacuated with six hours or less during

¹⁵ 10 CFR 50.47(b)(10).

¹⁶ 10 CFR Part 50, App. E, IV. See also NUREG-0654, p. 61 and App. 4.

weekdays, five hours or less during weekends or night periods and in less than nine hours under the adverse weather conditions reviewed. The time estimates are comparable to those at other nuclear power plants studied by HMM. (Ibid. pp. 8-12.)

63. The Commonwealth of Pennsylvania and HMM agree that if buses are required to make two trips to accommodate evacuation of the non-auto-owning population, another hour and 40 minutes should be added to the weekday time period. (McCandless Tr. p. 2260; Belser *et al.*, ff. Tr. 2586 at p. 27.)

64. In the event of a nuclear emergency, it is planned that all students in school will be evacuated and will not be sent home. (Carroll, Tr. p. 2333.)

65. Both the Commonwealth of Pennsylvania and local plans contemplate the use of school buses for evacuation of students where required. (Commonwealth Ex. 8, p. 15 and Ex. 9, Annex N, p. N-1.)

66. The evacuation of students by buses is assumed to start ninety minutes after an evacuation signal is communicated. (McCandless, ff. Tr. 2250 at p. 7.)

67. Although there is no specific requirement to have written school evacuation plans in meeting the recommendations of NUREG-0654, there is general agreement among the parties that written school emergency plans should be prepared prior to the facility's operation. (Carroll, Tr. p. 2317; Belser, Tr. pp. 2607-2608; Swiren, Tr. pp. 2675-76.) It should also be noted that the Luzerne County Plan refers to "the development of protective action plans" being a responsibility of school officials. (See Commonwealth Ex. 9, App. N.)

68. There are no written evacuation plans by schools within the plume exposure pathway EPZ at the present time. (Carroll, Tr. p. 2317; Henderson ff. Tr. 2546 at p. 28.)

69. NUREG-0654 recommends written agreements among Federal, State, and local agencies and other support organizations having emergency response roles within the Emergency Planning Zone. (Staff Ex. 7, p. 32.)

70. The functions of the Office of Radiological Health named in the contention have been transferred to the Bureau of Radiation Protection, a part of the Commonwealth's Department of Environmental Resources. (Tr. 2348.)

71. The Bureau of Radiation Protection (BRP) has the responsibility of assessing an emergency at a nuclear facility and advising the lead State Agency the Pennsylvania Emergency Management Agency (PEMA) on protective actions that should be taken. It also serves as a primary source for providing technical guidance to limit radiological exposures of emer-

gency workers, and for providing assistance to State agencies and local governments on radiation exposure, detection, decontamination, and protective actions. (Commonwealth Ex. 8, p. 15; Reilly ff. Tr. 2434 at pp. 2-3.)

72. Since the Three Mile Island incident in March 1979, the funding level for BRP has increased from \$600,000 to \$990,000. (Henderson, ff. Tr. 2340 at p. 2; Reilly, Tr. p. 2485.)

73. Personnel and equipment available to BRP in the event of a nuclear emergency is adequate for the implementation of its responsibilities. (Reilly Testimony, Tr. p. 2496; ff. Tr. 2434 at p. 3; Swiren ff. Tr. 2519 at pp. 3-4.)

74. The BRP is capable of responding to an emergency on a twenty-four hour basis. (Reilly, ff. Tr. 2434 at p. 3.)

75. In recommending immediate protective actions, the BRP would rely on the Applicants' off-site and on-site data. (Reilly, ff. Tr. 2434 at p. 2; Testimony, Tr. p. 2452.)

76. During an emergency, the BRP will establish direct communications with the Applicants' facility and PEMA on dedicated phone lines. (Reilly Testimony, Tr. p. 2455, Henderson, ff. Tr. 2340 at p. 2.)

77. The BRP has the capability of establishing six monitoring teams at the Susquehanna facility within three hours of notification. (Reilly, ff. Tr. 2434 at p. 2; Tr. 2454. Also see Swiren, ff. Tr. 2519 at p. 3.)

78. Off-site monitoring stations, which are used to confirm radiological data, include seventeen BRP locations, thirty-five NRC and sixty locations by the Applicants. These are not used to decide immediate protective actions. (Commonwealth Ex. 2; Reilly Testimony, Tr. pp. 2450-2451.)

79. Radiological response training is required by NRC regulations and criteria for those who may be called to assist in emergencies.¹⁷

80. The responsibility for on-site training is exercised by the Applicants and for off-site by the State. (Belser *et al.*, ff. Tr. 2586 at p. 4; Cantone, ff. Tr. 2383 at p. 2.)

81. The Applicants provide training for police, fire, and ambulance personnel who may come on site during an emergency. Further training is available for hospital personnel and State and local officials who have an emergency management role. Training covers emergency planning overview, calculations and projection, protective actions, basic radiation theory, plant layout, contaminated injury and access control. (Ibid. pp. 2-5.)

82. Parts of the training program have been initiated and it is intended to have it completed before the end of 1981 and certainly prior to operation of the facility. Annual retraining is contemplated. (Cantone Testimony, Tr. pp. 2395-96.)

¹⁷ 10 CFR 50.47(b)(15); NUREG-0654, pp. 75-77.

83. Members of off-site responding agencies will receive dosimeters to record radiation exposure and protection equipment, including clothing, where required. Supplies of potassium iodide will be available to mitigate the consequences of radioactive iodine. (Cantone, ff. Tr. 2386 at p. 6.)

84. Fire, contaminated injury and full-scale emergency plan drills will test the training program periodically. (Ibid. p. 5.)

85. The Applicants' quality assurance organization will audit the emergency plan to assure that the response training program is implemented. (Cantone Testimony, Tr. p. 2417.)

86. The State's Disaster Operations Plan establishes responsibilities for development and implementation of training programs. (Commonwealth Ex. 8, Annex E, App. 10 and Section VII.)

87. Appendix 10 of the State's plan indicates the availability of training programs sponsored by Federal and State agencies. (Ibid. Annex E.)

88. The draft emergency plan of Luzerne County, one of the two counties in the plume exposure pathway EPZ, enumerates the number of persons that will participate in the State's training program. (Henderson, ff. Tr. 2358, at p. 3.)

89. Some funding for training programs is provided to the State by the Federal Emergency Management Agency (FEMA) and the State attempts to schedule its training courses in areas close to the region of the attendees. (Henderson Testimony, Tr. pp. 2364, 2366.)

90. The criteria of NUREG-0654 recommends that for radiation exposure control both self-reading and permanent record type dosimeters should be distributed to emergency workers. (Staff Ex. 7., K.3.A, p. 67.)

91. Although there is no requirement in NRC regulations, both State and local government plans call for three dosimeters to be distributed to emergency workers. (Belser *et al.*, ff. Tr. 2586 at p. 19; Swiren Testimony, Tr. pp. 2698-99.)

92. The State has identified a shortage of dosimeters statewide. (Belser Testimony, Tr. p. 2607; Swiren Testimony, Tr. p. 2679.)

93. In order to obtain the necessary number of dosimeters, the State will either have to purchase them or the Applicants will, or they will have to be obtained on a loan basis. Another alternative is to allocate the existing limited State supply to provide an approximate amount of coverage. (Swiren Testimony, Tr., pp. 2672-73.)

94. An adequate supply of dosimeters should be distributed prior to the existence of an emergency. (Ibid. pp. 2676-77.)

4. Unresolved Generic Safety Issue (Contention 7)

95. The contention was sponsored by the Environmental Coalition on Nuclear Power (ECNP) and states that:

7. The Nuclear Steam Supply Systems of Susquehanna 1 and 2 contain numerous generic design deficiencies, some of which may never be resolvable, and which, when reviewed together, render a picture of an unsafe nuclear installation, which may never be safe enough to operate. Specifically, (b) the cracking of stainless steel piping in BWR coolant water environments due to stress corrosion has yet to be prevented or avoided.

96. Only the Applicants and the NRC Staff presented direct cases on the contention.¹⁸

97. Intergranular stress corrosion cracking (IGSCC) generally occurs in areas immediately adjacent to welds attaching the piping to elbows or fittings. The location of the cracks indicates that the phenomenon is produced by the welding process. (Lemaire, ff. Tr. 1916, at para. 13.)

98. The incidence of IGSCC at BWRs has been low as only 267 out of approximately 34,000 weld heat-affected zones have experienced it in 400 reactor-years of experience. (Ibid., para. 11.) As a result of analytical, field and laboratory efforts by industry and the NRC Staff, the causes of, and solutions to, the IGSCC problem are well understood. (Ibid. paras. 7, 8; Litton, ff. Tr. 1927, at p. 2.)

99. In order for IGSCC to occur in a pure, high temperature water environment such as is used in Susquehanna, three concurrent conditions must be present: a susceptible material, a tensile stress in excess of the local yield stress, and the presence of a corrosive atmosphere or medium such as dissolved oxygen in the coolant. (Lemaire, ff. Tr. 1916, at paras. 14-21, 26-28; Litton, ff. Tr. 1927 at pp. 2-3; Litton Testimony, Tr. p. 1930.)

100. Based on an understanding of the causes of IGSCC, General Electric developed a program to identify and qualify remedies for the cracking. (Lemaire, ff. Tr. 1916, at para. 29.) Several methods qualified by General Electric's program for preventing or mitigating IGSCC, have been used at various locations at Susquehanna. (Ibid. paras. 32-42.)

101. In NUREG-0313, Rev. 1 (NRC Staff Ex. 6), the NRC Staff set forth the methods which it considers acceptable for reducing the suscepti-

¹⁸ The Applicants' witnesses were: Joseph C. Lemaire, a materials expert with the General Electric Co., and Walter J. Rhoades, a Supervisor of the Mechanical-Nuclear Group with Pennsylvania Power and Light Company. Their testimony analyzed the problem and procedures for remedying it at Susquehanna. The Staff Witness, Felix B. Litton, a Senior Materials Engineer with the NRC testified on Staff guidance to resolve the problem and actions taken thereto by the Applicants. No direct testimony was put on by any intervenor.

bility of BWRs to IGSCC. (Litton, ff. Tr. 1927, p. 3.) Applicants have followed the guidance of NUREG-0313 and undertaken an extensive program to reduce the potential for IGSCC. (Ibid, p. 3; Rhoades, ff. Tr. 1939, at para. 4; Bd. Ex. 3, p. 1.)

102. One method of avoiding IGSCC is solution heat treatment of piping after fabrication. This procedure eliminates sensitization and residual stress and makes the material immune to IGSCC. (Lemaire, ff. Tr. 1916, at para. 33.) At Susquehanna, the recirculation system riser piping shop welds have received solution heat treatment. (Rhoades, ff. Tr. 1939, at para. 7; Bd. Ex. 3, p. 2.)

103. Corrosion resistant cladding consisting of austenitic stainless steel weld metal containing more than 8% ferrite in the final fabricated condition is effective in preventing IGSCC. (Lemaire, ff. Tr. 1916, at para. 34.) At Susquehanna, low carbon, corrosion resistant cladding has been applied to field-welded portions of the recirculation system riser piping. (Rhoades, ff. Tr. 1939, at para. 8; Bd. Ex. 3, p. 2.)

104. Weld metal with a ferrite level of 5% or more is not susceptible to IGSCC initiation. (Lemaire, ff. Tr. 1916, at para. 39.) At Susquehanna, all weld metal and all Type 304 and Type 316 castings in the reactor pressure boundary have at least 5% ferrite content. (Rhoades, ff. Tr. 1939, at para. 9; Bd. Ex. 3, p. 3.)

105. A technique known as induction heating stress improvement ("IHSI") can be used to reduce greatly the residual tensile stress produced in the region adjacent to the weld by the welding process and increase resistance to IGSCC. (Lemaire, ff. Tr. 1916, at para. 38.) At Susquehanna, welds in the piping constituting the reactor coolant boundary not replaced by IGSCC resistant material will receive IHSI and/or augmented in-service inspection. (Rhoades, ff. Tr. 1939 at para. 11; Bd. Ex. 3, p. 4; Litton, ff. Tr. 1927 at p. 4.)

106. Use of low carbon stainless steel materials, such as limited carbon Type 304 stainless steel with less than or equal to 0.030% maximum carbon and Type 304L stainless steel (0.035% maximum carbon), will reduce the possibility of IGSCC. (Lemaire, ff. Tr. 1916, at paras. 40-42.) There is successful operating experience with these low carbon stainless steel materials. Low carbon stainless steel has been used in selected applications, and there are hundreds of welds in place made out of low carbon stainless steel without ever experiencing a cracking incident. (Lemaire Testimony, Tr. pp. 1923-24.) At Susquehanna, materials susceptible to IGSCC have been replaced, where practicable, with materials that are substantially less subject to IGSCC. Among others, the recirculation system discharge valve bypass lines, all piping in the head spray system, almost all piping in the instrument piping and bottom drain line, have been

replaced with Type 304L stainless steel or with limited carbon Type 304 stainless steel having a maximum carbon content of 0.03%. (Rhoades, ff. Tr. 1939, at para. 10; Litton, ff. Tr. 1927, at pp. 3-4; Bd. Ex. 3, p. 1.) Also, the control rod drive hydraulic return line, which was Type 304 stainless steel, was removed and the design modified. (Rhoades, ff. Tr. 1939, at para. 12; Bd. Ex. 3, p. 2.)

107. Another way to protect against IGSCC is to reduce the stress to which the piping is subjected. All pipe components at Susquehanna are designed in accordance with ASME Code requirements that stresses be kept below specified values. (Lemaire, ff. Tr. 1916, at para. 43.)

108. The margin against IGSCC can be increased by reducing the oxygen content of the coolant water during startup and shutdown conditions. (Ibid. para. 26.) At Susquehanna, the control rod drive pump intake has been relocated to allow use of CRD water with the lowest oxygen concentration available. (Bd. Ex. 3, p. 2.) During all other phases of operation/shutdown, oxygen levels are reduced at Susquehanna by use of a mechanical vacuum deaerator which is expected to maintain the oxygen content in reactor coolant water below 0.25 ppm. (Rhoades, ff. Tr. 1939, at para. 5; Bd. Ex. 3, p. 2.)

109. Finally, the material subject to IGSCC, austenitic stainless steel, is highly ductile and thus not susceptible to sudden fracture. Therefore, any cracks that develop as a result of IGSCC will most likely be detected prior to leaking or while the leakage rate is small. (Lemaire, ff. Tr. 1916, at para. 9.) This principle has been verified in the laboratory through detailed analysis and metallographic examination of crack samples. (Ibid. para. 10.) It has also been demonstrated in operating experience, for no pipe has ever suffered a severance at a BWR due to IGSCC. (Ibid. para. 9.)

110. A continuous on-line leak detection system has been implemented at Susquehanna. The system, which conforms with the requirements of NUREG-0313, consists of temperature, pressure and flow sensors with associated instrumentation and alarms. The system detects and annunciates leakages in the following systems: main steam lines, reactor water cleanup system, residual heat removal system, reactor core isolation cooling system, feedwater system, and high pressure coolant injection system. (Susquehanna Steam Electric Station Final Safety Analysis Report ("FSAR"), p. 5.2-40, ff. Tr. 1943; Rhoades, ff. Tr. 1939 at para. 13; Bd. Ex. 3, p. 4.)

111. The leak detection system at Susquehanna is capable of monitoring flow rates with an accuracy of 1 gallon per minute ("gpm"). Small leaks (5 gpm and less) in the reactor coolant piping are detected by temperature and pressure changes and drain pump activities. (FSAR

§5.2.5.1, pp. 5.2-40 to 5.2-42, ff. Tr. p. 1944.) Once unidentified leakage in an area increases by more than 1 gpm during a given hour, or if there is unidentified leakage of 5 gpm in a 24-hour period, the plant must be shut down to perform inspections and identify the leakage. (Rhoades Testimony, Tr. pp. 1940-41.)

112. In-service inspections are to be performed on reactor coolant pressure boundary welds at Susquehanna in accordance with the ASME Code and NUREG-0313. In some areas, the inspection frequency has been increased from what the Code requires in order to compensate for the inability to replace the sensitized stainless steel. (Ibid. at pp. 1941-42; Litton, ff. Tr. 1927 at p. 4.) This augmented in-service inspection program will provide a high likelihood of detecting cracks before leakage occurs. (Litton, ff. Tr. 1927 at p. 4; Litton Testimony, Tr. 1931.) The leak detection system at Susquehanna will further assure that any IGSCC that might occur will be detected and corrected before pipe rupture can take place. (Lemaire, ff. Tr. 1916, at para. 45.)

5. Decommissioning* (Contention 9)

113. This contention as approved and litigated states:

9. The Applicants have underestimated both the health costs and the monetary costs of decommissioning the Susquehanna facility. The monetary costs estimates are derived from an industry-sponsored study which is obviously biased, with cost estimates far below what the actual cost of decommissioning will be. Such cost will at least be equal to the cost of construction. Further, the statement by the Applicants that it is "generally agreed" that the decommissioning of a large nuclear power facility poses no new occupational or environmental hazards is erroneous. There are serious radiation hazards, particularly for workers. As a result:

- (a) These costs, when added to other monetary and health costs of the facility and the nuclear fuel cycle, tilt the cost-benefit balance against authorizing operation of the facility;
- (b) The Applicants are not financially qualified to assume the monetary costs of decommissioning.

114. Only the Applicants and the NRC Staff presented direct cases on this contention.¹⁹

* Effective March 30, 1982, the Commission has eliminated issues concerning financial qualifications including decommissioning costs from operating license proceedings. Accordingly, no further consideration can be provided to Contention 9(b) herein.

¹⁹ The Applicants' witnesses were: A.A. Weinstein, Mgr. of Engineering of S. M. Stoller Corp. who testified on methods and costs of decommissioning; and G. F. Vanderslice, V.P.

(CONTINUED)

115. At the end of the Susquehanna units' operating life, termination of their operating licenses will be requested by Applicants. Applicants will be required at such time to submit a plan to the Commission for decommissioning the units, i.e., decontaminating the facilities so that the level of any residual radioactivity remaining at the site is low enough to allow unrestricted use of the site. (FES, p. 8-26; Weinstein, ff. Tr. 1259, at p. 1; Weinstein Testimony, Tr. pp. 1265-66; Feldman Testimony, Tr. pp. 1347-48.)

116. Reactors decommissioned to date have used one of three decommissioning modes: (1) immediate dismantlement; (2) safe storage followed by deferred dismantlement; and (3) entombment. Immediate dismantlement is the most expensive mode of decommissioning large nuclear facilities. (Weinstein, ff. Tr. 1259, at p. 1; Feldman Testimony, Tr. 1347-48; FES, pp. 8-26 to 8-28.)

117. Considerable experience exists in decommissioning nuclear reactors. It is expected that even more experience will have accumulated in the next 30 to 40 years before the Susquehanna units are due for decommissioning. Decommissioning is a straightforward engineering operation which can be accomplished with a minimum of difficulty, and whose costs can be estimated with a fair degree of accuracy. (Weinstein, ff. Tr. 1259 at pp. 1-2 and Testimony, Tr. 1327-28.)

118. Under contract to the Commission, the Pacific Northwest Laboratory ("PNL") of Battelle Memorial Institute recently completed a comprehensive study of the methods and costs of decommissioning a reference BWR. PNL developed detailed work plans based on the reference plant design and expected levels of activation and contamination based on typical BWR experience. (Weinstein; ff. Tr. 1259, at p. 2; Feldman Testimony, Tr. p. 1363.) PNL developed cost estimates for each cost element as well as an overall estimate of the cost of decommissioning the facility for each of the three modes of decommissioning. (Weinstein, ff. Tr. 1259, at p. 2. Also see Tables 3, 5, 6, and 7, pp. 7, 31, 32, 35.)

119. The PNL study was based on the decommissioning of a plant similar in design and power output to the Susquehanna units. PNL's estimates of the costs of decommissioning represent a reasonable approximation of the anticipated cost of decommissioning the Susquehanna facility. (Weinstein, ff. Tr. 1259 at p. 5 and Testimony, Tr. pp. 1263, 1272, 1294, and 1320.)

and Comptroller of Pennsylvania Power and Light Co., who testified on the Applicants' financial plan for decommissioning. The staff's witnesses were: Dr. Carl Feldman who testified on radiation hazards; Dr. Raghaw Prasad on costs of decommissioning compared to construction costs; and M. L. Karlowicz on the financial qualifications of the Applicants to handle decommissioning costs.

120. Applicants estimated the costs for immediate dismantlement of Susquehanna based on the PNL Study, adjusted to reflect design differences. This estimate came to \$89 million (1980 dollars) for one unit and \$176 million for both units done concurrently. The estimate was then adjusted by adding a 100% contingency to disposal charges, to account for the regulatory uncertainties in this area. With this added contingency, the cost of decommissioning both Susquehanna units by immediate dismantlement was given as \$191 million (1980 dollars). (Weinstein, ff. Tr. 1259, at pp. 5 and 28.)

121. The NRC Staff also estimated, on the basis of the PNL Study, the cost of immediate dismantlement of the Susquehanna units. The NRC Staff computed a total of \$157 million (1980 dollars) for both units. (FES, pp. 8-26; Prasad, ff. Tr. 1525, p. 3.) The NRC Staff has adopted Applicants' estimate of \$191 million as the more conservative. (Karlovicz, ff. Tr. 1401, at pp. 2-3; SER, p. 20-4.)

122. Another estimate of the costs of decommissioning the Susquehanna units was prepared by extrapolating costs experienced in previous decommissionings, particularly the Elk River reactor. Applicants developed various scaling factors for the Elk River costs to take into account the differences between Elk River and Susquehanna. Applying the Elk River decommissioning costs and appropriate scaling methodology to the Susquehanna configuration, Applicants obtained estimated costs (in 1980 dollars) of \$108 million for the decommissioning of a single Susquehanna unit, and \$215 million for both units done concurrently. (Weinstein, ff. Tr. 1259, at pp. 2, 5 and 23, Table 4.)

123. The Elk River-based estimate was then adjusted to account for potential overestimation of the scaling factors. With those adjustments, the cost in 1980 dollars of decommissioning both Susquehanna units by immediate dismantlement on the basis of Elk River costs would be \$184 million, which is within 4% of the \$191 million PNL-based estimate. (Weinstein, ff. Tr. 1259, at pp. 28-29.)

124. Cost estimates for the other two methods of decommissioning were also developed by Applicants based on PNL's study. The total cost of accomplishing a deferred dismantlement of both Susquehanna units, taking into account the time value of the deferred expenditures, would be \$109 million (1980 dollars). (Ibid. pp. 29-33.) Similarly, the estimated cost of entombment of the Susquehanna units (assuming the reactor internals are left in place and surveillance continues for 100 years), considering the deferred expenditures for annual surveillance, would be \$131 million. (Ibid. pp. 33-36.)

125. Both occupational radiation exposures and exposures to the general public result from decommissioning. PNL's study of the decommissioning

of a large (1200 MWe) BWR estimated the occupational radiation doses that will be received by the workers engaged in decommissioning work, and by the general public, for the three decommissioning alternatives. (Feldman, Tr. ff. 1344, at pp. 2-3.) PNL's estimates of the total exposure for decommissioning activities were obtained by examining each decommissioning task, evaluating the radiation field associated with the task and the man-hours required to accomplish it, and determining the resulting doses. (Weinstein Testimony, Tr. p. 1262; Feldman Testimony, Tr. pp. 1351-55; Feldman, ff. Tr. 1344, at p. 4.)

126. Based on PNL's estimates, occupational worker exposures as analyzed by Staff and Applicants, respectively, for immediate dismantlement of both Susquehanna units would be 1,845 to 3,690 man-rem over a three to four year period. (Feldman, ff. Tr. 1344, at p. 3; Weinstein, ff. Tr. 1259, at pp. 36, 40-41.) For safe storage followed by deferred dismantlement, the dose for both units would be 385 to 770 man-rem over the two to three years of preparation for safe storage and 6 man-rem when dismantlement was accomplished. (Ibid. pp. 36, 40-41; Feldman, ff. Tr. 1344, at p. 3.) Finally, for the entombment case, 1,573 to 3,146 man-rem would be received by workers during the three to four years needed to entomb the units. (Weinstein, ff. Tr. 1259, at pp. 36, 40-41; Feldman, ff. Tr. 1344, at p. 3.)

127. The annual radiation doses that will be received by workers during the decommissioning of Susquehanna would be on the order of, or less than, those received under normal operation of the plant and within allowable Commission limits for worker exposure. This is true even if higher than anticipated levels of contamination exist in the facility at the time of decommissioning if proper decontamination procedures are utilized. (Weinstein Testimony, Tr. p. 1261; Feldman Testimony, Tr. 1359-60, Feldman, ff. Tr. 1344, at pp. 3-5.)

128. Sources of exposure to the general public during decommissioning arise from gaseous and liquid effluent releases, direct radiation from the plant, and direct radiation due to transportation of spent fuel and radioactive waste to reprocessing or burial facilities. For the maximum exposed individual, estimated 50-year radiation dose equivalents to the lung per unit are: 0.041 mrem for immediate dismantlement; 0.0031 mrem for safe storage; and less than 0.038 mrem for entombment. Population doses for a population of 3.5 million within a 50-mile radius of the site are 0.05 man-rem, 3×10^{-4} man-rem, and 0.04 man-rem, respectively, for immediate dismantlement, safe storage and entombment. (Weinstein, ff. Tr. 1259, at pp. 40-41.) Therefore, decommissioning large reactors, such as the Susquehanna units, should pose no serious radiation hazards to either radiation workers or the general public. (Feldman, ff. Tr. 1344, at pp. 2, 5; FES, p. 8-26.)

6. Storage Of Low-Level Radioactive Waste (Contention 11)

129. As the result of the Board's granting of a motion for summary disposition of that part of the original contention which related to on-site storage of spent fuel, only that section of the contention relating to on-site storage of low-level radioactive wastes was litigated in the evidentiary hearing. As modified, the contention states that:

11. The proposed project creates an unreasonable risk of harm to the health and safety of petitioners and their private property, and violates the Commission's standards for protection against radiation in 10 CFR §§20.1 and 20.105(a), in that the applicants have failed to provide adequately for safe on-site storage, for periods of up to 10 to 15 years, of low-level radioactive wastes.

130. Intervenor Marsh was the sole sponsor of this contention as it was admitted to the proceeding. She did not appear at the evidentiary hearing.²⁰

131. NRC regulations do not require a specific amount of space or capacity or the ability to store low-level radioactive waste (LLRW) for any specific period of time. NRC guidance to Applicants suggests that space to accommodate at least 30 days of waste at normal generation rates be provided and that the storage be indoors. Traditionally, the amount of space provided has been that which will enable a licensee to accumulate a full shipment for off-site disposal. (Staff Ex. 1 pp. 11-14, 11-15; Loysen, ff. Tr. 1655 at p. 2.) The Board considers therefore only whether Applicants' proposed LLRW storage mode presents an unreasonable risk of harm to the health and safety of the public.

132. Applicants intend to ship all low-level radioactive wastes generated at the Susquehanna facility to a commercial LLRW disposal site and have a contractual agreement with Hittman Nuclear and Development Corporation for transportation and disposal services. Because Applicants have no guarantee that off-site disposal capacity will be available when it is needed they have decided to construct an on-site interim LLRW Holding Facility. It is intended to be used only if off-site disposal becomes unavailable. (Keiser, ff. Tr. 1572 at pp. 1-2).

133. The storage capacity of the on-site LLRW Holding Facility will accommodate the LLRW generated during four years of operation of both

²⁰ The Applicants' witnesses were Messrs. Harold W. Keiser, PP&L's Superintendent of Plant for the Susquehanna facility and Richard J. Tosetti, Chief Nuclear Engineer for Nuclear Fuel Operations, Bechtel National, Inc. The Staff's witnesses were R. L. Bangart, Leader of the Systems Analysis Section in the Effluent Treatment Systems Branch, Office of Nuclear Reactor Regulation of the NRC and Peter Loysen, a Senior Chemical Engineer in the Advanced Fuel and Spent Fuel Licensing Branch, Division of Fuel Cycle and Material Safety of the NRC.

units. The building stands separate from the reactor facility and the LLRW is to be stored in solidified form. The Low-Level Radioactive Waste Policy Act as enacted by the U.S. Congress in 1980 and current actions of the Governor of Pennsylvania in response to that Act, leads to the conclusion that action is being taken to increase the off-site disposal capacity available. (Keiser testimony, Tr. pp. 1580, 1583, 1589-1590, 1594.)

134. The LLRWHF is a separate building located within the security fence approximately 1000 feet from the Turbine Building at a grade elevation which is 152 feet above the probable maximum flood that may be experienced at the Susquehanna site. It consists of a reinforced concrete storage vault within a steel-framed, metal-side structure. The LLRWHF meets the seismic requirements of the Uniform Building Code, and its vault is capable of withstanding tornado-force winds, although not necessarily tornado induced missiles. (Tosetti, ff. Tr. 1598 at pp. 1-2; Tosetti Testimony, Tr. p. 1612.)

135. LLRW stored in the LLRWHF will be solidified process wastes and contaminated trash. Process wastes are solidified by incorporating material into a cement matrix, and dewatered; they are contained within steel liners approximately $\frac{3}{8}$ inches thick. The anticipated corrosion rate of the liners (0.001 to 0.003 inches per year) is a small fraction of the liner thickness, hence the storage of waste will not affect the integrity of the liners. The liners will be designed to 10 CFR Part 71 requirements and will not support combustion. (Tosetti, ff. Tr. 1598 at p. 4.)

136. The other kind of LLRW generated at Susquehanna consists of dry solids (trash) contaminated with radioactive materials. The solids will be packaged in 55-gallon steel drums and large (100 cubic feet) steel boxes. This waste is very low in radioactivity. (Ibid. p. 5; Bangart, ff. Tr. 1648 at p. 3.)

137. Each form of waste will be stored separately at the LLRWHF, with solidified process wastes being stored within the concrete vault. All waste material stored in the LLRWHF will be packaged in a form suitable for off-site shipment and permanent disposal. (Tosetti, ff. Tr. 1598 at pp. 3-5.)

138. The LLRWHF has a design life of 40 years and can store waste safely for at least that period of time. (Tosetti Testimony, Tr. pp. 1599, 1611.) However, such prolonged storage of waste should not be necessary. New off-site disposal capacity should begin to be available in about five years. (Loysen, ff. Tr. 1655, at p. 3.)

139. If off-site disposal capability is not available while the LLRWHF is being filled up, Applicants will have several years in which to address the problem. During that period of time, there will be activity both at the

national level to establish additional sites and by Applicants to remedy the problem, including (if necessary) construction of another interim holding facility on-site. (Keiser Testimony, Tr. pp. 1592, 1594.)

140. The LLRWHF will be occupied only during loading and unloading periods. The facility is designed to minimize exposure to operating personnel; this is accomplished by providing appropriate shielding and suitable administrative controls, so as to keep worker radiation exposure within the limits of 10 CFR Part 20 and 40 CFR Part 190. (Tosetti, ff. Tr. 1598 at pp. 6-7.)

141. An estimate of the radiation exposure at the Susquehanna site boundary assuming maximum radiation levels in the waste, a facility completely filled with waste, and continuous presence by an individual at the site boundary, was only 1.1 mrem per year, well within 10 CFR Part 20 permissible exposure limits. (Ibid. p. 8.)

142. A study of potential accidents at the LLRWHF demonstrated that resulting radiation levels were a small fraction of 10 CFR Part 100 guidelines. (Ibid. p. 8; Tosetti Testimony, Tr. pp. 1606-1608.)

7. Health Effects of Electric Fields (Contention 17)

143. The Board in its order of March 6, 1979, admitted Contention 17, as follows:

17. The Applicants' plans for transmitting electricity generated by the Susquehanna facility utilize ultra-high voltage (UHV) transmission lines, which produce noise pollution, cause electrical shock from flashovers, create television and radio interference, create strong electrostatic and electromagnetic fields that adversely affect living organisms along the UHV transmission right-of-way and beyond, and generate dangerous levels of ozone that will cause more injury to vegetation than any other pollutant and can also have harmful effects on human health. For that reason, the Applicants should be barred from transmitting electricity from the facility, if and when it becomes operational, over UHV lines and should be required to use lines in the range of 138,000-230,000 volts maximum. Alternatively, the Applicants should be required to place the UHV lines underground, using compressed gas as an insulator.

144. Applicants filed a motion for summary disposition of the part of this contention that dealt with ozone emissions and a subsequent motion for summary disposition of the remaining portions. The Board granted those motions except for the health effects of electric (electrostatic) fields on living organisms in the vicinity of a 500 kV transmission line. Since

that item was left open, a decision on the transmission line modes was also postponed.

145. Applicants' witness²¹ based his assessment on a calculated maximum electric field of 11 kV/m at ground level at the point of minimum clearance on the right-of-way of the Susquehanna lines and 2.28 kV/m at the edge of the right-of-way. Living organisms respond to many stimuli, but their effects are not considered hazardous unless they impair the organism's ability to function properly or the recovery capability of the organism. There are no substantiated effects of exposure to electric fields of the magnitude and frequency in the Applicants' transmission lines which can be considered hazardous. (Michaelson, ff. Tr. 1046 at pp. 2-4.)

146. The electric fields produced by the Susquehanna lines cannot produce sufficient heating of tissues or molecular polarization or deformation to cause significant biological effects. (Ibid. pp. 4-5.) The currents produced within the body are on the order of 0.1 to 1 milli-amperes/square meter, well below the level of perception. (Ibid. p. 6.)

147. While some writers have postulated that behavioral and central nervous system modifications result from exposure to high voltage electric fields, these are not amenable to explanation using traditional theoretical analysis. If they exist, they are caused by some unknown biophysical mechanism. (Ibid. p. 7.)

148. A study by Johns Hopkins University scientists of 11 long-line maintenance workers for 42 months on a 345 kV system showed no change in physical, mental, or emotional characteristics. (Ibid. pp. 8-9.) An investigation by Strumza of exposed (25 m from 200-400 kV) and unexposed (more than 125 m) populations showed no significant difference in medical visits and druggists bills. (Ibid. p. 9.) No adverse health symptoms were observed in a study by Roberge of 56 switchyard workers (735 kV) for years. (Ibid. p. 9.) In an East German study, 110 linemen (110-380 kV) were compared to a control group of electrical maintenance men (at less than 5 kV/m) with no difference reported in state of health. (Ibid. pp. 9-10.)

149. Some Soviet studies indicate biological effects on switchyard workers exposed to high voltage electric fields, such as headaches, fatigue, digestive disruptions and cardiovascular changes. There are methodological faults in these studies and extraneous factors could be involved. The

²¹ Applicant's witness was S. M. Michaelson; a Professor of the University of Rochester Medical Center, who testified on the health impact of electric fields on humans and animals. The Staff's witness, Gerald E. Gears; a Senior Land-Use Analyst and NRC's member on the Interagency Advisory Committee on Electric Field Effects, gave testimony on electric field research efforts and results. CAND's witness James Amory, a farmer with some technical background in mathematics and engineering, testified in support of the contention.

Soviets have 150,000 kilometer-years of 500 kV transmission line operation, producing fields of 12-15 kV/m near ground level, without identifying any biological effects from the lines' electric fields. (Ibid. pp. 10-12.)

150. Soviet standards limit electric fields to 12 kV/m at points where lines cross roads and 15 kV/m elsewhere along unpopulated sections of the line routes. (Ibid. pp. 12-13.)

151. In three experimental studies involving human subjects exposed to conditions equivalent to high voltage lines with a ground strength of 12 kV/m or higher electric fields, no detrimental effects were observed. (Ibid. pp. 14-16.)

152. Results of ongoing animal research projects, with studies of mice, rats, monkeys, and swine, have so far been consistent with previous reports in finding no significant effects which would adversely influence the health of animals exposed to low-frequency fields up to 100 kV/m. (Ibid. pp. 16-25.)

153. There is no reason to believe that people with neurological disorders would be more sensitive than others because there has been no decrement of performance in test animals at very high levels of exposure. (Michaelson testimony, Tr. p. 1117.)

154. Magnetic fields can be discounted as a cause of cancer. Electrostatic fields may provide nonhazardous stimuli to animals or people, but tests for hazardous conditions, such as cardiovascular and immunologic changes have been negative. It is conceded that negative results may not be as meaningful statistically as positive results. (Ibid. pp. 1138-1147, 1152.)

155. The testimony of CAND's witness was based on hearings before the New York State Public Service Commission (1976-1978). In the belief that there are potentially harmful human effects from electric fields if a 500 kV line is utilized, the witness proposed an expansion of the right-of-way so that maximum field strength at the edge would be limited to 0.1 kV/m, and a requirement that Applicants inform people living near the right-of-way of potential hazards with respect to biological effects. Proposing a limit on field strength based on a safety factor of 100, the witness cites several studies referred to in the New York PUC cases in support of his position. (Amory ff. Tr. 1206 at pp. 1-3 and testimony Tr. pp. 1211-12.)

156. During redirect examination, the Applicants' witness reviewed the studies mentioned by CAND and pointed out their lack of statistical significance, poor experimental design, lack of reproducibility, inapplicability or lack of hazard significance. (Michaelson testimony, Tr. pp. 1227-37.)

157. The FES contains the Staff's conclusion that there is no evidence to date that the operation of 500 kV power lines will have any significant

biological effects on humans. The Applicant will install a phasing arrangement and increase structure height at highway crossings, if necessary, to limit the electrostatic field strength at ground level to 7.5 kV/m. A worst case gradient will be no greater than 7.83 kV/m and at the edge of the right-of-way, 2.4 kV/m or less. Adverse health effects on switchyard workers have been reported, but not for transmission line workers exposed to gradients well above 7.5 kV/m. There is no evidence to date indicating hazardous effects to plants or animals from present levels of fields generated from existing transmission line technology. (Staff Ex. No. 4, p. 4-9 and App. C, p. C-7.)

158. The values for electric field strength gradients of 11 kV/m on the right-of-way and 2.28 kv/m at the edges are acceptable since the fields are not strong enough to cause excessive tissue heating. A small number of studies have observed physiological and/or behavioral effects that may indicate possible adverse health effects in people. These studies have been challenged, however, because of poor experimental design and inadequate treatment of results. (Gears, ff. Tr. 1379 at pp. 4-5.)

159. The Interagency Advisory Committee on Electric Field Effects is guiding ongoing research funded by the Department of Energy on transmission line effects. This research has produced statistically significant results in areas of neonatal development, endocrinology, hematology, neurophysiology, neurochemistry, urine volume and chemistry, sympathetic nervous system, and behavior in tests on mice and rats where exposed for 120 days at scaled field strengths of 4-20 kV/m. While some data indicate statistically significant results in animals, the effects are so subtle and small in magnitude that further research is needed to determine if these effects are biologically significant and will adversely affect the test organisms. The general population would receive a long-term exposure of less than 2 kV/m, which is below the 4-20 kV/m reported above to cause statistically significant effects in rats and mice. (Ibid. pp. 5-7.)

160. The Applicants' 500 kV lines would be permitted by the Russian general population guidelines. (Ibid. p. 8.)

161. No evidence exists to date that the operation of 500 kV power lines will have an adverse biological health effect on humans. If ongoing research concludes protective measures are warranted, a variety of actions are available including increasing right-of-way widths, limiting field strengths at the edge and using shield wires or retrofitting techniques. (Ibid p. 9.)

162. Results of research on electric fields' effects on growth and development of plants and animals indicate that neither adverse injuries nor abnormalities were apparent from a 50 kV/m field; however, some barely perceptible physical damage was observed in some plants at 25 kV/m and

above. No changes in the Applicants' transmission line design are warranted. (Ibid. pp. 9-10.)

163. The 11 kV/m estimated by Applicants is in the realm of a maximum limit for a 500-525 kV line. (Gears Testimony, Tr. pp. 1381-82.)

164. There is insufficient evidence to believe transmission lines would have an adverse health effect on people. The Staff cannot prove conclusively there are no effects from electric fields, but do show that there is a preponderance of evidence to date showing that there have been no effects. (Gears Testimony, Tr. pp. 1386-89 and 1395-96.)

8. State and County Emergency Planning (Contention 20)

165. This contention challenges a number of the provisions of the emergency plans of the Commonwealth of Pennsylvania and Luzerne County. It alleges the provisions do not meet the recommendations and guidance of NUREG-0654 or some acceptable alternative.²²

166. No operating license for a nuclear power reactor will be issued unless a finding is made by NRC that the state of off-site emergency plans provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. The finding and determination that State and local emergency off-site plans are adequate and capable of being implemented is the responsibility of FEMA and these findings and determinations are reviewed by the NRC. Off-site emergency plans must meet NRC standards and criteria. (See 10 CFR 50.47(a)(1) and (2) and n. 1, and NUREG-0654 FEMA-REP-1, Rev. 1., Staff Ex. No. 7.)

167. Contention 20(1)(a):²³ The concept of operations in the emergency plan of Luzerne County (County) is set forth in detail and includes

²² Contention 20: "The emergency evacuation plans submitted by Luzerne County and the Commonwealth of Pennsylvania do not comply with the planning standards of 10 CFR Part 50.47(b) in that the recommendations and guidance of NUREG-0654 have not been satisfied as specified in Attachment A, nor has compliance been demonstrated through some other acceptable alternative means."

²³ 20(1)(a): NUREG-0654 REV. 1 (section A. 1, b.) recommends that each organization and suborganization having an operational role shall specify its concept of operations, and its relationship to the total effort. Luzerne County Civil Defense's local plan gives merely an outline of concept, leaving blank important information (page 6 of the Luzerne County plan) about telephone and dispatcher communications. Moreover, the Luzerne County plan (page 5; section 5) states that the "county conducts program of public education, training and exercise of emergency forces and posts route signs and evacuation." But the plan fails to mention when, where, and how the public education and exercises will take place. Nor does the plan mention where signs will be posted. The plan further states that the "radiological thyroid blocking chemicals are stocked." The plan fails to mention where and how the public will be informed of thyroid blocking chemicals or where they will be stored.

information on its communication capability. The plan includes specific information on public education and training programs and exercises, but not route signs, which are not specifically recommended by NUREG-0654. Provisions concerning thyroid blocking chemicals are included in the plan. (Commonwealth Ex. 9 and Annexes B, D, M, R, and S; Henderson, ff. Tr. 2546 at pp. 1-3; Belser *et al.*, ff. Tr. 2586 at pp. 6-8; Swiren, ff. Tr. 2671 at pp. 3-7.)

168. Contention 20(1)(b):²⁴ The Commonwealth (State) and County plans contain block diagrams that describe the interrelationships of organizations having an operational role. (Comm. Ex. 8, App. 3 and Ex. 9, App. 3; Henderson ff. Tr. 2546 at p. 4; Belser *et al.*, ff. Tr. 2586 at p. 8; Swiren, ff. Tr. 2671 at pp. 7-8.)

169. Contention 20(1)(c):²⁵ The County plan recognizes the overall responsibility of the County Commissioners and their appointment of a Director/Coordinator of Civil Defense to act for them in matters involving an emergency response. (Comm. Ex. 9, p. 5; Henderson, ff. Tr. 2546 at p. 5; Belser *et al.*, ff. Tr. 2586 at p. 9; Swiren, ff. Tr. 2671 at p. 8.)

170. Contention 20(2)(a):²⁶ The Luzerne County Chamber of Commerce is not mentioned or relied on in any way in the County emergency plan. (State Ex. 9, Annex C; Henderson, ff. Tr. 2546 at p. 6; Belser, *et al.*, ff. Tr. 2586 at pp. 9-10; Swiren, ff. Tr. 2671 at p. 9.)

171. Contention 20(2)(b):²⁷ The County plan contains a detailed public

²⁴ 20(1)(b): ... The state, and [Luzerne County plans] - do not meet the guidelines of NUREG-0654 REV. 1 (section A. 1. (c)) that requires each plan to illustrate these interrelationships [of organizations having an operational role] in a block diagram.

²⁵ 20(1)(c): NUREG-0654 (Section A. 1, d) recommends that each organization shall identify a specific individual by title who shall be in charge of the emergency response. The Luzerne County Civil Defense Plan states no such individual.

²⁶ 20(2)(a): NUREG-0654 (section A. 2, a) recommends that: "Each organization shall specify the functions and responsibilities for major elements and key individuals by title of emergency response, including the following: Alerting and Notification; Communication, Public Information; Accident Assessment; Public Health and Sanitation; Social Services; Fire and Rescue; Traffic Control. . . Luzerne County Civil Defense plan (page 11) states "see Annex E" for *communications* and goes on to state (page 11) they will notify Luzerne County Chamber of Commerce to pass to business and industry in affected area." Plan does not state how Chamber of Commerce would assume this responsibility. There is no such organization called Luzerne County Chamber of Commerce. Moreover, the plan does not suggest what will happen if a nuclear incident occurs when the Chamber of Commerce is not there to pass to business and industry, i.e., if accident occurs after 5:00 P.M. when offices would be closed.

²⁷ 20(2)(b): *Public Information* in Luzerne County Civil Defense plan is merely an outline (page 17 of LCCD plan). It lists in 4 brief lines:

1. Develop media release (Plan does not state who will do this nor for what purpose)
2. Brief local media (Plan does not state what media will be briefed about)
3. Operate various control centers (What does this have to do with public information)
4. Monitor Media (Plan does not state what media will be monitored about)

information section in annex D. It provides for distribution of pre-emergency protective action brochures, prepared statements to be broadcast during an emergency over an Emergency Broadcast System and the establishment of a news media center to brief the media, with responsibility being assigned to the person or persons to handle briefings and releases on emergency matters. Additional public information procedures are being considered. (State Ex. 9, Annex D; Henderson, ff. Tr. 2546 at p. 7, Testimony pp. 2547-55; Belser *et al.* ff. Tr. 2586 at pp. 10-11, Testimony Tr. pp. 2605-06, 2616-18, 2628-33; Swiren, ff. Tr. 2671 at pp. 10-11).

172. Contention 20(2)(c):²⁸ Responsibility for public health at the County level is assigned in the plan to the medical/health group and radiological decontamination group and for sanitation to the engineering group. These groups will be represented at the emergency operating facility. Training, participation in drills and exercises and relocation plans for fire and rescue companies are also provided for in the County plan. (State Ex. 9, V p. 9, par. 5 and 7; Henderson, ff. Tr. 2546 at p. 8; Belser *et al.*, ff. Tr. 2586 at pp. 11-12; Swiren, ff. Tr. 2671 at pp. 12-13.)

173. Contention 20(2)(d):²⁹ The County plan assigns responsibility for traffic control to State and Municipal police. The plan references a State Police Radiological Response Plan for the Susquehanna facility. The number of police and equipment in each municipality within the plume exposure pathway EPZ is listed and access and traffic control points assigned to State police are also indicated. (State Ex. 9, Annex F and App. 3, Annex K and App. 1; Henderson, ff. Tr. 2546 at p. 9; Belser, *et al.*, ff. Tr. 2586 at pp. 12-13; Swiren, ff. Tr. 2671 at p. 14).

174. Contention 20(2)(e):³⁰ The County plan lists the number of ambulances available within the County, the hospital and nursing homes that can be evacuated and a list of hospitals in the surrounding area capable of providing radiation treatment. The dispatching of ambulance resources is under the direction of the County's Communication Center.

²⁸ 20(2)(c): *Public Health and Sanitation* is not mentioned in LCCD plan. *Fire and Rescue*: Utility plant (page 5-8) states there will be one drill per calendar quarter and (page 8-3) states local fire and rescue companies will be invited to participate in a training program. LCCD plan (page 13) merely outlines "Fire & Rescue Group" in 3 sentences, stating "units evacuating from affected area will report to facilities in Annex D." Annex D is not included in plan, nor is there any clear delineation of who the fire companies are.

²⁹ 20(2)(d): . . . *Traffic Control*: Luzerne County Civil Defense plan gives an outline of traffic control under "Police Group." It does not list what "units" are available for traffic control.

³⁰ 20(2)(e): . . . Luzerne County Civil Defense plan gives a mere outline of responsibilities of medical groups. (Page 15 of LCCD plan.) There are no names of medical organizations who would be involved in an evacuation. Under LCCD's general evacuation, it states they will evacuate Saint Stanislaus Home to _____ and evacuate invalids whose evacuation requires use of ambulance. The LCCD plan does not tell us who the ambulance associations are nor if they are equipped to handle such an emergency.

Evacuation places for ambulatory and nonambulatory persons are shown. The relocation site for St. Stanislaus Home has not been selected as yet. (Comm. Ex. 9, Annexes G and I; Henderson, ff. Tr. 2546 at p. 10; Belser *et al.*, ff. Tr. 2586 at pp. 13-14; Swiren, ff. Tr. 2671 at p. 15.)

175. Contention 20(2)(f):³¹ The plan contains a chart of primary and support responsibilities. (State Ex. 9, App. 2, p. 2-1; Henderson, ff. Tr. 2546 at p. 11, Belser *et al.* ff. Tr. 2586 at p. 16; Swiren, ff. Tr. 2671 at p. 14).

176. Contention 20(3)(a):³² There is no responsibility assigned in the County plan to the Chamber of Commerce. Primary notification or alerting is to be accomplished through the use of sirens which cover most of the plume exposure pathway EPZ. Municipal response plans, most of which are completed, are to contain door-to-door notification procedures. Separate letters of agreement between municipalities and the County are not planned. (State Ex. 9, Annex C; Henderson, ff. Tr. 2546 at pp. 12-13; Belser *et al.* ff. Tr. 2586 at pp. 14-15; Swiren ff. Tr. 2671 at pp. 17-18).

177. Contention 20(3)(b):³³ The County plan provides a procedure for notification and message verification and describes the information that will be communicated to the public during an emergency. The Chairman of the County Board of Commissioners or his designee is to be the spokesperson during an emergency and briefings are to be provided that person by PEMA's Information Officer. There is a provision for coordinating information and also updating information. (State Ex. 9, Annex C,

³¹ 20(2)(f): NUREG-0654 (section A. 2a) cites the description of these [emergency response] functions shall include a clear and concise summary such as a table of primary and support responsibilities. None of the above, from Communications to Emergency Medical — fulfills this recommendation.

³² 20(3)(a): NUREG-0654 REV. 1 "Notification Methods and Procedures" (page 43) recommends "the content of initial and follow-up messages to response organization and the public has been established and means to provide early notification and clear instruction to the populace." Luzerne County Civil Defense plan (page 6) cites under both selective evacuation and general evacuation that "County will notify Chamber of Commerce to pass on notification to business and industry." There is no clear outline of how this will be accomplished and no letters of agreement appear between Civil Defense and Chamber of Commerce. Cited under general evacuation (Luzerne County plan, page 6), political subdivisions will be responsible for door to door notification within political boundaries. There is no mention of how this notification would be executed within political subdivision(s) nor who would be responsible for such notification if a general evacuation is called. There are no letters of agreements with political subdivisions to assume that responsibility of notification.

³³ 20(3)(b): NUREG-0654 (section E. 1., page 43) recommends that procedures for notification include means for verification of messages. Luzerne County plan makes no mention of any verification of messages. Luzerne County plan does not meet the recommendations of NUREG-0654 (appendix 3 page 3-2) which states "plan should give a description of the information that would be communicated to the public under given circumstances, for continuing instruction on emergency actions to follow, and updating of information."

App. 5 and Annex D and App. 1-6; Henderson, ff. Tr. 2546 at p. 14; Belser *et al.* ff. Tr. 2586 at pp. 15-16; Swiren, ff. Tr. 2671 at pp. 18-20).

178. Contention 20(4)(a):³⁴ Both the State and County plans propose periodic dissemination of information to the public including information on radiation protection measures, and needs of the handicapped. The County plan provides for the advance release of public information, designates a spokesperson in the County and also provides for the coordination of the dissemination of information to the public through assignment of responsibilities, briefing procedures and establishment of messages to be broadcast over the emergency broadcast system. (State Ex. 9, Annex D, Ex. 8, App. 15; Henderson, ff. Tr. 2546 at pp. 15-17; Belser *et al.* ff. Tr. 2586 at pp. 16-18; Swiren, ff. Tr. 2671 at pp. 20-21.)

179. Contention 20(5)(a):³⁵ Both the State and County plans call for monitoring off-site to be performed by the BRP. (State Ex. 9, Annex M and Ex. 8, p. 28; Henderson, ff. Tr. 2546 at p. 18; Swiren, ff. Tr. 2671 at p. 22; Belser *et al.* ff. Tr. 2586 at p. 18).

180. Contention 20(5)(b):³⁶ The State plan provides for the number of sets of radiological monitoring equipment and reserves at its area offices. It prescribes that emergency equipment is to be inspected and operationally checked at least annually and provides for inventories to be taken after each use. (State Ex. 8, App. 8; Henderson, ff. Tr. 2546 at p. 19; Reilly, ff. Tr. 2434 at p. 4; Swiren, ff. Tr. 2671 at p. 23).

³⁴ 20(4)(a): NUREG-0654 (section G. 1. page 49) recommends that each organization shall provide a coordinated periodic dissemination of information to the public. It shall include:

- (a) education information on radiation
- (b) protection measures
- (c) special needs of the handicapped.

Neither the State plan nor the Luzerne County Civil Defense plan gives any mention to periodic dissemination of information to the Public. Luzerne County Civil Defense plan doesn't meet NUREG-0654 section G 2 (Requirement) to see that the public information program should include provision for written material that is likely to be available in a residence during an emergency. Nor does Luzerne County plan meet NUREG-0654 (section G.4.a.) recommendation designating a spokesperson who should have access to all necessary information. Luzerne County plan gives no provision for the planning standard of NUREG-0654 (Section G), which states "procedures for coordinated dissemination of information to the public are established." Luzerne County plan gives 4 brief lines to "Public Information."

³⁵ 20(5)(a): NUREG-0654 Rev. 1 (H 7, p. 54) states that "each organization, where appropriate, shall provide for off-site radiological monitoring equipment in the vicinity of the nuclear facility." The Luzerne County plan makes no provision for such equipment.

³⁶ 20(5)(b): NUREG-0654 REV. 1 (H 10, p. 54) recommends that "each organization shall make provisions to inspect, inventory and operationally check emergency equipment/instruments at least once each calendar quarter and after each use. There shall be sufficient reserves of instrument/equipment to replace those that are removed from emergency kits for calibration or repair." The State plan does not meet this recommendation since it does not mention inspection, inventory, or checking of such equipment, nor does it mention reserves. . . .

181. Contention 20(5)(c):³⁷ Neither the State nor County plan identifies emergency kits by general category. PEMA does maintain an inventory of all equipment that would be available in the event of an incident. The County has an inventory of radiological monitoring sets it has on hand. (State Ex. 9, App. 6, Annex M; Henderson, ff. Tr. 2546 at p. 20; Belser *et al.* ff. Tr. 2586 at p. 20; Swiren, ff. Tr. 2671 at pp. 23-24.)

182. Contention 20(6)(a):³⁸ Under State and County plans, field monitoring is to be performed by the BRP. The type of equipment that will be utilized and reference to the location of monitoring sites is included in Appendix 8 of the State plan. (State Ex. 8; Henderson, ff. Tr. 2546 at p. 21; Belser *et al.*, ff. Tr. 2586 at pp. 20-21; Swiren, ff. Tr. 2671 at p. 25).

183. Contention 20(6)(b):³⁹ The State has the capability for detecting and measuring radioiodine concentrations at a greater capability than the guidance of NUREG-0654. (Henderson, ff. Tr. 2546 at p. 22; Reilly, ff. Tr. 2434 at p. 7; Swiren, ff. Tr. 2671 at pp. 25-26.)

184. Contention 20(6)(c):⁴⁰ The State plan refers in Appendix 8 to the procedures for determining contamination levels, dose rates and water and contamination levels and comparing those parameters to EPA Protective Action guides. Dose projections for specific isotopes are detailed in a

³⁷ 20(5)(c): NUREG-0654 REV. 1 (H 11, p. 54) recommends that "each plan shall, in an appendix, include identification of emergency kits by general category (protective equipment and emergency supplies)." The State plan and (Luzerne) County plan both fail to meet this recommendation since they do not include this information in an appendix or elsewhere.

³⁸ 20(6)(a): NUREG-0654 Rev. 1 (I 7, p. 57) recommends that "each organization shall describe the capability and resources for field monitoring within the plume exposure Emergency Planning Zone which are an intrinsic part of this concept of operations for the facility." The Luzerne County plan makes no provision for such monitoring. The State plan provides for such monitoring, but omits specifics such as type of equipment, number of fixed monitoring sites or their location. With respect to in-place surveillance, the State plan (DER, p. XIV-1) states that "Generally these include air samplers and TLD's" which is too vague to comply with the NUREG recommendations.

³⁹ 20(6)(b): Referring to the . . . state, NUREG-0654, REV. 1 (I 9, p. 58) states "each organization shall have a capability to detect and measure radioiodine concentrations in air in the plume exposure EPZ as low as 10^{-7} μ Ci/cc (microcuries per cubic centimeter) under field conditions." . . . (The State (plan does not) mention whether (it has) this capability.

⁴⁰ 20(6)(c): NUREG-0654, REV. 1 (I 10, p. 58) recommends that the . . . State "establish means for relating the various measured parameters (e.g. contamination levels, water, and air activity levels) to dose rates for key isotopes" and provide "for estimating integrated dose from the projected and actual dose rates and for comparing these estimates with the protective action guides." The recommendation states that the "detailed provisions shall be described in separate procedures." (The plan) fail(s) to meet this recommendation by being too vague about the procedures to be used, failing to mention specific isotopes, and not referring to detailed provisions in separate procedures. The State plan (DER, p. XIII-2) says "estimates of direct population exposure from the passing cloud and from ground deposition are made from in place air samples (sic) and from energy compensated TLD's."

separate BRP procedure. The State plans to use the U.S. Department of Energy capability to track from the air and to maintain a computer record for periodic estimation of total population exposure. (State Ex. 8 and Ex. 4; Reilly, ff. Tr. 2434 at pp. 8-10; Henderson, ff. Tr. 2546 at p. 23; Swiren, ff. Tr. at pp. 26-27).

185. Contention 20(7)(a):⁴¹ As already stated, the plan does not rely on the Chamber of Commerce. Maps with monitoring locations have been prepared and due to size are referenced as to location in the State plan. A map with mobile air sampling locations is still in preparation. A list of bus contacts and some pickup points for persons without automobiles is included in the County plan. Availability of buses and additional pickup points await completion of written school and municipal plans. A map showing reception center locations is in the County plan and the map showing mass care centers is in the still under development. (State Ex. 9, Annex I, App. 4; Henderson ff. Tr. 2546 at pp. 24-25; Reilly, ff. Tr. 2434 at p. 11; Swiren, ff. Tr. 2671 at pp. 28-29.)

186. Contention 20(7)(b)⁴² and (7)(c):⁴³ The State plan provides for the stockpiling, distribution and administering of thyroid blocking agents and

⁴¹ 20(7)(a): The Luzerne County plan would not adequately protect the public in the plume exposure pathway EPZ, as required by NUREG-0654 Rev. 1 (J), in part because the County plan has in some cases assigned tasks to organizations that do not exist or are not aware of having been assigned such tasks:

1) The County plan states (pp. 6, 11, 12) that in the event of a decision to take cover or evacuate, the County will notify the "Luzerne County Chamber of Commerce" to pass notification to business and industry. No organization by this name exists.

2) The County plan states (p. 7-8) "individuals with no transportation may request same through local fire companies. Commercial buses will be dispatched to local fire stations in the affected area to transport these individuals." The County did not consult either the fire companies or bus companies before including this procedure in the plan, or inform them of having included it.

Maps are not provided by . . . the . . . County (or) State showing, "preselected radiological sampling and monitoring points, relocation centers in host areas, and shelter areas" as required by NUREG-0654, Rev. 1 (J 10a, p. 61).

⁴² 20(7)(b): In the State plan (PEMA, p. 10) assigning to the State Department of Health the responsibility to "Develop procedures for stockpiling, in adequate supply (distributing), and administering thyroid blocking agents and such other radiological health materials as may be required" does not meet the requirement either as it states that (1) thyroid blocking chemicals are to be stocked (p. 5), (2) the county medical officer will coordinate the distribution with the State Department of Health (p. 7), and (3) the county medical group will assist the State Department of Health to their distribution (p. 15) but gives no more specifics.

⁴³ 20(7)(c): Neither the State or (Luzerne) County plan meet the requirements of NUREG-0654, Rev. 1 (J 10f, p. 63) that "State and local organizations' plans should include the method by which decisions by the State Health Department for administering radioprotective drugs to the general public are made during an emergency and the pre-determined conditions under which such drugs may be used by offsite emergency workers." Neither plan addresses these decision making issues at all.

for the predistribution of such agents and lists the organizations and quantities they are to receive. The Commission does not plan to issue these drugs to the general public. (State Ex. 8, App. 9; Ex. 9, Annex M; Henderson, ff. Tr. 2586 at p. 26; Reilly testimony, Tr. 2469-73; Belser *et al.* ff. Tr. 2596 at pp. 23-24; Swiren, ff. Tr. 2671 at pp. 30-32.)

187. Contention 20(7)(d):⁴⁴ The means of evacuating school children and those without transportation await the completion of written school plans. School pickup points and reception centers are identified in the County plan. (State Ex. 9, Annex N and Annex J; Swiren, Tr. 2674-76; Chesnut, Tr. 2691-94; Swiren ff. Tr. 2671 at pp. 33-34).

188. Contention 20(7)(e):⁴⁵ The State plan places a responsibility on support counties to provide mass care facilities. The County plan identifies four support Counties and lists mass care facilities and their capabilities within Luzerne County. The County plans include mass care facilities for fifty (50) percent of those evacuating and assigns the number of individuals to be accommodated in each mass care County. Agreements have been executed with the County for the local Red Cross Chapters to operate the mass care facilities and agreements are being executed with the support Counties. (State Ex. 8, p. 29 and Ex. 9, Annexes L and T; Henderson, ff. Tr. 2546 at pp. 29-30; Belser *et al.* ff. Tr. 2586 at pp. 26-27; Swiren, ff. Tr. 2671 at pp. 34-35.)

⁴⁴ 20(7)(d): The State and (Luzerne) County plans meet the recommendation of NUREG-0654, Rev. 1 (J 10g p. 63) that they specify the "means of relocation." The County plan (pp. 7-8) states "individuals with no transportation may request same through local fire companies. Commercial buses will be dispatched to local fire stations", . . . [but does not] specify the logistics of the procedure. It states (p. 7) "schools will be evacuated by school authorities with school bus transportation to designated schools outside the 10-mile area," but does not name the schools outside the 10-mile EPZ, name the designated schools to which the children are to be evacuated, or specify whether the capacity of the schools' buses are sufficient to evacuate the students without making return trips.

⁴⁵ 20(7)(e): The State and (Luzerne) County plans do not meet the recommendation of NUREG-0654, Rev. 1 (J 10h, p. 63) that they include "relocation centers in host areas" since neither plan names specific relocation centers. The County plan (p. 7) states "Red Cross will open reception centers at _____, _____, _____, and mass care centers in County to accommodate 18,000 persons." The capacity of 18,000 persons is inadequate since the population of the 10-mile EPZ is 47,171 (PEMA, Appendix 1a, p. 1). The plan does not state that the Red Cross is capable of staffing adequate relocation centers.

189. Contentions 20(7)(f),⁴⁶ (7)(g)⁴⁷ and (7)(h)⁴⁸: The Applicant has completed an evacuation time study which will be incorporated into the State and County plans. The study is based on a road network provided by State and local officials and traffic capacities under different time scenarios and climatic conditions. The study considers traffic impediments and traffic control points are identified which State Police will handle to overcome potential bottlenecks. The National Guard also will be used to help remove obstacles and control traffic if necessary and the State Department of Transportation has the basic responsibility for removing obstacles to traffic flow on main evacuation routes. (State Ex. 8, VIIA pp. 23-25; Henderson, ff. Tr. 2545 at pp. 31-33; Belser, *et al.*, ff. Tr. 2586 at pp. 27-29; Swiren, ff. Tr. 2671 at pp. 36-38).

190. Contention 20(7)(i):⁴⁹ The BRP is responsible for assessing the incident and recommending appropriate protective action to responsible State authorities. The basis for the choice of actions is set forth in the State plan and the time analysis results for evacuation as a possible choice of action will be incorporated into the State plan. (State Ex. 8, App. 8; Henderson ff. Tr. 2546 at p. 34; Reilly ff. Tr. 2434 at pp. 12-13 and Testimony, Tr. pp. 2460-64.)

⁴⁶ 20(7)(f): Neither the State nor the (Luzerne) County plan includes "projected traffic capacities of evacuation routes under emergency conditions" as required by NUREG-0654, Rev. 1 (J 10i, p. 63).

⁴⁷ 20(7)(g): Neither the State nor the (Luzerne) County plan includes "identification of and means for dealing with potential restrictions to the use of evacuation routes to include alternates" is assigned to the Department of Transportation, and DER, Bureau of Radiation Protection's plan states (p. VIII 4) "bad weather will also obviously influence the feasibility of evacuation, thereby making sheltering and other options attractive." The County plan only states (p. 7) that "based primarily on police and PennDot advice, modifications and detours will be made to evacuation routes as situations develop."

⁴⁸ 20(7)(h): Neither the State nor the (Luzerne) County plan includes "time estimates for evacuation of various sectors and distances based on a dynamic analysis (time-motion study under various conditions) for the plume exposure pathway emergency planning zone" as recommended by NUREG-0654, Rev. 1 (J 101, p. 63). The State plan only assigns to PEMA the function "continue to assess time estimates for protective action responses and update procedures with an objective of reducing actual response times to the extent possible" (PEMA, p. 12).

⁴⁹ 20(7)(i): The plans of the . . . State do not adequately meet the recommendation of NUREG-0654, Rev. 1 (J 10m, p. 64) that they contain "the bases for the choice of recommended protective actions from the plume exposure pathway during emergency conditions. This shall include expected local protection afforded in residential units or other shelter for direct and inhalation exposure, as well as evacuation time estimates."

191. Contention 20(7)(j):⁵⁰ Responsibility for registering and monitoring evacuees is provided for in State and County plans. (State Ex. 5 and Ex. 8, App. 16 and Ex. 9, Annexes L and M; Henderson, ff. Tr. 2546 at p. 35; Belser *et al.* ff. Tr. 2586 at pp. 29-30; Swiren, ff. Tr. 2671 at pp. 39-40).

192. Contention 20(7)(k):⁵¹ The State plan contains a procedure that provides for the collection and analysis of environmental samples and comparison with protective action guides for food, water and milk so that appropriate protective responses can be evaluated and recommended. The Pennsylvania Department of Agriculture revised its plan to include implementing protective measures in the ingestion pathway and this will be included in the State's plan. The BRP has maps of monitoring locations and the revision of the Department of Agriculture's plans include maintaining site specific maps in the ingestion exposure pathway EPZ with relevant information on livestock, food processors and water supply systems. Lists of names and locations of milk, food, and agricultural product processors are available for use. (State Ex. 6, and Ex. 8, App. 7 and 8;

⁵⁰ 20(7)(j): Neither the State nor the (Luzerne) County plan meets the recommendation of NUREG-0654, Rev. 1 (J 12, p. 65) that "each organization shall describe the means for registering and monitoring of evacuees at location centers in host areas." The State plan (PEMA, p. 10) only assigns to the State Department of Environmental Resources the responsibility to "provide for the monitoring of evacuees at relocation centers." The County plan mentions (p. 14) initiating a "human locator system for transients in area" but does not mention registering or monitoring other evacuees.

⁵¹ 20(7)(k): The State plan does not adequately specify protective actions for the ingestion exposure EPZ. In particular, it fails to meet the following recommendations of NUREG-0654, Rev. 1 (J 11, p. 64):

1) The recommendation that "the plan shall identify procedures for detecting contamination" is not met by the plan stating "collection and analysis of environmental materials will be useful in evaluating the ingestion pathway." (DER, p. XIV-2).

2) It is recommended that the plan "identify procedures . . . for imposing protective procedures such as impoundment, decontamination, processing, decay, product diversion, and preservation." The plan discusses the protective procedures mentioned, but fails to specify mechanisms for imposing and enforcing any of them. It states, "protocol for the implementation of any protective action involving dairy products or any agriculture product will require the evaluation of the circumstances with the appropriate agency of the Pennsylvania Department of Agriculture." (DER, p. IX-1).

3) For the 50-mile ingestion pathway EPZ (there is no mention (of) "maps for recording survey and monitoring data, key land use data (e.g., farming), dairies, food processing plants, water sheds, water supply intake and treatment plants and reservoirs" except to state that "a map of dairy herd locations is given in the specific site plan" (DER, p. XIV-2), which is not included.

4) The plan does not include or mention "up-to-date lists of the name and location of all facilities which regularly process milk products and other large amounts of food or agricultural products originating in the ingestion pathway emergency planning zone, but located elsewhere."

Henderson, ff. Tr. 2546 at p. 36-39; Reilly Testimony, Tr. pp. 2474-76; Belser, *et al.*, ff. Tr. 2586 at pp. 30-31; Swiren, ff. Tr. 2671 at pp. 40-42).

193. Contention 20(8)(a-f):⁵² The State plan in Appendix 16 and County plan in Annex M provide procedures for radiation exposure control for emergency workers. They require reading times of dosimeters and the recording of dose information. Both plans establish procedures for limiting exposures and the County plan provides a specific method for authorizing work above an acceptable dose level. The State plan in Appendices 8 and 16 and the County in Appendix 1 to Annex M establish the same action level for requiring decontamination monitoring. Decontamination is a County responsibility but the State provides guidance and procedures in Appendix 16. The County plan for decontamination is in Annex M and will be carried out by trained personnel in mass care centers. Medical facilities for those requiring it are identified in Annex G. The recommendations of NUREG-0654 as they apply to Contentions 20(d-f) are not in issue since those provisions apply to the licensee (Applicants) alone. (State Ex. 8, App. 8 and 16, and Ex. 9, Annex M; Henderson, ff. Tr. 2546 at pp. 40-45; Belser, *et al.*, ff. Tr. 2586 at pp. 32-34; Swiren ff. Tr. 2671 at pp. 42-45).

194. Contention 20(9)(a-b):⁵³ Lists of hospitals capable of providing evaluation and medical support services for contaminated individuals are listed in State and County plans. Primary and support hospitals are named

⁵² 20(8)(a-f) Section K - Radiological Exposure Control

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| (a) | 3.b. | No mention of how this should be done in . . . (the State or Luzerne County) plans. In State plans it is generally stated that the Department of Environmental Resources shall be in charge of radiological protective and health matters but nothing specific. |
| (b) | 4. | No such decision chain in any of the plans. |
| (c) | 5.a. | The DER, Bureau of Radiation Protection, is to provide guidance in all such matters, but there is no specific plan. No mention in . . . (Luzerne) County plans. |
| (d) | b. | Same as above. |
| (e) | 6.a.b.c. | No mention. |
| (f) | 7. | No mention. |

⁵³ 20(9)(a-b): The State and (Luzerne) County plans do not adequately make arrangements for medical services for contaminated injured individuals. Specifically, they do not meet the following recommendations of NUREG-0654, Rev. 1 (p. 69):

- (a) "L1) Each organization shall arrange for local and backup hospital services having the capability for evaluation of radiation exposure and uptake, including assurance that persons providing these services are adequately prepared to handle contaminated individuals.
- (b) L3) Each state shall develop lists indicating the location of public, private and military hospitals and other emergency medical facilities within the State or contiguous states considered capable of providing medical support for any contaminated individual.

and the bed capacity indicated. (State Ex. 8, App. 9 and Ex. 9, App. 3; Henderson, ff. Tr. 2546 at pp. 46-47; Belser, *et al.*, ff. Tr. 2586 at pp. 34-35; Swiren, ff. Tr. 2671 at pp. 45-46).

195. Contention 20(10)(a):⁵⁴ The County's plan in Annex P contains a detailed procedure for reentry and recovery operations which generally follows the same procedure as that used for evacuation. (State Ex. 9, Annex P, Henderson, ff. Tr. 2546 at p. 48; Belser, *et al.*, ff. Tr. 2586 at p. 35; Swiren, ff. Tr. 2671 at pp. 46-47).

196. Contention 20(10)(b):⁵⁵ The State plan provides for implementing a reentry and recovery operation. (State Ex. 8, App. 17; Henderson, ff. Tr. 2546 at p. 49; Belser, *et al.*, ff. Tr. 2586 at pp. 35-36; Swiren, ff. Tr. 2671 at pp. 47-48).

197. Contention 20(11)(a-b):⁵⁶ The County plan provides for drills and exercises and the State plan provides for night-time exercises, unannounced exercises and exercises under various weather conditions. (State Ex. 9, Annex S and Ex. 8; App. 14; Henderson, ff. Tr. 2546 at pp. 50-51; Belser, *et al.*, ff. Tr. 2586 at p. 36; Swiren, ff. Tr. 2671 at pp. 48-49).

⁵⁴ 20(10)(a): The Luzerne County plan fails to adequately meet the reentry and recovery planning recommendations of NUREG-0654, Rev. 1 (M, p. 70). Beyond stating that Pennsylvania Department of Environmental Resources Bureau of Radiological Health "will establish and disseminate appropriate reentry criteria" (p. 18), the only other reference to reentry and recovery in the County plan (p. 7) "reentry to evacuated areas will be denied to all but residents who will be accompanied by mobile patrol, Pa. driver's license will be used as identification, and police cordon blocking entry to evacuated area will make maximum use of local police to facilitate identification of area residents" and (p. 19) "reentry will be based on advise (sic) of BRH, DER. Evacuated area will be denied to individuals not holding Pa. driver's license showing them to be a resident of the area. Residents of the area will be allowed entry accompanied by mobile patrol only with the exception granted by Chief Police Group Luzerne County CD. Emergency services of the area for a period of time before reentry to the general public is authorized."

⁵⁵ 20(10)(b): The plans of the . . . State do not (meet) the NUREG-0654, Rev. 1, recommendation (M 3, p. 70) that "each . . . State plan shall specify means for informing members of the response organizations that a recovery operation is to be initiated, and of any changes in the organizational structure that may occur."

⁵⁶ 20(11)(a): NUREG-0654 Rev. 1 recommends (N, p. 71) that "periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted." The Luzerne County plan fails to meet this recommendation, as it makes no mention of exercises or drills, except to list an annex entitled "Training and exercises," which is not included.

20(11)(b): NUREG-0654 Rev. 1 (N 1b) recommends that "each organization should make provisions to start an exercise between 6:00 p.m. and midnight and another between midnight and 6:00 a.m. once ever 6 years." The plans of the . / . State fail to make this provision. NUREG-0654 Rev. 1 (N 1b, p. 71) "exercise should be conducted under various weather conditions." The plans of the State both fail to specify this. NUREG-0654 Rev. 1 (N 1b) states "some exercises should be unannounced." The state plan makes no mention of having some unannounced exercises. . . .

198. Contentions 20(11)(c-e):⁵⁷ The State plan calls for quarterly testing of communications between Federal emergency response organizations and States within the ingestion exposure pathway EPZ. The State plan calls for an annual testing of communications between the nuclear facility, State and local emergency operation centers and field assessment teams. Communication drills also contain a message content understanding requirement. (State Ex. 8, App. 14; Henderson, ff. Tr. 2546 at pp. 52-54; Belser, *et al.*, ff. Tr. 2586 at pp. 36-37; Swiren, ff. Tr. 2671 at pp. 49-50).

199. Contentions 20(12)(a-d):⁵⁸ The State and County plans provide for radiological response training for emergency response personnel. The State's plan does not mention retraining but it is referred to in the County plan. (State Ex. 8, App. 10 and Ex. 9, Annex R; Henderson, ff. Tr. 2546 at p. 55; Belser, *et al.*, ff. Tr. 2586 at pp. 38-41; Swiren, ff. Tr. 2671 at pp. 50-51).

200. Contentions 20(13)(a-i):⁵⁹ The County plan provides training of those responsible for the planning effort, for the individuals responsible for training and for the designation of an emergency planning coordinator with

⁵⁷ 20(11)(c): The state plan (PEMA, Rev. 6/80) states (p. 14-1) that "communication with federal emergency response organizations and states within the ingestion pathway shall be tested annually," whereas NUREG-0654, Rev. 1 (N 2a) recommends this is to be done quarterly.

20(11)(d): NUREG-0654 Rev. 1 (N 2a, p. 72) states that "communications between the nuclear facility, state and local emergency operations centers, and field assessment teams shall be tested annually." . . . (T)he state plan . . . (does not) mention the involvement of field assessment teams in exercises or drills.

20(11)(e): NUREG-0654 Rev. 1 (N 2a, p. 72) states "communication drills shall also include the aspect of understanding the content of (messages)." . . . (T)he state's plan . . . (does not) mention including this aspect in drills.

⁵⁸ 20(12)(a-d): *Section O - Radiological Emergency Response Training*

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| (a) | 1. | State plan just gives general objectives in Appendix 10. In the (Luzerne) County plan, Annex M is listed "Training and Exercises" but there is no Annex M (see p. 21). |
| (b) | 1.b | Same as above for state and county plans. |
| (c) | 4.a-j | Same as above for state and county plans. |
| (d) | 5. | Same as above for state and county plans. |

⁵⁹ 20(13): *Section P - Responsibility for the Planning Effort: Development, Periodic Review and Distribution of Emergency Plans*

- | | | |
|-----|----|---|
| (a) | 1. | (Luzerne) County plans same as in Section O. |
| (b) | 2. | (Luzerne County plans do not) mention. |
| (c) | 3. | (Luzerne County plans do not) mention. |
| (d) | 4. | State plan fails to mention that they will "certify it to be current on an annual basis." |
| (e) | 5. | (N)o mention in state plan. |
| (f) | 6. | (N)o mention in state plan. |
| (g) | 7. | (N)o mention in state plan. |
| (h) | 8. | (N)o mention in state plan. |
| (i) | 9. | (N)o mention of this in . . . (state or Luzerne County) plans. |

responsibility for developing, updating and coordinating emergency plans with State and utility plans. The State has assigned responsibility for maintaining and updating the State plan and for distributing changes to the State plan. It lists only some of the implementing procedures required to implement the plan and contains an appendix which however does not reference the sections of the plan to be implemented by each procedure. The plan does contain a specific table of contents with a cross reference to NUREG-0654. The recommendations of the planning standards and criteria of P. 9 of NUREG-0654 do not apply to Contention 20(13)(i) since the guidance of that section is only for the licensee, and not the State or County. (State Ex. 9, Para. V.A. p. 5 and Annex R and Ex. 8, para. VI B and C, p. 8 and para X, p. 30 and App. 18; Henderson, ff. Tr. 2546 at pp. 56-64; Belser, *et al.*, ff. Tr. 2586 at pp. 41-44; Swiren, ff. Tr. 2671 at pp. 51-54).

9. Scram Discharge Volume Break (Contention 21)

201. This contention, sponsored by intervenors SEA and CAND, reads as follows:

21. There is a potentially dangerous flaw in the Applicants' reactor in the design of the primary cooling system inasmuch as radioactive water from a break in the scram discharge volume subsystem can disable the major safety systems including the residual heat removal system, the reactor core isolation cooling system, the core sprays and the high pressure coolant injection pumps in a brief period of time.

202. Only the Applicants and NRC Staff presented direct cases on this contention.⁶⁰

203. The SDV is part of the Control Rod Drive ("CRD") system. The CRD system at Susquehanna is used to implement a reactor scram by inserting control rods into the reactor core. Upon actuation of the scram signal, water from the volume above each of 185 CRD pistons is discharged into a CRD withdrawal line, goes through a scram exhaust valve,

⁶⁰ Applicants' witness was Mr. Thomas M. Crimmins, Jr., Manager, Nuclear Plant Engineering, for Pennsylvania Power and Light Company, who directs engineering and design activities and systems and safety analyses for the Susquehanna Steam Electric Station, Units 1 and 2. The NRC Staff's witness was Mr. Kenneth T. Eccleston, a Project Manager in the Division of Licensing, Office of Nuclear Reactor Regulation, who was responsible for coordinating the final review of the safety concerns associated with pipe breaks in the BWR scram system and the issuance of NUREG-0803, Generic Safety Evaluation Report Regarding Integrity of BWR Scram System Piping.

and is ultimately collected in one of the two SDVs. (Crimmins, ff. Tr. 1685, at pp. 2-3).

204. The scram exhaust valves are normally closed, and hence, the system downstream is normally dry and not pressurized. They open upon receipt of the scram signal and remain open until the scram signal is reset. As the scram exhaust valves open, water is discharged through the CRD withdrawal lines into the SDVs. Each SDV has vent and drain valves, both of which are normally open but close upon receipt of a scram signal. The SDVs partially fill with the water discharged during the scram; when the scram system is reset by the operator, the scram exhaust valves close and the SDV vent and drain valves open, draining the contents of the SDV into the reactor building sump. The SDV then drains and returns to atmospheric pressure, ready for reuse in the next scram. (Ibid. pp. 3-4).

205. In an NRC Staff study on pipe breaks in BWR scram systems (NUREG-0785), a sequence of events was postulated in which a pipe break in the SDV could result in loss of all emergency core cooling systems ("ECCS"). This result assumed that the fluid discharged from the SDV break would flow to the reactor building basement through a variety of paths, including floor drains, stairways and hatchways above the ECCS equipment. The ECCS failure was assumed to be caused by cascading of water onto the ECCS pump motor assemblies or due to general flooding of the ECCS pump rooms, which are located in the reactor building basement. (Ibid. pp. 1-2.)

206. An evaluation of the problem on a generic basis was provided recently by the NRC Staff in NUREG-0803 which identified three general areas of concern with respect to SDV piping breaks: (1) integrity of the SDV piping; (2) emergency procedures to successfully mitigate a leak or break in the SDV or elsewhere in the secondary containment; (3) environmental qualification of equipment needed to detect and mitigate the consequences of an SDV break. The guidance proposed a series of site-specific responses. Applicants have committed to comply with the recommendation NUREG-0803, and are committed to have submitted a detailed response by December 29, 1981. (Bd. Ex. 1, p. 1; Crimmins Testimony, Tr. p. 1758; Eccleston Testimony, Tr. 1776; Eccleston, ff. Tr. 1772, at pp. 3, 5.)

207. The initiating event, a break in the SDV piping, has a very low probability of occurrence. The SDVs are designed to high material quality and fabrication standards, and are subjected to in-service inspection in accordance with ASME code requirements. (Crimmins, ff. Tr. 1685, at pp. 3-4). The SDVs at Susquehanna are highly resistant to cracking, fatigue, corrosion, brittle fracture and other anticipated mechanical failure mechanisms. (Ibid. pp. 3-4; Staff Exhibit No. 5, pp. 3-3 to 3-6).

208. Assuming an SDV break does take place, if the scram is reset through operator action, no adverse consequences will occur because resetting terminates the flow of liquid to the SDV and hence the release of water to the reactor building sump. Under certain conditions (e.g., drywell high pressure, main steamline high radiation), the scram signal cannot be quickly cleared by the operator and further measures will be required to mitigate an SDV break. However, experience to date indicates that inability to reset the scram is unlikely to occur. (Crimmins Testimony, Tr. pp. 1767-68; Staff Ex. No. 5, pp. 4-9 and 4-10; Crimmins, ff. Tr. 1685 at p. 5).

209. If scram resetting does not take place, it becomes necessary to identify and isolate the leak and, if required, depressurize the system. An SDV leak or break at Susquehanna would be detected and brought to the attention of the operators by the leak detection system. Indication of a leak would be given by one or more of the following: area radiation monitor alarms, reactor building sump level alarm, reactor building exhaust vent high radiation alarms, loss of reactor building ventilation alarms, ECCS and reactor core isolation cooling system ("RCIC") pump room level alarms, control rod drive high temperature alarm, reactor building differential pressure indicator, and control rod position indicator. (Crimmins, ff. Tr. p. 1685, at pp. 4-5; Staff Ex. No. 5, pp. 4-3, 4-4; Crimmins Testimony, Tr. pp. 1761-62).

210. While some of these alarms and indicators may not establish unambiguously that an SDV break exists, taken in combination (as they are most likely to occur in the event of a significant leak) they would provide an unmistakable warning that a leak was originating from the SDV. This would be sufficient to produce remedial actions by the operators. (Crimmins Testimony, Tr. pp. 1695, 1763-64; Eccleston, Tr. 1787, 1815; Staff Ex. No. 5, pp. 4-4 to 4-7).

211. If the scram cannot be reset, operating procedures include depressurizing the system and proceeding to isolate the leak manually. The aim of depressurizing the reactor system is to reduce the rate of leakage and minimize inventory losses and radioactive releases to the containment environment. (Crimmins, ff. Tr. 1685, at p. 5; Crimmins Testimony, Tr. pp. 1699, 1762; Staff Ex. No. 5, p. 4-10).

212. By the time depressurization is completed, personnel would be able to enter the reactor building to isolate the SDV manually. A radiological field of some strength will exist in the building as a result of the leak, but appropriately equipped personnel will be able to enter the building and manually close the isolation valves without receiving doses in excess of 10 CFR Part 20 limits. (Crimmins Testimony, Tr. pp. 1707, 1756; Eccleston Testimony Tr. 1793-95, 1818.)

213. While corrective actions are being taken to eliminate the leak from the SDV break, the operators' prime goal will be maintaining adequate core cooling. As long as the reactor remains pressurized, the preferred method for providing core cooling is through the main feedwater pumps, the condensate pumps and the condenser. All of these systems are located in the turbine building and are physically isolated from the location of the break, hence, they would not be subject to flooding. (Crimmins, ff. Tr. 1685, at pp. 4-5.)

214. Following depressurization, the residual heat removal ("RHR") system provides low-pressure injection. The RHR pumps are located in the basement of the reactor building and theoretically could be subject to flooding; however, there are RHR service water pumps located in the emergency service water pumphouse, physically isolated from the reactor building and therefore not subject to flooding. Thus, if all other sources of makeup water (including the RHR system) were depleted or unavailable, the RHR service water pumps could deliver water from the 25 million gallon spray pond. (Ibid. pp. 4-5; Crimmins Testimony, Tr. pp. 1764-65).

215. Both the main feedwater pumps and the RHR service water pumps are controlled remotely from the control room. Together, they provide adequate, independent, and physically remote capability to preserve core cooling following an SDV break. (Crimmins, Testimony, ff. Tr. 1685, p. 5.)

216. Other systems capable of maintaining adequate core cooling are the high pressure coolant injection system ("HPCI") and the RCIC system, both of which provide independent core cooling capability at high pressure. After depressurization, in addition to the RHR system, the low pressure core spray ("LPCS") system can provide adequate core cooling capability. (Crimmins, ff. Tr. 1685, at pp. 4-6; Staff Ex. No. 5, pp. 413 to 4-15.)

217. The HPCI system pump, the RCIC system pump, the four RHR system pumps, and the four LPCS pumps are all located in the reactor building basement at Susquehanna. Any of these 10 pumps can provide sufficient coolant to make up for the inventory loss following an SDV break. (Crimmins, ff. Tr. 1685 at pp. 4-6; Staff Ex. No. 5, pp. 4-14, 4-15).

218. At Susquehanna, all of the above systems, including their respective pumps, are located in compartments which are watertight with respect to each other. In addition, the stairwells are also provided with watertight doors which isolate them from the equipment. Therefore, even if flooding of the reactor building basement occurs, it would be a localized event that will not disable all safety systems located in the basement. (Crimmins, ff. Tr. 1685, at p. 4.)

219. If, in spite of the watertight condition of the reactor building basement rooms and stairwells at Susquehanna, general area flooding were to occur, it would take several hours to flood the basement to a one-foot depth, even assuming that leak tightness is defeated, the reactor building sump pumps are inoperative, and no leakage reduction results from depressurization. (Crimmins, ff. Tr. 1685, at p. 6; Eccleston testimony, Tr. pp. 1829-30.)

220. All motors driving emergency core cooling system pumps at Susquehanna are six feet above the basement floor. Therefore, the level of flooding that would result from an SDV break, even under very conservative assumptions, would not result in loss of those motors until many hours from the onset of the accident, if at all. (Crimmins, ff. Tr. 1685 at p. 6; Eccleston Testimony, Tr. p. 1829; Crimmins Testimony, Tr. p. 1702.)

IV. CONCLUSIONS OF LAW

221. The Board has considered all of the evidence submitted by the parties and the entire record of this proceeding. Based on the findings of fact set forth herein, which are supported by reliable, probative and substantial evidence in the record, this Board, having decided all matters in controversy, concludes that, pursuant to 10 CFR 2.760a and 10 CFR 50.57, the Director of Nuclear Reactor Regulation should be authorized to issue to the Applicants, upon making requisite findings with respect to matters not embraced in this Initial Decision, licenses that authorize operation of the Susquehanna Steam Electric Station, Units 1 and 2.

ORDER

222. Wherefore, it is ordered that the Director of Nuclear Reactor Regulation is authorized, upon making requisite findings with respect to matters not embraced in this Initial Decision, in accordance with the Commission's regulations, and upon making the findings required in paragraph 223, 2 and 3, to issue to Applicants, operating licenses for a term of not more than forty (40) years, authorizing operation of the Susquehanna Steam Electric Station, Units 1 and 2, at steady-state power levels not to exceed 3293 megawatts thermal. Such licenses may be in such form and content as is appropriate in light of such findings, provided that such licenses are consistent with the conclusions of the Licensing Board herein.

223. The aforementioned operating licenses shall contain the following conditions:

1. The licenses will be subject to the ultimate outcome of the consolidated radon proceeding currently underway before the Appeal Boards in Docket Nos. 50-277, 50-278, 50-320, 50-354, and 50-355.

2. The licenses will be subject to a finding by the Director of Nuclear Reactor Regulation, in consultation with the Federal Emergency Management Agency, that all school districts within the plume exposure pathway emergency planning zone for the Susquehanna Steam Electric Station have completed written emergency plans to respond to fixed nuclear facility accidents.

3. The licenses will be subject to a finding by the Director of Nuclear Reactor Regulation, in consultation with the Federal Emergency Management Agency, that all municipalities within the plume exposure pathway emergency planning zone have completed their emergency response plans on transportation resources and program.

224. It is further ordered that this Initial Decision shall constitute the final action of the Commission forty-five (45) days after the issuance thereof, subject to any review pursuant to 10 CFR 2.760, 2.762, 2.764, 2.785, and 2.786.

225. Exceptions to this Initial Decision may be filed within ten (10) days after its service. A brief in support of the exceptions shall be filed within thirty (30) days thereafter and forty (40) days in the case of the Staff. Within thirty (30) days of the filing and service of the brief of the Appellant, and forty (40) days in the case of the Staff, any other party may file a brief in support of, or in opposition to, the exceptions.

IT IS SO ORDERED.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Paul W. Purdom
ADMINISTRATIVE JUDGE**

**Glenn O. Bright
ADMINISTRATIVE JUDGE**

**James P. Gleason, Chairman
ADMINISTRATIVE JUDGE**

Dated at Bethesda, Maryland,
this 12th day of April, 1982.

APPENDIX

1. Exhibits received into evidence:

Staff No. 1 — Safety Evaluation Report, Susquehanna, Units 1 and 2, NUREG-0776.

Staff No. 2 — Safety Evaluation Report Supplement 1, NUREG-0776.

Staff No. 3 — Safety Evaluation Report Supplement 2, NUREG-0776.

Staff No. 4 — Final Environmental Statement, Susquehanna, Units 1 and 2, NUREG-0564.

Staff No. 5 — Generic Safety Evaluation Report, BWR Scram System Piping, NUREG-0803.

Staff No. 6 — Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping, NUREG-0313, Rev. 1.

Staff No. 7 — Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power plants, NUREG-0654, FEMA-REP-1, Rev. 1.

Commonwealth No. 1 — State Bureau of Radiation Protection Plan for Nuclear Power Generating Station Incidents, Revision 3.

Commonwealth No. 2 — Susquehanna Steam Nuclear Power Plant Sampling Locations.

Commonwealth No. 3 — Field Airborne Iodine Sampling Procedure.

Commonwealth No. 4 — Estimation of Radiological Consequences of Airborne Radioactive Material for Ground Level Sources.

Commonwealth No. 5 — Pennsylvania Emergency Management Directive No. 32, Development of a Mass Care Operational Program.

Commonwealth No. 6 — Ingestion Exposure Pathway Emergency Planning Zone, Appendix 11.

Commonwealth No. 7 — Schools and Colleges Emergency Plans, Appendix 11.

Commonwealth No. 8 — Commonwealth of Pennsylvania Disaster Operations Plan, Annex E, Fixed Nuclear Facility Incidents.

Commonwealth No. 9 — Draft Luzerne County Radiological Emergency Response Plan for Incidents at the Susquehanna Steam Electric Station, Berwick, Pennsylvania, August 1981.

Board No. 1 — Letter to Staff, dated September 17, 1981, committing Applicants' compliance with NUREG-0803 by December 29, 1981.

Board No. 2 — Letter to Staff, dated June 30, 1981, containing Applicants' response to NRC generic letter 81-03 and NUREG-0313.

Board No. 3 — Letter to Staff, dated September 15, 1981, containing Applicants' response to NRC generic letter 81-03 and NUREG-0313.

2. Professional Qualifications of Witnesses received into evidence:

Applicant		Staff		Commonwealth		CANDs	
Witness	Trans- script page	Witness	Trans- script page	Witness	Trans- script page	Witness	Trans- script page
Michaelson	1043	Feldman	1344	Reilly	2434	Amory	1206
Weinstein	1259	Karlowicz	1401	Lamison	2586		
Keiser	1570	Prasad	1525	Belser	2586		
Tosetti	1596		2196	Comey	2586		
Vanderslice	1619	Bangart	1648	Hippert	2586		
Crimmins	1684	Loysen	1655				
Englehart	1849	Eccleston	1772				
Lemaire	1915	Fisher	1880				
Rhoades	1938	Branagan	1894				
McNair	1948	Struckmeyer	1894				
Hecht	2049	Litton	1927				
Henderson	2309	Chesnut	2517				
Cantone	2382	Swiren	2519				
McCandless	2248	Gears	1379				
Carroll	2308						

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

James P. Gleason, Chairman
ADMINISTRATIVE JUDGE

Bethesda, Maryland
April 30, 1982

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Marshall E. Miller, Chairman
Gustave A. Linenberger, Jr.
Dr. Cadet H. Hand, Jr.

In the Matter of

Docket No. 50-537

**UNITED STATES DEPARTMENT OF
ENERGY
PROJECT MANAGEMENT
CORPORATION
TENNESSEE VALLEY AUTHORITY
(Clinch River Breeder Reactor Plant)**

April 14, 1982

The Licensing Board confirms its rulings made during a conference of counsel for the parties and sets forth a list of contentions admitted for hearing.

ORDER FOLLOWING CONFERENCE WITH PARTIES

A conference with counsel was held pursuant to notice in this proceeding on April 5-6, 1982 at Bethesda, Maryland. Counsel representing the United States Department of Energy, Project Management Corporation and Tennessee Valley Authority (Applicants), the Staff, Natural Resources Defense Council and Sierra Club (Intervenors), and the State of Tennessee participated in the conference.

The Board considered and heard arguments on the Revised Statement of Contentions and Bases filed by the Intervenors on March 5, 1982. Responses and objections had been filed subsequently by Applicants and Staff. The Board also considered and ruled upon all motions regarding discovery then pending.

All parties agreed that the evidentiary hearing commencing August 24, 1982 would concern only LWA-1 issues (Tr. 425, 445). The Staff stated that it was on schedule for the June 22 issuance of the environmental

update report and for the July 9 issuance of the site suitability safety issues report. The Staff also stated that since LWA-2 safety matters will not be covered by the site suitability report, there is an improved chance that the document will be issued in late June, 1982 (Tr. 246-247).

Applicants and Intervenors agreed that the time for responses to requests for admissions would be the same as the time provided under the regulations regarding replies or answers to interrogatories, namely 14 days, plus one day allowance for expedited delivery of responses (Tr. 66-67).

Admissibility of Contentions

The Board determined the admissibility of the Intervenors' proposed contentions, which were set forth in their Revised Statement of Contentions and Bases. These proposed contentions included contentions as originally admitted in 1976, revised contentions, and new contentions. All Admitted and Renumbered Contentions are set forth in Appendix 1, thereto, and they are incorporated herein by reference. In considering these contentions at the conference, they were referred to as numbered in the Revised Statement of Contentions and Bases. They were renumbered if admitted.¹

Contention 1

Contention 1 asserted that the application is illegal because as a matter of law the LWA procedure is inapplicable to first-of-a-kind reactors such as the CRBR.

The Board denied Contention 1. The Board believes that as a matter of law, the LWA procedures do apply to the CRBR proceeding. Further, the denial of this contention as a pleading will not prejudice Intervenors because the applicability of LWA regulations can be challenged by proposed conclusions of law after a factual record has been developed at the evidentiary hearing. The contention as framed presents an ultimate legal question for the Board following the taking of evidence, rather than a factual issue or pleading (Tr. 98).

Contention 2

Contention 2, concerning the envelope of design basis accidents (DBAs) as including the core disruptive accident (CDA), was admitted. It was renumbered Admitted Contention 1 (Tr. 125).

¹ Discussion of contentions commences at Tr. 75.

Contention 3

Contention 3, concerning the adequacy of the analyses of CDAs by Applicants and Staff, was admitted. It was renumbered Admitted Contention 2. The Board overruled objections by Applicants and Staff, holding that language added by the Intervenors to the previously admitted (1976) contention only added to the clarity of the contention and did not expand its scope (Tr. 135).

Contention 4

Contention 4, alleging that neither Applicants nor Staff has given sufficient attention to CRBR accidents other than the DBAs, was admitted. It was renumbered Admitted Contention 3. The Board overruled objections by Applicants and Staff to the addition of subsection (d), which concerns the factor of human error in accident analysis, finding there was sufficient specificity and nexus to the "lessons learned from TMI" to be considered by the Board (Tr. 142).

Contention 5

Contention 5, alleging that neither Applicants nor Staff adequately analyze the health and safety consequences of acts of sabotage, terrorism or theft directed against the CRBR or supporting facilities nor adequately analyze preventive programs, was admitted. It was renumbered Admitted Contention 4 (Tr. 148).

Contention 6

Contention 6, which questions the suitability of the site selected for the CRBR and suggests that an alternative site would be preferable, was admitted as revised to include reference to the Y-12 plant and references to population considerations (Tr. 149). It was renumbered Admitted Contention 5. The Board overruled objections by the Applicants and Staff to the addition of the reference to the Y-12 plant, finding that the Y-12 plant raises significant concerns involving public health and safety, in the context of alternative sites being preferable. The Board further noted that the inquiry into this Y-12 plant will not be qualitatively different from the inquiry into the other facilities mentioned in the original contention (Tr.

184). The Board overruled objections by the Applicants and Staff to the addition of references to "population density," "population characteristics" and "population disadvantages" on the grounds that consideration of population factors was reasonably within the scope of the contention as previously admitted in 1976 (Tr. 162).

Contention 9

Contention 9, which alleges that the SER and the FES do not include an adequate analysis of the environmental impact of the fuel cycle associated with the CRBR, was admitted. It was renumbered Admitted Contention 6 (TR. 210).

Contention 10

Contention 10, which alleges that neither Applicants nor Staff has adequately analyzed alternatives to the CRBR, was admitted. It was renumbered Admitted Contention 7. Subparagraph (a)(5) was renumbered as subparagraph (a)(3); subparagraph (d) was renumbered as subparagraph (b); and subparagraph (g) was renumbered as subparagraph (c) (Tr. 213).

Contention 14

Contention 14, which alleges that neither the unavoidable adverse environmental effects nor the costs associated with the decommissioning of the CRBR have been adequately analyzed by Applicants and Staff in the NEPA cost/benefit analysis, was admitted. It was renumbered Admitted Contention 8 (Tr. 233).

Contention 16

Contention 16, which alleges that neither Applicants nor Staff has given adequate attention to the presence of radioactive sediments already present in the Clinch River, was denied because the contention was untimely and the showing necessary for an untimely filing of a new contention was not made. The information necessary to set forth this contention was available to Intervenor in 1977 and the contention could and should have been pleaded at that time. The rules for filing an untimely contention (10 CFR §2.714) require a showing of good cause which, in this case, has not been shown (Tr. 271).

In determining whether to admit an untimely contention, the Board must consider the five factors set forth in 10 CFR §2.714(a)(1).²

Good cause for failure to file this contention has not been shown. The ER in 1976 addressed the monitoring of the Clinch River sediments, and for that reason NRDC was put on notice to this issue. The fact that a later document "triggered" NRDC to reexamine the 1976 ER does not suffice to meet the good cause factor.

A failure to show good cause for late filing means that the petitioner carries a heavier burden with respect to the other four factors. With respect to factors (ii) and (iii), the Board believes that the requirement that the ER contain a preconstruction radiological monitoring program, a construction radiological monitoring program and an operational radiological monitoring program and the requirement that the cost/benefit analysis in the FES consider the radiological effects of the facility and alternatives weigh against admittance of the contention. The substance of Intervenor's contention, concern regarding radioactive sediments existing in the Clinch River, will be addressed in these documents. Although the Intervenor's interest will not be represented by existing parties (factor iv), the Board does not believe this factor should be given much weight in light of the fact that the ER and FES must consider the radioactive sediments in the river.

Finally, with respect to factor (v), admittance of this contention would delay the proceeding by adding further areas of discovery and litigation to an already tight schedule.

Contention 17

Contention 17, which questions the availability of fuel for the CRBR, was denied as a matter of law. This contention concerns a policy or programmatic issue which, in accordance with the guidelines set forth by the Commission in its earlier decision,³ is outside the permissible scope of this proceeding. The contention involves questions of DOE policy and future actions which go wholly beyond the proper issues relevant to this particular plant⁴ (Tr. 283-4).

² (i) Good cause, if any, for failure to file on time.

(ii) The availability of other means whereby the petitioner's interest will be protected.

(iii) The extent to which the petitioner's participation will be expected to assist in developing a sound record.

(iv) The extent to which the petitioner's interest will be represented by existing parties.

(v) The extent to which the petitioner's participation will broaden the issues or delay the proceeding.

³ CLI-76-13, 4 NRC 67, 78, 83-6, 92 (1976).

⁴ *Id.*, at 89.

Contention 18

Contention 18, which addresses the adequacy of the Applicants' quality assurance program, was amended to strike the following language appearing at the end of the first paragraph: "or that such program would protect the public health and safety adequately even if it complies with NRC requirements." The Board granted the amendment, but denied Intervenor's request to file the contention at this time. Quality assurance is an important matter that might be pleaded at the construction permit stage, rather than at the LWA stage. The denial of Contention 18 at this time will not bar Intervenor from filing a contention at the construction permit stage which addresses these matters with the specificity, bases and good cause which the Board feels is now lacking (Tr. 293).

Contention 19

Contention 19, which addresses the adequacy of Applicants' plans for coping with emergencies, was admitted by the Board and renumbered Admitted Contention 9 after the Board struck the following language at the end of the first paragraph:

"or that such plans would protect the public health and safety adequately even if they comply with NRC requirements."

However, the Board determined that this contention was premature for action at the LWA-1 phase, and therefore ordered that discovery and other actions by the parties with respect to this contention be deferred until after the evidentiary hearing and partial initial decision (Tr. 308).

Contention 20

Contention 20, concerning CRBR accidents beyond the design basis, was withdrawn by Intervenor after the Board indicated that the issues raised by Contention 20 are cognizable under previously Admitted (1976) Contentions 1, 2 and 3 (Tr. 330-331).

Contention 21

Contention 21, challenging the adequacy of Applicants' proposed system for classifying and categorizing postulated DBA's, was withdrawn by

Intervenors after the Board indicated that the issues raised by Contention 21 are cognizable under previously Admitted (1976) Contentions 1, 2, and 3 (Tr. 339).

Contention 22

Contention 22, alleging that neither Applicants nor Staff has demonstrated that the design of the containment reduces offsite doses during accidents to a level that is as low as reasonably achievable, was denied as a matter of law. The Board held that the ALARA regulations do not apply to accidents, but only to normal reactor operations. If at some future time the Commission changes the regulations, Intervenors may then be entitled to raise the question. The Board is bound by the existing regulations, and ALARA principles do not apply in the manner sought to be established by Intervenors (Tr. 341-342).

Contention 23

Contention 23, alleging that neither Applicants nor Staff has demonstrated that the facility will be provided with systems necessary to establish and maintain containment integrity capable of performing their functions during and after being exposed to certain specified environmental conditions, was admitted. It was renumbered Admitted Contention 10. However, all discovery and other actions relating to Contention 10 are deferred until after the LWA-1 evidentiary hearing and partial initial decision (Tr. 344).

Contention 24

Contention 24, alleging that neither Applicants nor Staff has shown that the CRBR can be constructed at the proposed location without undue risk to the health and safety of the public, was withdrawn by Intervenors after the Board indicated that the substance of Contention 24 is cognizable under Admitted Contention 2 (Tr. 346).

Contention 8

Contention 8, concerning the health and safety consequences which may occur if the CRBR merely complies with current NRC standards for

radiation protection of the public health, was admitted as modified. All parties agreed to a change in the language appearing in the second line of 8(d)(1) from "once in a lifetime organ dose" to "10 CFR §100.11 organ dose." The contention was renumbered Admitted Contention 11 (Tr. 362-363).

Agreements Regarding Discovery

All parties agreed to the following schedule for discovery prior to the LWA-1:

All parties will serve their first round of discovery, encompassing all requests relating to old contentions, by April 15, 1982, and will answer these requests by April 30, 1982, the date specified in the Board's Prehearing Order of February 11, 1982 (Tr. 367). In addition, all responses to discovery filed in the 1975-1977 period will be updated and served by April 30, 1982 (Tr. 368).

During the second round of discovery running from April 30 to June 18, 1982, the parties will proceed with follow-up discovery on questions relating to old contentions, and will conduct initial discovery with respect to new contentions. The discovery relating to new contentions will include new parts to old contentions, and will involve two rounds of discovery — a first set of questions seeking to elicit basic information and then any follow-up that is necessary (Tr. 368-369). Intervenors agreed to conduct discovery during the follow-up period on a contention-by-contention basis with respect to Applicants. Therefore, Applicants will receive all follow-up questions relating to each contention at the same time.

In addition, Intervenors agreed to try to develop a schedule for the follow-up discovery. This schedule would not necessarily bind Intervenors, but would set targets to allow the Applicants to plan for responses to discovery (Tr. 370).

Intervenors agreed to provide Staff with all the follow-up discovery requests at once, as Staff preferred. Staff agreed to answer interrogatories during this period, April 30 to June 18, 1982, on a 14-day turnaround basis. In addition, Intervenors need not go to the Board in the first instance for permission to conduct discovery on the Staff (Tr. 370).

All parties agreed that during the follow-up period, there may be a mix of discovery (Tr. 370). Parties may proceed by deposition rather than by interrogatory with respect to all matters, or utilize requests for admissions where such procedure is more efficient (Tr. 370-371).

Finally, all parties reserved the right to object to particular discovery requests on substantive grounds, *i.e.*, they may raise legal objections to

specific questions but not to this overall approach (Tr. 371). In addition, Staff reserved its right to object to a request on the grounds appearing in 10 CFR §2.720(h)(2)(ii) — that the answer is not necessary to the decision in this case or that the information is obtainable elsewhere. Staff agreed to give Intervenors 10 days notice if it intends to object or seek a protective order on those grounds (Tr. 380-381).

Motions

Applicants' March 29, 1982 Motion For A Protective Order

The Board considered and heard arguments on Applicants' Motion for a Protective Order, dated March 29, 1982 with regard to NRDC's (1) Sixteenth Set of Interrogatories, (2) Ninth Request for Admissions, and (3) Fifth Request for Production of Documents, all of which were served on March 18.⁵ The Board denied a protective order with respect to the discovery requests for information relating to Applicants' and EPA's position with regard to proposed occupational exposure limits. The Board granted NRDC's discovery request subject to the understanding that we will not permit a challenge to the occupational dose limit values set forth in 10 CFR Part 20. This is discovery going to certain effects in an accident sequence under 10 CFR §100.11. To the extent that the information NRDC seeks is illuminative as to a proper way to approach the question of exposures to actinides, we feel that this discovery is appropriate (Tr. 399-400).

All discovery requests regarding fuel availability were considered moot because the contention regarding fuel availability, old Contention 17, was not admitted. Intervenors withdrew voluntarily the following requests for admissions: 11, 13, 14, 20 and 22-24 because they related to old Contention 22, concerning the application of the ALARA principle to accidents, which was denied by the Board. The Board ordered Intervenors to strike the corresponding requests to the Staff. The Board ruled that Applicants shall answer the remaining requests concerning the ALARA principle because those requests are relevant to Admitted Contention 11(a), which also concerns the ALARA principle (Tr. 410).

⁵ The Board's ruling on objections to discovery request applies to Staff as well as to Applicants where Staff has made the same objection as Applicants to a discovery request (Tr. 400-401).

Finally, the Board ruled that Interrogatories 4 and 5, appearing at pages 7 and 8 of the Sixteenth Set of Interrogatories, and the request for production of documents at pages 1 and 2 of the Fifth Request for Production of Documents, which relate to Admitted Contention 4, need not be answered. These interrogatories and requests concern the adequacy of safeguards at DOE, DOD and NRC licensed facilities and are beyond the scope of the purpose for which Contention 4 was admitted — a NEPA cost/benefit analysis (Tr. 413).

Applicants' April 2, 1982 Motion For A Protective Order

The Board considered and heard arguments on Applicants' April 2, 1982 Motion for a Protective Order in regard to NRDC's Seventeenth Set of Interrogatories and Request to Produce to the Applicants. NRDC's Twenty-Third Set of Interrogatories to the Staff contained the corresponding interrogatories to the Staff. The Board sustained objections to the series of interrogatories addressed to safeguards in these sets of interrogatories. It is the Board's belief that this series of interrogatories goes well beyond the scope of permissible discovery with regard to safeguards. Applicants shall answer Interrogatories 1 and 19 of their set of interrogatories and Staff shall answer Interrogatories 1 and 20 of their corresponding set of interrogatories. No objection was raised as to these interrogatories (Tr. 421-432).

Objections To NRDC's Twenty-Second Set Of Interrogatories To The Staff And Motion For A Protective Order Of April 2, 1982

Staff's objections to NRDC's Twenty-Second Set of Interrogatories to the Staff were resolved by the parties. Those interrogatories which were identical to interrogatories disallowed against the Applicant were disallowed against the Staff (Interrogatories 4(a) through (e) and 5(a) and (b) under old Contention 5, Admitted Contention 4, and Interrogatories 7 and 8 under old Contention 8, Admitted Contention 11) (Tr. 431-432). The Staff withdrew objections to Interrogatories 3, 4, 5 and 9 because they were of the same nature as 7 and 8, which had been resolved by the Board. The Staff withdrew its objections to old Contention 24 based upon the understanding that the substance of Contention 24 was subsumed by Admitted Contention 2. The Staff withdrew objections to Interrogatories 10-12 based upon its understanding that such interrogatories became appropriate when Contention 8(d) was admitted as Contention 11(d) (Tr.

431-432). The Staff took a similar approach with respect to old Contention 23, Admitted Contention 10. The Staff and Intervenors agreed that interrogatories relating to Contention 10 are conceivably relevant to parts of Admitted Contentions 1, 2 and 3 (Tr. 430). Since the Board deferred discovery with respect to Contention 10 until after the LWA-1 evidentiary hearing and partial initial decision, a ruling as to which interrogatories will also be deferred will be delineated by the Board at the conference to be held on Tuesday, April 20, 1982, in Bethesda, Maryland.

Final Matters

All parties agreed that Contentions 4, 5, 6, 7, 8, and 11(a)-(d) were litigable at the LWA-1 stage and that 11(a) be deferred until the CP stage. The Board ruled that Contentions 9 and 10 were deferred for litigation and discovery until after the LWA-1 evidentiary hearing and partial initial decision (Tr. 435-437, 440-442). The parties were unable to resolve their differences at this conference as to which matters relating to Contentions 1, 2 and 3 were discoverable at the LWA-1 phase.

The Board and counsel for all parties will reconvene on Tuesday, April 20, 1982, Bethesda, Maryland for the purpose of ruling upon which matters will be addressed in ongoing discovery relating to Contentions 1, 2 and 3, and which will be deferred until after the LWA-1 evidentiary hearing and partial initial decision. The Board advised counsel to file more than two days in advance of the conference all written material which they wish to have considered at the conference (Tr. 465).

If any discrepancies exist between statements made by the Board at the conference and this Order, this Order shall be controlling.⁶

It is so ORDERED.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Marshall E. Miller, Chairman
ADMINISTRATIVE JUDGE**

Dated at Bethesda, Maryland
this 14th day of April, 1982.

⁶ Dr. Cadet H. Hand, Jr. was unable to attend this conference because of teaching commitments at the University of California (Berkeley), but he requested the Board to proceed by a quorum. Judge Hand studied the Transcript and participated in the preparation of this Order, in which he concurs.

APPENDIX I
ADMITTED AND RENUMBERED CONTENTIONS

1. The envelope of DBAs should include the CDA.
 - a) Neither Applicants nor Staff have demonstrated through reliable data that the probability of anticipated transients without scram or other CDA initiators is sufficiently low to enable CDAs to be excluded from the envelope of DBAs.
 - b) Neither Applicants nor Staff have established that Applicants' "reliability program" even if implemented is capable of eliminating CDAs as DBAs.
 - (1) The methodology described in the PSAR places reliance upon fault tree and event tree analysis. Applicants have not established that it is possible to obtain sufficient failure mode data pertinent to CRBR systems to validly employ these techniques in predicting the probability of CDAs.
 - (2) Applicants' projected data base to be used in the reliability program is inadequate. Applicants have not established that the projected data base encompasses all credible failure modes and human elements.
 - (3) Even if all of the data described in Applicants' projected data base is obtained, Applicants have not established that CDAs have a sufficiently low probability that they may be excluded from the CRBR design bases.
 - (4) Applicants have not established that the test program used for their reliability program will be completed prior to Applicants' projected date for completion of construction of the CRBR.
2. The analyses of CDAs and their consequences by Applicants and Staff are inadequate for purposes of licensing the CRBR, performing the NEPA cost/benefit analysis, or demonstrating that the radiological source term for CRBRP would result in potential hazards not exceeded by those from any accident considered credible, as required by 10 CFR §100.1(a), fn. 1.
 - a) The radiological source term analysis used in CRBRP site suitability should be derived through a mechanistic analysis. Neither Applicants nor Staff have based the radiological source term on such an analysis.
 - b) The radiological source term analysis should be based on the assumption that CDAs (failure to scram with substantial core disruption) are credible accidents within the DBA envelope, should place an upper bound on the explosive potential of a

- CDA, and should then derive a conservative estimate of the fission product release from such an accident. Neither Applicants nor Staff have performed such an analysis.
- c) The radiological source term analysis has not adequately considered either the release of fission products and core materials, e.g. halogens, iodine and plutonium, or the environmental conditions in the reactor containment building created by the release of substantial quantities of sodium. Neither Applicants nor Staff have established the maximum credible sodium release following a CDA or included the environmental conditions caused by such a sodium release as part of the radiological source term pathway analysis.
 - d) Neither Applicants nor Staff have demonstrated that the design of the containment is adequate to reduce calculated offsite doses to an acceptable level.
 - e) As set forth in Contention 8(d), neither Applicants nor Staff have adequately calculated the guideline values for radiation doses from postulated CRBRP releases.
 - f) Applicants have not established that the computer models (including computer codes) referenced in Applicants' CDA safety analysis reports, including the PSAR, and referenced in the Staff CDA safety analyses are valid. The models and computer codes used in the PSAR and the Staff safety analyses of CDAs and their consequences have not been adequately documented, verified or validated by comparison with applicable experimental data. Applicants' and Staff's safety analyses do not establish that the models accurately represent the physical phenomena and principles which control the response of CRBR to CDAs.
 - g) Neither Applicants nor Staff have established that the input data and assumptions for the computer models and codes are adequately documented or verified.
 - h) Since neither Applicants nor Staff have established that the models, computer codes, input data and assumptions are adequately documented, verified and validated, they have also been unable to establish the energetics of a CDA and thus have also not established the adequacy of the containment of the source term for post accident radiological analysis.
3. Neither Applicants nor Staff have given sufficient attention to CRBR accidents other than the DBAs for the following reasons:
- a) Neither Applicants nor Staff have done an adequate, comprehensive analysis comparable to the Reactor Safety Study

- (“Rasmussen Report”) that could identify other CRBR accident possibilities of greater frequency or consequence than the accident scenarios analyzed by Applicants and Staff.
- b) Neither Applicants’ nor Staff’s analyses of potential accident initiators, sequences, and events are sufficiently comprehensive to assure that analysis of the DBAs will envelope the entire spectrum of credible accident initiators, sequences, and events.
 - c) Accidents associated with core meltthrough following loss of core geometry and sodium-concrete interactions have not been adequately analyzed.
 - d) Neither Applicants nor Staff have adequately identified and analyzed the ways in which human error can initiate, exacerbate, or interfere with the mitigation of CRBR accidents.
4. Neither Applicants nor Staff adequately analyze the health and safety consequences of acts of sabotage, terrorism or theft directed against the CRBR or supporting facilities nor do they adequately analyze the programs to prevent such acts or disadvantages of any measures to be used to prevent such acts.
- a) Small quantities of plutonium can be converted into a nuclear bomb or plutonium dispersion device which if used could cause widespread death and destruction.
 - b) Plutonium in an easily usable form will be available in substantial quantities at the CRBR and at supporting fuel cycle facilities.
 - c) Analyses conducted by the Federal Government of the potential threat from terrorists, saboteurs and thieves demonstrate several credible scenarios which could result in plutonium diversion or releases of radiation (both purposeful and accidental) and against which no adequate safeguards have been proposed by Applicants or Staff.
 - d) Acts of sabotage or terrorism could be the initiating cause for CDAs or other severe CRBR accidents and the probability of such acts occurring has not been analyzed in predicting the probability of a CDA.
5. Neither Applicants nor Staff have established that the site selected for the CRBR provides adequate protection for public health and safety, the environment, national security, and national energy supplies; and an alternative site would be preferable for the following reasons:
- a) The site meteorology and population density are less favorable than most sites used for LWRs.

- (1) The wind speed and inversion conditions at the Clinch River site are less favorable than most sites used for light-water reactors.
 - (2) The population density of the CRBR site is less favorable than that of several alternative sites.
 - (3) Alternative sites with more favorable meteorology and population characteristics have not been adequately identified and analyzed by Applicants and Staff. The analysis of alternative sites in the ER and the Staff Site Suitability Report gave insufficient weight to the meteorological and population disadvantages of the Clinch River site and did not attempt to identify a site or sites with more favorable characteristics.
- b) Since the gaseous diffusion plant, other proposed energy fuel cycle facilities, the Y-12 plant and the Oak Ridge National Laboratory are in close proximity to the site an accident at the CRBR could result in the long term evacuation of those facilities. Long term evacuation of those facilities would result in unacceptable risks to the national security and the national energy supply.
6. The ER and FES do not include an adequate analysis of the environmental impact of the fuel cycle associated with the CRBR for the following reasons:
- a) The ER and FES estimate the environmental impacts of the fuel cycle based upon a scale-down of analyses presented in the LMFBR Program Environmental Statement and Supplement for a model LMFBR and fuel cycle. The analyses of the environmental impacts of the model LMFBR and fuel cycle in the LMFBR Program Statement and Supplement are based upon a series of faulty assumptions.
 - b) The impacts of the actual fuel cycle associated with CRBR will differ from the model LMFBR and fuel cycle analyzed in the LMFBR Program Environmental Statement and Supplement. The analysis of fuel cycle impacts must be done for the particular circumstances applicable to the CRBR. The analyses of fuel cycle impacts in the ER and FES are inadequate since:
 - (1) The impact of reprocessing of spent fuel and plutonium separation required for the CRBR is not included or is inadequately assessed;
 - (2) The impact of transportation of plutonium required for the CRBR is not included, or is inadequately assessed;

- (3) The impact of disposal of wastes from the CRBR spent fuel is not included, or is inadequately assessed;
 - (4) The impact of an act of sabotage, terrorism or theft directed against the plutonium in the CRBR fuel cycle, including the plant, is not included or is inadequately assessed, nor is the impact of various measures intended to be used to prevent sabotage, theft or diversion.
7. Neither Applicants nor Staff have adequately analyzed the alternatives to the CRBR for the following reasons:
 - a) Neither Applicants nor Staff have adequately demonstrated that the CRBR as now planned will achieve the objectives established for it in the LMFBR Program Impact Statement and Supplement.
 - (1) It has not been established how the CRBR will achieve the objectives there listed in a timely fashion.
 - (2) In order to do this it must be shown that the specific design of the CRBR, particularly core design and engineering safety features, is sufficiently similar to a practical commercial size LMFBR that building and operating the CRBR will demonstrate anything relevant with respect to an economic, reliable and licensable LMFBR.
 - (3) The CRBR is not reasonably likely to demonstrate the reliability, maintainability, economic feasibility, technical performance, environmental acceptability or safety of a relevant commercial LMFBR central station electric plant.
 - b) No adequate analysis has been made by Applicants or Staff to determine whether the informational requirements of the LMFBR program or of a demonstration-scale facility might be substantially better satisfied by alternative design features such as are embodied in certain foreign breeder reactors.
 - c) Alternative sites with more favorable environmental and safety features were not analyzed adequately and insufficient weight was given to environmental and safety values in site selection.
 - (1) Alternatives which were inadequately analyzed include Hanford Reservation, Idaho Reservation (INEL), Nevada Test Site, the TVA Hartsville and Yellow Creek sites, co-location with an LMFBR fuel reprocessing plant (e.g., the Development Reprocessing Plant), an LMFBR fuel fabricating plant, and underground sites.
8. The unavoidable adverse environmental effects associated with the decommissioning of the CRBR have not been adequately analyzed, and the costs (both internalized economic costs and external social

costs) associated with the decommissioned CRBR are not adequately assessed in the NEPA benefit-cost balancing of the CRBR.

- a) There is no analysis of decommissioning in the Applicants' Environmental Report;
 - b) Environmental Impact Statements (EIS) related to LWRs prepared by NRC have been inadequate due in part to recently discovered omissions (see below), and the FES for the CRBR is no different;
 - c) A recent report "Decommissioning Nuclear Reactors" by S. Harwood; May, K.; Resnikoff, M.; Schlenger, B.; and Tames, P. (New York Public Interest Research Group (N.Y. PIRG), unpublished, January, 1976) indicates that (with the exception of the Elk River reactor) the isolation period following decommissioning of power reactors has been based on the time required for Co-60 to decay to safe levels. Harwood, et al. (p. 2) believe the previous analyses are in error because they have underestimated the significance of radionuclide, Ni-59. The time period for Ni-59 to decay to safe levels is estimated by Harwood, et al. (p. 2) for LWR to be at least 1.5 million years. The economic and societal implications of this 1.5 million year decay period are at present unknown.
 - d) Petitioner believes the NRC must systematically analyze all neutron activation products that may be produced in the proposed CRBR to determine the potential isolation period, following decommissioning, and then provide a comprehensive analysis of the costs (both economic and societal) of decommissioning.
9. Neither Applicants nor Staff have demonstrated that Applicants' plans for coping with emergencies are adequate to meet NRC requirements.
- a) The PSAR contains insufficient information regarding Applicants' ability to identify the seriousness and potential scope of radiological consequences of emergency situations within and outside the site boundary, including capabilities for dose projection using real-time meteorological information and for dispatch of radiological monitoring teams within the Emergency Planning Zones.
 - b) Applicants and Staff have failed to account properly for local emergency response needs and capabilities in establishing boundaries for the plume exposure pathway and ingestion pathway EPZs for the CRBR.

- c) The PSAR contains insufficient analysis of the time required to evacuate various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations, nor does it note major impediments to the evacuation or taking of protective actions.
 - d) The PSAR contains insufficient information to ensure the compatibility of proposed emergency plans for both onsite areas and the EPZs, with facility design features, site layout, and site location.
 - e) The PSAR contains insufficient information concerning the procedures by which protective actions will be carried out, including authorization, notification, and instruction procedures for evacuations.
 - f) Applicants' proposed emergency plans fail to take into account the special measures necessary to cope with a CDA, including the need for increased protective, evacuation and monitoring measures, reduced response time and special protective action levels.
 - g) Applicants and Staff have failed to provide adequate assurance that the proposed emergency plans will meet the requirements and standards of 10 CFR §50.47(b).
10. Neither Applicants nor Staff have demonstrated that the facility will be provided with systems necessary to establish and maintain safe cold shutdown and maintain containment integrity that are capable of performing their functions during and after being exposed to the environmental conditions.
- a) associated with postulated accidents, as required by General Design Criterion 4, 10 CFR Part 50, Appendix A; or
 - b) created by sodium fires or the burning (or local detonation) of hydrogen.
11. The health and safety consequences to the public and plant employees which may occur if the CRBR merely complies with current NRC standards for radiation protection of the public health and safety have not been adequately analyzed by Applicants or Staff.
- a) Neither Applicants nor Staff have shown that exposures to the public and plant employees will be as low as practicable (reasonably achievable).
 - b) Neither Applicants nor Staff have adequately assessed the genetic effects from radiation exposure including genetic effects to the general population from plant employee exposure.

- c) Neither Applicants nor Staff have adequately assessed the induction of cancer from the exposure of plant employees and the public.
- d) Guideline values for permissible organ doses used by Applicants and Staff have not been shown to have a valid basis.
 - (1) The approach utilized by Applicants and Staff in establishing 10 CFR §100.11 organ dose equivalent limits corresponding to a whole body dose of 25 rems is inappropriate because it fails to consider important organs, e.g., the liver, and because it fails to consider new knowledge, e.g., recommendations of the ICRP in Reports 26 and 30.
 - (2) Neither Applicants nor Staff have given adequate consideration to the plutonium "hot particle" hypothesis advanced by Arthur R. Tamplin and Thomas B. Cochran, or to the Karl Z. Morgan hypothesis described in "Suggested Reduction of Permissible Exposure to Plutonium and Other Transuranium Elements," *Journal of American Industrial Hygiene* (August 1975).

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Peter B. Bloch, Chairman
Dr. Oscar H. Parls
Mr. Frederick J. Shon**

In the Matter of

**Docket No. 50-155
(Spent Fuel Pool Amendment)**

**CONSUMERS POWER COMPANY
(Big Rock Point Plant)**

April 20, 1982

After the close of discovery, the Board rules that several subcontentions dealing with emergency planning have a basis and should be admitted for hearing. Previously, a broad emergency planning contention had been admitted for purposes of discovery, subject to a requirement that intervenors show further "specificity" before the hearing. The Board found that with respect to several subcontentions the intervenors had met the requirement.

RULES OF PRACTICE: SPECIFICITY

When a broad emergency planning contention is admitted for purposes of discovery, subject to a requirement that "specificity" be provided prior to a hearing, "specificity" should be interpreted in light of 10 CFR §2.714(b), as meaning that the intervenors must specify their basis for subcontentions admitted for hearing. Whether or not basis has been provided will be determined in light of the complete record, including the opportunity provided during discovery to uncover a basis and including an examination of applicant's response to each subcontention.

EMERGENCY PLANS: REACTORS GENERATING LESS THAN 250 MW THERMAL

10 CFR §50.47(c)(2) authorizes the reduction in size of emergency planning zones and ingestion pathways for nuclear power reactors generating less than 250 MW thermal. However, this authorization is on a case-by-case basis, requiring that the Commission determine whether a proposed license amendment, such as the expansion of a spent fuel pool, would affect the appropriateness of continued use of smaller-than-normal emergency zones.

EMERGENCY PLANS: IMPROBABLE EVENTS

Although the relative risk imposed by a plant may be considered in the case-by-case determination of whether smaller-than-normal emergency zones may be employed, it is generally the case that emergency planning is undertaken to guard against unlikely events. Since no one can estimate the combined likelihood of individually unlikely events, the Commission has required emergency plans as part of its defense-in-depth concept.

EMERGENCY PLANS: INCREASED RISK ASSOCIATED WITH LICENSE AMENDMENT

If a power reactor represents an increased risk to health and safety as the result of a proposed license amendment, then the adequacy of emergency plans to deal with that risk may be examined in a hearing. There is no requirement that there be some special feature of the proposed amendment which affects previously adopted emergency plans.

EMERGENCY PLANS: EARLY EVACUATION OF WOMEN AND CHILDREN

Appendix E requires that "protective measures be taken . . . within each EPZ to protect health and safety in the event of an accident." This general requirement permits a board to consider whether an applicant should be required to plan for the early evacuation of children and pregnant women during an emergency.

MEMORANDUM AND ORDER
(Motion to Strike Emergency Planning Contention)

This decision addresses a dispute among the parties concerning the proper status of the Christa-Maria, Joanne Bier, and Jim Mills (Christa-Maria) Contention 9, dealing with emergency planning (contention). This contention as admitted to discovery, subject to the requirement that the intervenor "should have to specify before the hearing the specific changes required in the emergency plan because of the increased fuel storage." LBP-80-4, 11 NRC 117 (1980) at 126.

At the outset, we confront a dispute concerning the meaning of the Board's requirement that specificity be provided before the hearing. Intervenor relies on the Board's language that "the Board accepts the contention" *Id.*, and construes this requirement to mean that its contention was admitted to the hearing but that prior to the hearing it needs to "specify" the changes in planning which the pool expansion are alleged to require, thus putting Consumers Power Company (applicant) on greater notice of what it would need to refute. Applicant opposes this interpretation of the Board's ruling by reference to 10. CFR §2.714(b), which requires that "the bases for each contention [be] set forth with reasonable specificity."

The Nuclear Regulatory Commission's staff (staff) first states that it interprets the Board's order as requiring that intervenors "provide the specificity necessary to put the parties on notice as to what they must oppose or defend against." NRC Staff Response to Licensee's Motion to Strike (Staff Response) at 4. Staff then states that:

The whole thrust of the Board's order with respect to Contention 9 was to allow discovery in the area of emergency planning in order that the contention could be made more specific. This would mean that Intervenor should refer to particular provisions of the Big Rock emergency plan, or to particular assumptions used in the formulation of the Big Rock plan and demonstrate that a change is necessary in these provisions or assumptions to account for the increased fuel to be stored on site.

Id. at 4-5.

We appreciate the difficulty the parties have had in interpreting the Board's order. Although the Board made no finding concerning the basis for Contention 9, its words indicated that it considered the contention admitted into the proceeding, and neither applicant nor staff sought to clarify the meaning of the order through a motion for reconsideration. On the other hand, the Board required that "specificity" be supplied before the hearing. One meaning of "specificity" is the meaning found in 10 CFR

§2.714(b), which requires that "the bases for each contention [be] set forth with reasonable specificity." This is the most reasonable interpretation and is the meaning the Board intended.

The intervenors have attempted to provide the specificity required by the Board. In their first filing they attempted to list "arguments for the Board required nexus" and "discussion." Testimony of Christa-Maria, Joanne Bier, Jim Mills, Shirley John, and John O'Neill, January 25, 1982 (testimony), *passim*. Our reading of these sections persuades us that intervenors understood that they were being required to do two things: (1) clarify in what way the expansion of the spent fuel pool would require modification of the emergency plans for Big Rock, and (2) provide some basis for believing that there is a nexus between the expansion of the pool and the allegedly required modifications. In addition, we believe that intervenors reflected a sound interpretation of the Board's meaning. The requirement of "specificity" should be interpreted both in light of §2.714 and in light of the procedural context. In this case, the procedural context was the completion of discovery. At that stage of the proceeding, intervenors already have had an opportunity to assemble evidence. With evidence in their possession, they should be able to specify changes in the emergency plan together with their informed basis for believing that the changes are necessary. We believe that this interpretation of the Board's requirement is the correct one, and we shall apply that interpretation in this memorandum.

I. SPECIFIED CHANGES IN THE EMERGENCY PLAN

First, we have examined Christa-Maria's filings to determine which changes in the emergency plan have been specified to be in contest. Those changes follow:

- (1) The increased inventory of the fuel pool requires that the emergency plan be based on an inhalation pathway of 10 miles rather than 5 miles and on a 50 mile rather than a 30 mile ingestion pathway. Testimony at 4-5.
- (2) The Public Information pamphlet, which does not adequately inform people about radiation hazards, especially to children and pregnant women, should be improved. Testimony at 6, citing Brian Grimes, "director of the division of Emergency Preparedness." It also fails to educate the public properly about gamma ray radiation. Intervenors Specification of Changes, March 9, 1982 (Specification) at 3. In addition, the public, local officials and school officials should be more completely educated in problems of radiation exposure. *Id.* at 5.

- (3) The Public Information pamphlet has not been properly distributed and should therefore be redistributed. Testimony at 8.
- (4) Applicant should be required to assist persons without vehicles to leave the area. Testimony at 9.
- (5) A current list of invalids should be kept so that they can be assisted in time of emergency. *Id.*
- (6) Radiation monitoring is not sufficiently accurate. Specification at 3.
- (7) Some of the people relied on in the emergency plan do not exist and there is poor coordination among those who do exist. *Id.*
- (8) The public should be notified at the beginning of radiation releases rather than waiting for the situation to become critical; and evacuation should begin at an earlier time and at lower radiation doses. *Id.* at 4; Intervenor's Specification at 4.
- (9) There should be separate plans for winter and summer. Testimony at 4.
- (10) Communications deficiencies should be cured. *Id.* at 5.
- (11) Children and pregnant women should be evacuated at much lower levels of radiation than in the current planning for the general public.

For the sake of convenience, we will refer to these items as subcontentions.

II. BASIS FOR SUBCONTENTIONS

Having decided which subcontentions were filed by Christa-Maria, we must now review each to see whether its basis has been set forth with reasonable specificity. We will discuss each subcontention in the order in which we have just listed them.

A. Subcontention (1): Size of Emergency Planning Zones

1. Christa-Maria's Allegations

Christa-Maria alleges that there are methods by which the entire contents of the enlarged fuel pool can be dispersed and that, consequently, it is not appropriate to apply planning zone areas for nuclear power facilities with less than 250 MWt capacity. Testimony at 4. They argue, first, that the number of fuel elements in the pool is being increased from 193 to 441. *Id.* at 2. Second, that this fuel is being added to a pool in which a substantial quantity of the stored fuel is plutonium enriched and therefore of increased toxicity. *Id.* at 1, 4. Third, that:

Breach of containment is a possibility that cannot be ruled out forever just because all rules, regulations and safety measures are designed to prevent this occurrence. Murphy's Law does exist, as do natural occurrences and the real possibility at Big Rock of the impact of an aircraft. None of the above can be fully regulated At least not to the 100% effect that is deemed necessary to protect the public

[Style changed for clarity.] *Id.* at 4-5. Christa-Maria also contends that the contents of the pool could be released from a hydrogen-steam explosion, such as might accompany a supercriticality incident. Specification at 2.

For its basis for this subcontention, Christa-Maria cites the following passage from page 4 of a December 6, 1972 Memo of James Shea, U.S. Atomic Energy Commission Docket No. 50-155:

The increased quantity of plutonium in the Big Rock Point core introduces the possibility that core neutronics are affected unfavorably or that the increased toxicity of plutonium results in an unacceptable increase in radiation doses to the public during normal or post accident conditions.

Cited on Specification at 2. (Although this passage deals with plutonium in the core, Christa-Maria offers it for its implications concerning plutonium in the fuel pool.)

Christa-Maria also states that the plant is not properly shielded for gamma radiation, which creates a problem with respect to the use of the standard evacuation zones. *Id.* at 2-3.

2. Arguments Opposing Basis

Applicant and Staff concur in the opinion that Christa-Maria has merely made a general attack on the overall adequacy of the emergency plan and has not shown that there is any assumption used in determining the Big Rock emergency planning zone which is rendered inaccurate because of the expansion. Applicant's Reply at 6; Staff's Response at 5. Applicant adds that the Big Rock emergency plan is based on Appendix E to 10 CFR Part 50 which applicant describes as assuming "accident conditions involving reactor core melt consequences." Applicant's Reply at 6. More particularly, applicant asserts that it informed Christa-Maria, in response to its Interrogatory 9-2, that the maximum release of radioactivity assumed for emergency planning purposes is a full core meltdown. *Id.* at 6. Applicant also stated that its response to Interrogatory 9-6 stated that "the emergency planning assumption of a complete meltdown and loss of containment integrity overwhelms any contribution made by the spent fuel." *Id.* at 7.

Applicant also argues that the fuel pool enlargement will not add any additional plutonium enriched fuel to the pool. It states that no additional MOX fuels will be discharged to the spent fuel pool after February 1982. *Id.* at 8.

To determine the credibility of applicant's assertion that the release from "a complete meltdown and loss of containment integrity overwhelms any contribution made by spent fuel", we examined applicant's answer to Christa-Maria Interrogatory 9-6. Answers of Consumer's Power Company, May 21, 1980 at 8. The authority for that statement is cited by applicant but is not discussed. We examined the two memoranda cited, RAE 83-79 and JLB 6-80. These memoranda appear to analyze the comparative radiation coming from an expanded fuel pool during a complete loss of water from the pool. RAE 83-79 at 1. They do not purport to analyze possible releases resulting from the crash of an airplane, from a super-criticality incident which might be accompanied by a zirconium cladding fire or from a cask drop incident resulting in a zirconium cladding fire. Nor do they purport to analyze possible accidents involving a combination of fuel pool and core releases. *See* Intervenor's Supplemental Response, April 13, 1982 at 3.

3. Conclusion

Our starting point for reviewing the competing factual and legal claims is 10 CFR §50.47(c)(2). Although only Christa-Maria mentioned the applicability of this regulation to the question before us, we think it important to cite the section in its entirety:

Generally, the plume exposure pathway EPZ for nuclear power plants shall consist of an area about 10 miles (16 km) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius. The exact size and configuration of the EPZs surrounding a nuclear power reactor shall be determined in relation to local emergency needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries. The size of the EPZs also may be determined on case-by-case basis . . . for reactors with an authorized power level less than 250 MW thermal. The plans for the ingestion pathway shall focus on such actions as are appropriate to protect the food ingestion pathway.

This section makes it possible to treat a plant such as Big Rock, generating less than 250 MW thermal, on a "case-by-case" basis. However, our record does not show that the staff has ever made a case-by-case determination concerning the effect of the fuel pool expansion on the size of the emergency planning zones. *See* Safety Evaluation by the Office of

Nuclear Reactor Regulation Relating to the Modification of the Spent Fuel Storage Pool, May 15, 1982 (which does not discuss emergency planning at all). (Applicant cites a finding in the Environmental Impact Assessment that offsite radiological impacts would be environmentally insignificant, but we do not interpret that finding to extend to emergency events. Motion of Consumers Power Company to Strike, February 19, 1982 (Motion to Strike) at 9.) We find that a case-by-case evaluation of this spent fuel pool expansion is particularly necessary because of the use of restricted planning zones. *Compare Commonwealth Edison Company* (Zion Station, Units 1 and 2), LBP-80-7, 11 NRC 245 (1980) at 285.

Furthermore, we find that Christa-Maria has made plausible arguments concerning both the presence of an increased inventory of radioactive products and the mechanisms for dispersal. Applicant has not answered those arguments. Consequently, we conclude that Christa-Maria's arguments need to be evaluated and considered in making the required case-by-case determination. We therefore conclude that this subcontention has a basis and must be considered at the hearing.

We understand that our ruling will not please either applicant or staff. Both are likely to feel that the methods by which the fuel pool might be dispersed are too unlikely to deserve serious treatment. However, we consider the possibility of occurrence of improbable incidents such as these to be the reason the Commission has promulgated the emergency planning requirements, and it is not our role to question the wisdom of that policy choice. The need for emergency plans arises in an Alice-in-Wonderland World, where events occur which probabilistic risk assessment tells us to be highly unlikely. But what is unlikely? A piece of boilerplate in a steam generator at the Ginna plant caused a steam generator rupture. Sulphuric acid appears to have found its way into the primary coolant system at TMI-1. A dropped light bulb caused a transient at Rancho Seco. TMI-2 occurred as a result of a sequence of improbable events. Indeed, Murphy's Law is alive and well in reactors, justifying the Commission's continuing implementation of defense-in-depth concepts. Since no one can estimate the combined occurrence of highly improbable events, the Commission may be correct in promulgating a rule requiring emergency planning for such events.

B. Subcontention (2): Radiation Hazards Information and Training

1. Christa-Maria's Allegations

This contention rests on two legs. First, the argument, which we have just accepted as litigable, that the spent fuel pool expansion causes a greater risk in times of emergency. Second, the argument that Brian

Grimes, apparently the county (*see* Testimony at 9) director of the division of Emergency Preparedness, has found that the public information pamphlet distributed by Big Rock is weak in providing useful information about radiation hazards. Testimony at 6; Specification at 3.

2. Opposing Arguments

Applicant and staff contend that Christa-Maria has failed to show a connection between alleged deficiencies in its information pamphlet or in the training of its emergency pursuant and the *expansion* of the fuel pool. Applicant's Reply at 9; Staff's Response at 5.

3. Conclusions

10 CFR Part 50, Appendix E, IV.D.2. requires yearly dissemination to the public of "general information as to the nature and effects of radiation" 10 CFR §50.47(b)(15) requires radiological emergency response training for those who may be called to assist in an emergency.

We find that Christa-Maria has argued that the expansion of the fuel pool increases the risks which might lead to activation of emergency plans. Under that circumstance, we reject the argument that it does not matter whether the plans are adequate now because there is no *special* feature of the pool enlargement that calls for an improved plan. It is enough for Christa-Maria to show that the expansion contributes to a risk and that the reactor with its expanded pool has not been adequately protected against that increased risk. That the reactor may heretofore have been inadequately protected is not a sufficient defense against the allegation that it is not now adequately protected. (This conclusion has a widespread effect on other subcontentions and shall be called the "increased risk conclusion".)

We differentiate two branches of this subcontention. The first branch, concerning dissemination of information, has a basis in the statement of Brian Grimes. However, no basis is provided for the more specific charge that gamma ray exposure will be exacerbated by the expansion of the fuel pool and that there is a need to improve education about gamma rays. Nevertheless, the general contention concerning inadequate education is supported by a basis and gamma ray education arguments are admissible if they are shown to be linked to the overall contention about inadequate education. The second branch of this subcontention, relating to inadequate training, has a basis in the affidavit of the intervenors. *See* Testimony at 9.

Consequently, we accept this entire subcontention, modified to delete any explicit mention of gamma radiation.

C. Subcontention (3): Distribution of Public Information Pamphlet

Intervenors have alleged, without any citation to the record or to other authority, that applicant's public information pamphlet has not been distributed pursuant to regulations but has been "just laid out at several key places for people to take." Testimony at 8. However, this allegation is contained in an affidavit and applicant apparently has not contradicted this assertion of fact. Since Appendix E requires distribution of the pamphlet, as we have already discussed, it should be properly distributed and this unrebutted testimony of Christa-Maria establishes a basis for this subcontention. Furthermore, our acceptance of the increased risk conclusion requires us to find that this subcontention has a nexus to the pending application for amendment and that it should be admitted.

D. Subcontention (4): Assistance for People Without Vehicles

Intervenors state that applicant has refused to assist people without vehicles to leave the area in times of emergency. Testimony at 9. We do not find applicant contradicting this assertion. Furthermore, we find that there is a question under the regulations as to whether the requirements of 10 CFR §50.47(b)(8) for "adequate emergency facilities" can be met without providing transportation of some type for those without it. Having already accepted the increased risk conclusion, we must therefore also admit this subcontention.

E. Subcontention (5): Current List of Invalids

Intervenors state that the Sheriff keeps a list of invalids who would need assistance in an emergency but that the list is inadequate because it depends on voluntary action of the invalids to be on the list. Testimony at 9. For reasons parallel to those applying to contention (4), this subcontention also must be accepted.

F. Subcontention (6): Inadequate Radiation Monitoring

Intervenors have stated in their affidavit that compliance with technical requirements, such as installation of monitoring equipment, etc., has been continually deferred by the utility or is being reduced. Testimony at 8. They expanded on this in the subsequent Christa-Maria Specification at 3, by stating that monitoring depends on extrapolation with insufficient accuracy. These factual allegations have not been contradicted. See Applicant's Reply at 8-9. Furthermore, 10 CFR §50.47(b)(9) requires adequate monitoring. Having accepted the increased risk conclusion, we must therefore admit this subcontention.

G. Subcontention (7): Personnel Specification and Coordination

Intervenors' affidavit stated that there are insufficient personnel to insure proper control in case of an accident. Testimony at 8; Specification at 3. There is no specific contradiction of this subcontention, which apparently falls within 10 CFR §50.47(b)(3), (5) and (6) and may fall within other subsections as well. Consequently, we must also accept this subcontention.

H. Subcontention (8): Earlier Public Notification

Intervenors allege that expansion of the fuel pool would release higher amounts of radiation and at a faster rate. Testimony at 5. They assert that this requires that the public be notified earlier about the need to leave. Specification at 4. However, intervenors do not even state the current criteria for notification of the public and do not indicate why those specific criteria are deficient. Hence, they have not established a sufficient basis for this subcontention and it shall not be admitted.

I. Subcontention (9): Separate Plans for Winter and Summer

Intervenors have specified that there should be separate emergency plans for winter and summer, accommodating the difficulties of winter weather and the complications caused by large numbers of summer visitors. Specification at 4. Applicant recognizes that this assertion has been made but does not provide any specific factual reason for rejecting it. Applicant's Reply at 9. Hence, based on our acceptance of the increased risk conclusion, we must admit this subcontention.

J. Subcontention (10): Communications deficiencies

Intervenors have generally "specified" communications deficiencies. Specification at 5. This will not do. It provides inadequate notice of what is contended and appears to be without basis. (We carefully reread the Testimony without finding a basis.) Consequently, this subcontention must not be admitted.

K. Subcontention (11): Children and Pregnant Women

Intervenors allege that children and pregnant women are more susceptible to radiation and that provision should be made for them to leave early during an emergency. Specification at 3. Applicant does not assert that its plan makes such provision or that such a provision would not be helpful. Applicant's Reply at 9. It does assert that the Appendix E does not require

such a provision and that the subcontention therefore is in controvention of the regulations. *Id.*

We disagree with Applicant's interpretation of Appendix E, particularly with respect to section II.C. That section requires a description of "protective measures to be taken . . . within each EPZ to protect health and safety in the event of an accident." We interpret intervenors to be alleging that a specific protective measure must be included in the plan because it is required for the reasonable protection of the public. This particular suggestion also derives practical support from the TMI-2 experience, in which women and children were evacuated. Consequently, we find that this subcontention falls within the scope of the regulations and that pursuant to our incremental risk conclusion, this subcontention must be accepted.

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is this 20th day of April, 1982.

ORDERED

Christa Maria's Contention 9, previously admitted to discovery, is limited to the following subcontentions:

- (1) The increased inventory of the fuel pool requires that the emergency plan be based on an inhalation pathway of 10 miles rather than 5 miles and on a 50 mile rather than a 30 mile ingestion pathway.
- (2) Consumer Power Company (applicant) should improve its public information pamphlet to more adequately inform people about radiation hazards, particularly to children and pregnant women. In addition, the public, local officials and school officials should be more completely educated in problems of radiation exposure.
- (3) Applicant's public information pamphlet has not been properly distributed and should therefore be redistributed.
- (4) Applicant should be required to assist persons without vehicles to leave the area during an emergency evacuation.
- (5) A current list of invalids should be kept so that they can be assisted in time of emergency.
- (6) Applicant should comply with regulations requiring adequate radiation monitoring.

- (7) Applicant's emergency plan should be revised so that it relies only on people who exist and have been properly identified and so that there will be adequate coordination among responsible personnel.
- (8) Applicant should have separate emergency plans appropriate for summer and winter.
- (9) Appropriate emergency plans should be made for children and pregnant women to evacuate at appropriate levels of radiation, considering their special susceptibility.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

**Oscar H. Paris,
ADMINISTRATIVE JUDGE**

**Frederick J. Shon
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Peter B. Bloch, Chairman
Jerry R. Kline
Hugh C. Paxton**

In the Matter of

**Docket Nos. 50-266-OLA
50-301-OLA**

**WISCONSIN ELECTRIC POWER
COMPANY**

**(Point Beach Nuclear Plant,
Units 1 and 2)**

April 22, 1982

The Board rules that applicant must disclose to the intervenor the names and addresses of temporary employees of its contractor, hired to work on steam generator tube-sleeving demonstration project and applicant also must disclose information on the performance of plugs that had been inserted into degraded tubes. However, the Board also rules that questions related to reactor pressure vessel embrittlement are not relevant to a tube-sleeving proposal and that those questions need not be answered.

**RULES OF PRACTICE: INTERROGATORIES (PRIVACY OF
EMPLOYEES)**

The names and addresses of temporary employees who have worked on a tube sleeving project are relevant to intervenor's quest for information about quality assurance in a tube-sleeving demonstration project. Since applicants have not given any specific reason to fear that intervenors will harass these individuals, their names should be disclosed so that intervenors may seek their voluntary cooperation in providing information to them.

RULES OF PRACTICE: MOTION TO COMPEL

Information about the performance of plugs inserted into steam generator tubes may be relevant to the performance of sleeves which may be inserted into similar tubes or, in some cases, into the previously plugged tubes. Consequently, interrogatories about plugs must be answered in a license amendment proceeding involving the sleeving of steam generator tubes.

RULES OF PRACTICE: RELEVANCE OF INTERROGATORIES

Interrogatories concerning possible embrittlement of a reactor pressure vessel are not relevant to whether a tube sleeving proposal is safe and such questions need not be answered in a license amendment proceeding concerning a proposal to sleeve steam generator tubes.

TECHNICAL ISSUES CONSIDERED:

Reactor pressure vessel embrittlement; steam generator tube sleeving; plugging steam generator tubes; pressure vessel embrittlement.

MEMORANDUM AND ORDER (Concerning a Motion to Compel)

This motion addresses whether Wisconsin Electric Power Company (applicant) has an obligation to respond to certain interrogatories served on it by Wisconsin's Environmental Decade (Decade) on February 10, 1982. Decade's Motion to Compel was filed on March 28, 1982 and responded to by applicant on April 12, 1982. Then, on April 16, 1982, Decade filed a brief reply. The Nuclear Regulatory Commission's staff has declined to participate in this procedural dispute.

The disputed interrogatories address the following areas of concern: (1) the interrelationship between possible deterioration (embrittlement) of the reactor's pressure vessel due to irradiation and the safety of the proposed tube sleeving project; (2) the names, addresses and positions of workers temporarily employed on the tube sleeving project; and (3) information about leaking plugs. We have considered each of these categories of information separately. For reasons stated below, we have decided to order that applicant answer questions in the second and third categories but that it need not answer questions in the first category.

I. APPLICABLE PRINCIPLES

The principles applicable to motions to compel were discussed in a scholarly opinion by a Licensing Board whose chairman was the Hon. Max Paglin. *Boston Edison Company, et al. (Pilgrim Nuclear Generating Station, Unit 2)*, LBP-75-30, 1 NRC 579 (1975). The following passage is particularly helpful:

It has been uniformly recognized that the discovery rules are to be accorded a liberal treatment so that parties may obtain the fullest possible knowledge of issues and facts before trial, and that the inquiries are limited only by the requirement that they be reasonably relevant to a sensible investigation.

However, the authorities have also held that, as a rule of necessity, there must be limitations on the concept of relevancy so as ". . . to keep the inquiry from going to absurd and oppressive grounds."

[Footnote omitted.] *Id.* at 582; *Pennsylvania Power and Light Company and Allegheny Electric Cooperative, Inc. (Susquehanna Steam Electric Station, Units 1 and 2)*, ALAB-613, 12 NRC 317 (1980) at 322.

With respect to interrogatories concerning embrittlement, we face a tough question about whether embrittlement of the reactor vessel is relevant to an application for an amendment to authorize the sleeving of steam generator tubes. On this issue, we find the appeal board decision in *Consumers Power Company (Big Rock Point Nuclear Plant)*, ALAB-636, 13 NRC 312 (1981) helpful. In that case, intervenors argued that unless the fuel pool expansion were permitted the plant would have to cease operation; they therefore sought to raise environmental questions about whether the plant should be permitted to operate. However, the appeal board rejected that argument, finding that:

The federal action sought here is approval of a license amendment to expand the capacity of the Big Rock Point spent fuel pool by the addition of extra racks for the fuel assemblies; it is *not* approval to alter any other aspect of the facility or the term of the license.

Id. at 323. Similarly, applicant requests permission to sleeve corroded steam generator tubes but not to alter any other aspect of the facility or the term of the license. Although we are now ruling on safety issues rather than environmental issues, the principles of *Big Rock* are still applicable. Our proceeding is directed at the safety of the proposed amendment and not to the general safety of the *Point Beach* unit. Although intervenors are correct in arguing that the Commission has a general responsibility for the

safety of operating nuclear plants, this Board's jurisdiction is limited to issues legitimately before it and is not plenary. *See* Decade's Motion to Compel at 9.

II. EMBRITTEMENT INTERROGATORIES

Decade is concerned that irradiation of the walls of the reactor pressure vessel have embrittled it, making it more susceptible to a rupture, possibly as the result of pressurized thermal shock. As Decade points out, a pressure vessel rupture would cause a very serious condition. In addition to creating a direct risk of an unrecoverable loss-of-coolant accident, a rupture could cause the coincident rupture of weakened steam generator tubes, leading to steam binding that would further interfere with attempts to reflood the reactor. *Id.* at 4.

At an earlier stage of this proceeding, we ruled on a similar but not identical question. At that stage, we required Decade to show cause why a sleeving demonstration program, involving permission to sleeve six steam generator tubes, should not be licensed. *Wisconsin Electric Power Company (Point Beach Nuclear Plant, Units 1 and 2)*, LBP-81-55, 14 NRC 1017 (1981). In the course of that proceeding, Decade contended that a possible embrittlement problem was grounds for not licensing the tube sleeving demonstration project. We rejected that argument, finding that Decade had failed to establish a basis for relating embrittlement to the safety of the tube sleeving demonstration project. *Id.* at 1026, citing Tr. 598.

Now we face a somewhat different question: whether discovery should be permitted either because the information sought is in controversy and would be admissible at a hearing or because "the information sought appears reasonably calculated to lead to the discovery of admissible evidence." 10 CFR §2.740(b)(1) and (2). It is this latter standard, concerning what can be "reasonably calculated" that differentiates the instant question from the question we previously decided. *Compare* Licensee's Response at 3-5. (We reject applicant's argument that we already ruled on this question at Tr. 736. Instead, we find that Tr. 736-739 makes it clear that we refrained from ruling at that time, awaiting the results of discussions among the parties.)

However, our review of Decade's filings fails to discover any showing of how the *sleeving* program would cause problems in the reactor pressure vessel or how discovery of information about embrittlement, or steps to remedy embrittlement, would lead in any way to information reflecting unfavorably on the safety of *sleeving*. Indeed, Decade seems to have things somewhat reversed. It seems to be arguing that if the sleeving program would weaken steam generator tubes then reactor vessel problems of

embrittlement and thermal shock would make this weakened condition dangerous. It also argues that a failure of steam generator tubes would cause special problems at Point Beach if the reactor core should be reconfigured in response to embrittlement problems, thereby increasing the cooling requirements in the center of the core during a loss of coolant accident.

For the purpose of analyzing the relevance of these arguments, let us assume that Decade can prove its underlying premise, that steam generator tubes would be weakened by sleeving and would be dangerous. If Decade demonstrates the truth of that premise, then it will have drawn the tube sleeving project into serious question. However, the validity of Decade's case depends on its proving the tube weakening may occur and does not depend on whether the reactor vessel is embrittled. Evidence of embrittlement would not contribute to the proof that sleeving weakened the tubes and is therefore dangerous. Further proof that the vessel is embrittled would be unnecessary icing on the cake, unessential to obtaining relief from a sleeving project that had been shown to be unsafe.

Our ruling will not, of course, resolve Decade's concerns about embrittlement. However, our jurisdiction is limited to the particular licensing amendment before us and to safety and environmental issues that have been admitted for consideration. To the extent that our authority is insufficient, Decade must look elsewhere for a remedy. It may, for example, investigate the possible applicability of a petition to the Director of the Office of Nuclear Reactor Regulation under 10 CFR §2.206. See, e.g. *Southern California Edison Company (San Onofre Nuclear Generating Station, Unit 1)*, DD-81-19, 14 NRC 1041 (1981).

III. NAMES OF TEMPORARY EMPLOYEES

Decade seeks to discover:

The names, last known addresses, and job titles of all persons who were employed by the Licensee or its contractors or sub-contractors to perform the fall 1981 demonstration sleeving program at Point Beach Nuclear Plant Unit 1.

Applicant objects to this form of discovery, stating that "the only reason it has the names of channel head workers (who were not Licensee's employees) is because of [required] personnel radiation exposure records." It relies on the government policy expressed in the Freedom of Information Act, 10 CFR §§9.5(a)(6) and 9.6, for the proposition that "personnel and medical files and similar files" need not be released. Licensee's Response at 8. It also argues, without submitting any supporting evidence, that disclosure of the requested information would expose more than 50 people and their families "to potential annoyance, embarrassment, intimidation, oppression,

and reprisals, such as harassing and threatening phone calls and vandalism." *Ibid.* It asserts that these results would flow from the specially sensitive nature of the nuclear industry.

Decade assures us, however, that it would conduct a select number of structured interviews that would be voluntary and polite and therefore nonintrusive. Decade's Motion to Compel at 10. Furthermore, Decade points out that it seeks to find out about the performance of transient workers hired to perform "the delicate installation of sleeves." *Id.* at 10. It considers this information sufficiently important that it is willing to agree to rely on an independent investigator appointed by the Commission to assemble the facts. *Id.* at 11.

We think the merits of this issue are clear. Decade has not shown that there were any quality assurance problems in the tube sleeving demonstration program. However, its interrogatories are directly related to its contention that transient workers are unreliable for those tasks. Hence, it is entitled to inquire further.

Since the requested records are not agency records and applicant is not an agency, the Freedom of Information Act is merely suggestive. All Decade is asking is the right to obtain the names of these workers for the purpose of asking their voluntary cooperation in obtaining relevant information. We have no reason to assume that these workers would object to being asked or that they would refuse voluntary cooperation in supplying information of potential importance to the health and safety of the public. Nor do we have any reason to believe that either Decade or the public would harass these individuals or that their identities would be released to the public.

Decade's motion to compel an answer to its interrogatory 11 shall be granted.

IV. LEAKING PLUGS

Decade made the following discovery request:

Please list all leaking plugs observed at Point Beach Nuclear Plant by unit, steam generator, row, column, and date observed.

State any and all studies, analyses or consideration of any kind given to leaking plugs.

Decade's First Interrogatories at 7-8. Applicant has not answered these interrogatories because it asserts that leaking plugs are "in no way related to the sleeving of steam generator tubes, and is thus totally outside the scope of this proceeding." Licensee's Response at 12.

Decade believes its interrogatories are relevant because of a Staff conclusion allegedly reached in a Safety Evaluation Report on Point Beach Unit 1. That report, said to have been dated November 30, 1979, allegedly

found that "the extent of the in-leakage *through tube ruptures* at Point Beach Nuclear Plant would be less than that needed to prevent reflood." Decade's Motion to Compel at 12.

Although we find Decade's explanation to be without merit because it is unrelated to the safety of tube sleeving (in a similar fashion to the lack of relevance of the embrittlement questions), we find that its interrogatories merit a response. Plugs are inserted into Point Beach tubes through mechanical and other means. The performance of those plugs may have direct relevance to the performance of sleeves inserted into identical tubes through arguably analogous processes. This data is relevant to the admitted contention, that:

Wisconsin Electric Power Company has not demonstrated that its sleeving program for the Point Beach Nuclear Plant, Units 1 and 2, can be conducted without endangering the health and safety of the public and will be conducted in compliance with the Commission's regulations.

Point Beach, LBP-81-45, 14 NRC 853 (1981) at 860. (For motions Decade may subsequently make, the contention has been restricted. *Point Beach*, LBP-82-19A, 15 NRC 623 (1982).) Furthermore, since some previously plugged tubes will be sleeved, the history of those previously plugged tubes could have a bearing on the sleeving process. We note as well that data on plugged tubes could be relevant to Decade's original contentions on a possibly corrosive environment in the annulus formed in the tube by sleeving.

Consequently, we will require applicant to respond to interrogatories 15 and 16.

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter it is this 22nd day of April, 1982.

ORDERED

Wisconsin Electric Power Company's (applicant) objections to the Wisconsin Environmental Decade's (Decade) February 10, 1982 Interrogatories #11, 15 and 16 are found to be without merit but its objections to Interrogatories #1, 2, 3 and 4 are sustained. Hence, applicant shall respond

promptly to Interrogatories #11, 15 and 16; but they are excused from responding to Interrogatories #1, 2, 3 and 4.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Louis J. Carter, Chairman
Dr. Oscar H. Paris
Frederick J. Shon**

In the Matter of

**Docket Nos. 50-247-SP
50-286-SP**

**CONSOLIDATED EDISON
COMPANY OF NEW YORK
(Indian Point, Unit No. 2)**

**POWER AUTHORITY OF THE
STATE OF NEW YORK
(Indian Point, Unit No. 3)**

April 23, 1982

The Licensing Board sets forth the final formulation of all contentions to be litigated in this investigative proceeding along with the final intervenor assignments with respect to those contentions, and a schedule for discovery and hearing.

**MEMORANDUM AND ORDER
(Formulating Contentions, Assigning
Intervenors, and Setting Schedule)**

**CONTENTIONS AND
INTERVENOR ASSIGNMENTS**

At the Second Special Prehearing Conference held in White Plains, New York, on April 13 and 14, 1982, we heard argument from the Licensees, the NRC Staff, and the Intervenors with regard to the contentions formulated and intervenor responsibilities assigned by the Board in its

Memorandum and Order issued April 9, 1982. Upon consideration of the various and often conflicting points raised by the parties with respect to the contentions, we have determined that some contentions should be modified by the Board and others left standing as originally formulated. We have also considered proposals and argument for changes in the assignment of intervenor responsibilities and have determined what changes in assignment should be made.

The bases for the contentions formulated by the Board and set forth below rest in the bases and subparts of the subsumed intervenor contentions. We have deliberately avoided specifying detailed factual bases in our formulation of contentions because this is an investigative proceeding. Our responsibility, as we see it, is to bring to light *all* factual information which may assist materially in answering the Commission's questions. We are mindful of the Commission's instructions to conduct a focused proceeding, but we believe that we should not limit this investigation by imposing inflexible legal standards. To assure that the necessary focus is maintained, we intend to closely monitor discovery, testimony, and cross examination, to determine its relevance and materiality. Irrelevant or frivolous questions and tactics will not be tolerated in this proceeding.

In order to provide the parties and participants to this proceeding with a single document that conveniently lists the Commission's Questions (from the Commission's January 8, CLI-81-1, 13 NRC 1, and September 18, 1981, CLI-81-23, 14 NRC 610, Orders), the final formulation of all contentions to be litigated in this investigative proceeding, and the final intervenor assignments with respect to those contentions, we are repeating herein unmodified contentions as well as those contentions which we have modified. Unchanged intervenor assignments and the Commission's Questions are repeated, also. The discussion is organized on the basis of the six Commission Questions, and parties are identified in the Appendix.

Commission Question 1:

1. What risk may be posed by serious accidents at Indian Point 2 and 3, including accidents not considered in the plants' design basis, pending and after any improvements described in (2) and (4) below? Although not requiring the preparation of an Environmental Impact Statement, the Commission intends that the review with respect to this question be conducted consistent with the guidance provided the staff in the Statement of Interim Policy on "Nuclear Power Plant Accident Considerations under the Na-

tional Environmental Policy Act of 1969;" 44 FR 40101 (June 13, 1980).⁵

⁵In particular, that policy statement indicates that:

Attention shall be given both to the probability of occurrences of releases and to the environmental consequences of such releases;

The reviews "shall include a reasoned consideration of the environmental risks (impacts) attributable to accidents at the particular facility or facilities . . .";

"Approximately equal attention should be given to the probability of occurrence of releases and to the probability of occurrence of the environmental consequences . . ."; and

Such studies "will take into account significant site and plant-specific features . . ."

Thus, a description of a release scenario must include a discussion of the probability of such a release for the specific Indian Point plants.

Contention 1.1

We have determined that Contention 1.1 should be modified, but there need be no change in intervenor assignment. As accepted for litigation, Contention 1.1 states as follows:

- 1.1 The accident consequences that would be suffered by the public, even allowing for emergency planning measures, and their associated probabilities combine to produce high safety risks or risks of environmental damage including: prompt fatalities, early fatalities, early and latent illnesses, fatal and non-fatal cancers, thyroid nodules, genetic effects, and contamination of buildings, soils, waters, agricultural lands, recreational lands, and wildlife areas.

This contention is based on the following intervenor contentions:

UCS/NYPIRG I(B)(5), III(B), III(D), IV(A)

FOE/Audubon I, II

Parents I

Lead Intervenor: UCS/NYPIRG

Contributing Intervenors: FOE/Audubon with respect to effects on buildings, soils, waters, agricultural lands, recreational lands, and wildlife areas.

Parents with respect to the special susceptibility of children to radiation.

Commission Question 2:

2. What improvements in the level of safety will result from measures required or referenced in the Director's Order to the licensee,

dated February 11, 1980? (A contention by a party that one or more specific safety measures, in addition to those identified or referenced by the Director, should be required as a condition of operation would be within the scope of this inquiry if, according to the Licensing Board, admission of the contentions seems likely to be important to resolving whether (a) there exists a significant risk to public health and safety, notwithstanding the Director's measures, and (b) the additional proposed measures would result in a significant reduction in that risk.)

Contention 2.1

We have determined that Contention 2.1 need not be modified, nor is a change in intervenor assignment required. As accepted for litigation, Contention 2.1 reads as follows:

2.1 The following additional specific safety measures should be required as conditions of operation:

- a) A filtered vented containment system for each unit must be installed.
- b) License conditions must be imposed to prohibit power operations with less than a fully operable complement of safety-grade and/or safety-related equipment.
- c) A "core-catcher" must be installed at each unit to provide additional protective action time in the event of a "melt-through" accident in which the reactor pressure vessel is breached by molten fuel.
- d) A separate containment structure must be provided into which excess pressure from accidents and transients can be relieved without necessitating releases to the environment, thereby reducing the risk of containment failure by overpressurization.

This contention is based on the following intervenor contentions:

UCS/NYPIRG III(A)d., f., g., h.

Lead Intervenor: UCS/NYPIRG

Contributing Intervenor: None

Contention 2.2

WBCA, the intervenor from whose contentions the Board formulated Contention 2.2, argued that an important element had been omitted by the

Board's formulation of the contention. WBCA directed attention to language in its filing of January 11, 1982, relating to inadequate quality control and operational errors. Tr. 625-27. Upon consideration of this pleading, and all objections thereto, we have determined that Contention 2.2 should be modified by the addition of subcontention (d). As accepted for litigation, Contention 2.2 reads as follows:

2.2 The following additional specific safety measures should be required as conditions of operation:

- a) The cooling system at the plants should be changed so that it no longer uses brackish Hudson River water. This change is needed to combat safety-related corrosion problems.
- b) A solution to the radiation embrittlement problem in the units' reactor pressure vessels must be found and implemented.
- c) A solution to the problem of steam generator tube deterioration must be found and implemented.
- d) A complete review of both plants must be undertaken to discover and correct flaws resulting from poor quality control in construction and in operation.

This contention is based on the following intervenor contentions:

WBCA 2 (filing of January 11, 1982)

Lead Intervenor: WBCA

Contributing Intervenor: None.

Commission Question 3:

3. What is the current status and degree of conformance with NRC/FEMA guidelines of state and local emergency planning within a 10-mile radius of the site and, of the extent that it is relevant to risks posed by the two plants, beyond a 10-mile radius? In this context, an effort should be made to establish what the minimum number of hours warning for an effective evacuation of a 10-mile quadrant at Indian Point would be. The FEMA position should be taken as a rebuttable presumption for this estimate.

Contention 3.1

We have determined that Contention 3.1 needs only minor editorial corrections. RSCE pointed out that they should be listed as contributing intervenors. Tr. 673-4. The Board agreed. As accepted for litigation, Contention 3.1 reads as follows:

3.1 Emergency planning for Indian Point Units 2 and 3 is inadequate in that the present plans do not meet any of the sixteen mandatory standards set forth in 10 CFR 50.47(b), nor do they meet the standards set forth in Appendix E to 10 CFR Part 50.

This contention is based on the following intervenor contentions:

USC/NYPIRG I(A)

WESPAC 1, 2, 3

RCSE (2), (3), (5)

Lead Intervenor: **USC/NYPIRG**

Contributing Intervenors: **WESPAC** with respect to New York State Radiological Emergency Plan and deficiencies therein relating to notification, communications, training, drills, equipment, and procedures. **RSCE** with respect to whether plans comply with 10 CFR 50.47(b)(6) and (7) and NUREG-0654.

Contention 3.2

We have determined that Contention 3.2 needs additional specificity. With regard to intervenor contributions to the litigation of the contention, Parents requested that their contribution be expanded to include those entrusted with the care of children. Tr. 668-674. WBCA argued that it had raised the issue of whether it was reasonable to assume that the plant operators would remain at their posts during an emergency. Tr. 680-682. We have decided that these requested changes should be made in the intervenor assignments. Contention 3.2 as accepted for litigation, and the revised intervenor assignments, are as follows:

3.2 Emergency planning for Indian Point Units 2 and 3 is inadequate in that the plans make erroneous assumptions about the response¹ of the public and of utility employees during radiological emergencies.

This contention is based on the following intervenor contentions:

UCS/NYPIRG I(B)(1)

WESPAC 4

Parents III

WBCA, filing dated January 11, 1982

¹ Human response here refers to responsive *actions* by persons, as opposed to psychological stress response, which we deal with later.

Lead Intervenor: UCS/NYPIRG

Contributing Intervenors: WESPAC with respect to problems of local traffic flows.

Parents with respect to the special problems of the response of children and those entrusted with their care during emergencies.

WBCA with respect to the behavior of the utility companies' employees during emergencies.

Contention 3.3

We have determined that Contention 3.3 needs only minor editorial change, and no change need be made in assignment of intervenors. As accepted for litigation, Contention 3.3 reads as follows:

3.3 The present estimates of evacuation times, based on NUREG-0654 and studies by CONSAD Research Corporation and by Parsons, Brinckerhoff, Quade & Douglas, Inc., are unreliable. They are based on unproven assumptions, utilize unverified methodologies, and do not reflect to the actual emergency plans.

This contention is based on the following intervenor contention:

UCS/NYPIRG I(B)(2)

WBCA 3

RCSE (1)

Lead Intervenor: UCS/NYPIRG

Contributing Intervenor: WBCA with respect to applicability of FEMA estimates from NUREG-0654.

RCSE with respect to the Rockland County Radiological Emergency Response Plan.

Contention 3.4

WESPAC argued that its contention number 2 said essentially the same thing as the Board's contention 3.4 and requested designation under this contention as a contributing intervenor. That request was granted at the Second Special Prehearing Conference. Tr. 678. The contention itself needs only editorial modification. As accepted for litigation, Contention 3.4 reads as follows:

3.4 The Licensees cannot be depended upon to notify the proper authorities of an emergency promptly and accurately enough to assure effective response.

This contention is based on the following intervenor contention:

RCSE (1)

WESPAC 2

Lead Intervenor: RCSE

Contributing Intervenor: WESPAC

Contention 3.5

The Board has determined that this contention is related more directly to Commission Question 4 than to Question 3. It is therefore listed herein as Contention 4.6. There will be no Contention 3.5.

Contention 3.6

WESPAC argued that its contention 3, basis D, should be subsumed under Board Contention 3.6 and requested contributing intervenor status. The Board agreed. Tr. 678. Contention 3.6 as admitted for litigation and the extent of WESPAC's contribution are as follows:

3.6 The emergency plans and proposed protective action do not adequately take into account the full range of accident scenarios and meteorological conditions for Indian Point Units 2 and 3.

This contention is based on the following intervenor contentions:

UCS/NYPIRG I(B)(3)

WESPAC 3, basis D

Lead Intervenor: UCS/NYPIRG

Contributing Intervenor: WESPAC with respect to the impracticality of conducting effective drills covering all likely conditions.

Contention 3.7

We have determined that this contention need not be modified. *Parents*, however, requested that basis (15) of their contention I be added to the

others listed in our Order of April 9, 1982. The Board agreed. As accepted for litigation Contention 3.7 reads as follows:

3.7 The problems of evacuating children from threatened areas have not been adequately addressed in the present emergency plans.

This contention is based on the following intervenor contention:

Parents I, bases (4), (5), (6), (7), (15)

Lead Intervenor: Parents

Contributing Intervenor: None

Contention 3.8

The Board has determined that Contention 3.8 would more appropriately be considered with respect to Commission Question 4. It is therefore listed herein, as modified, under the number 4.7. There will be no Contention 3.8.

Contention 3.9

The Board has determined that Contention 3.9 need not be modified. As accepted for litigation, Contention 3.9 reads as follows:

3.9 The road system in the vicinity of the Indian Point plant is inadequate for timely evacuation.

This contention is based on the following intervenor contentions:

WESPAC 5

WBCA 1, 5

Co-lead Intervenor: WESPAC with respect to Westchester County

WBCA with respect to Rockland County

Contributing Intervenor: None

Commission Question 4:

4. What improvements in the level of emergency planning can be expected in the near future, and on what time schedule, and are there other specific offsite emergency procedures that are feasible and should be taken to protect the public?

Contention 4.1

Upon consideration of the argument heard at the Second Special Prehearing Conference, the Board has determined that Contention 4.1 should be modified. Tr. 743 ff. In addition, Parents requested a minor change with respect to the responsibility assigned to it. Contention 4.1 as accepted for litigation reads as follows:

- 4.1 The plume exposure pathway EPZ should be expanded from its present 10-mile radius in order to meet local emergency response needs and capabilities.²

This contention is based on the following intervenor contentions:

UCS/NYPIRG II(A), II(B), III(C)

Parents II, basis (7)

Lead Intervenor: UCS/NYPIRG

Contributing Intervenor: Parents with respect to children, those responsible for the care of children, and child care institutions and their locations.

Contention 4.2

We have determined that no modification of Contention 4.2 is necessary, nor is any change in intervenor assignments needed. As accepted for litigation, Contention 4.2 reads as follows:

- 4.2 The following specific, feasible off-site procedures should be taken to protect the public:
- a) Potassium iodide should be provided in an appropriate form for all residents in the EPZ.
 - b) Adequate sheltering capability should be provided for all residents in the EPZ.

² The Board has considered the argument by Licensees that this contention is a challenge to NRC regulations and therefore should be disallowed. See Tr. 769 ff. We reiterate our belief, stated in fn 4 of our April 9, 1982 Order, that this contention does not, in fact, challenge 10 CFR §50.47 and Appendix E, but is in accordance with it. Further, we reconfirm our conviction that we are authorized by fn. 4, as revised, in the Commission's Orders of January 8 and September 18, 1981 to accept contentions addressed to the Commission's Questions, if those contentions seem likely to be important in resolving the Commission's Questions, even though the contentions may urge requirements for Indian Point beyond the Regulations. Con Edison's citation of the transcript of the Commission's September 11, 1981 meeting illustrates the reason for the provision under 10 CFR §9.103 that statements of Commissioners in open meetings may not be pleaded or cited in any proceeding under Part 2 except as the Commission may direct.

- c) License conditions should prohibit power operation of Units 2 and 3 when the roadway network becomes degraded because of adverse weather conditions.
- d) The roadway network should be upgraded to permit successful evacuation of all residents in the EPZ before the plume arrival time.

This contention is based on the following intervenor contentions:

UCS/NYPIRG III(A)

RSCE (4)

Lead Intervenor: UCS/NYPIRG

Contributing Intervenor: RCSE with respect to the adequacy of sheltering as a protective action.

Contention 4.3

FOE/Audubon pointed out that the basis accepted by the Board in its Contention I needed to be expanded to be understandable, and the Board agrees. Tr. 707-8. In addition, WESPAC requested that it be added as a contributing intervenor with respect to upgrading roads in Westchester County. Tr. 791. As accepted for litigation, Contention 4.3 reads as follows:

- 4.3 There are no feasible offsite emergency procedures which can adequately protect the public.

This contention is based on the following intervenor contentions:

FOE/Audubon I

WBCA question number 4 in the filing of January 11, 1982

WESPAC 5

Lead Intervenor: FOE/Audubon

Contributing Intervenor: WBCA with respect to the impossibility of upgrading the road network in Rockland County.
WESPAC with respect to the impossibility of upgrading the road network in Westchester County.

Contention 4.4

We have determined that Contention 4.4 need not be modified, but some changes in intervenor assignment should be made. WBCA indicated

its interest in co-lead status with WESPAC, with the two intervenors taking responsibility for Rockland and Westchester Counties, respectively. Tr. 809 ff. UCS/NYPIRG pointed out its interest in contributing to this Board contention, as reflected in certain UCS/NYPIRG contentions. Tr. 746-7. As accepted for litigation, Contention 4.4 reads as follows:

4.4 The emergency plans should be upgraded by taking account of special groups with special needs in emergencies. In particular, provision must be made for evacuating persons who are dependent upon others for their mobility.

This contention is based on the following intervenor contentions:

WESPAC 6

Parents I, basis (22); II, basis (7)

UCS/NYPIRG IB(2), IA basis (7)

Co-lead Intervenors: WESPAC with respect to Westchester County.
WBCA with respect to Rockland County.

Contributing Intervenors: Parents with respect to special problems associated with children and those responsible for the safety of children.

UCS/NYPIRG with respect to non-English speaking residents, the hearing-impaired, persons with learning disabilities, and "latch-key" children.

Contention 4.5

We have decided to substitute the word "risk" for the word "consequences" in Contention 4.5, to make it more responsive to the wishes of the Commission as expressed in its Order of January 8, 1981 (CLI-81-1, 13 NRC 1). No change in intervenor assignment is required. The contention, as accepted for litigation, reads as follows:

4.5 Specific steps must be taken by NRC, State, and local officials to promote a public awareness that nuclear power plant accidents with substantial offsite risks are possible at Indian Point.

This contention is based on the following intervenor contention:

UCS/NYPIRG I(B)(7)

Lead Intervenors: UCS/NYPIRG

Contributing Intervenors: None

Contention 4.6 (formerly Contention 3.5)

We have determined that no modification of this contention is required, but Parents will be added as a contributing intervenor with respect to exposure level for children. Tr. 699. As accepted for litigation Contention 4.6 reads as follows:

4.6 A maximum acceptable level of radiation exposure for the public must be established before any objective basis will exist for adequate emergency planning.

This contention is based on the following intervenor contention:

UCS/NYPIRG I(B)(6)

Lead Intervenor: UCS/NYPIRG

Contributing Intervenors: Parents with respect to a maximum acceptable radiation exposure level for children.

Contention 4.7 (formerly Contention 3.8)

Several intervenors argued that the Board had formulated this contention too narrowly, and we agree. The contention has been modified accordingly, and new intervenor assignments have been made as appropriate. See Tr. 673 ff, 802 ff. As accepted for litigation Contention 4.7 reads as follows:

4.7 The present emergency planning brochures and present means of alerting and informing the population of an emergency do not give adequate attention to problems associated with persons who are deaf, blind, too young to understand the instructions, or who do not speak English.

Lead Intervenors: Parents

Contributing Intervenors: WESPAC with respect to present means of alerting and informing the population of an emergency.

WBCA with respect to surveying to determine whether the brochure has been read and understood.

RCSE in general.

Commission Question 5:

5. Based on the foregoing, how do the risks posed by Indian Point Units 2 and 3 compare with the range of risks posed by other

nuclear power plants licensed to operate by the Commission? (The Board should limit its inquiry to generic examination of the range of risks and not go into any site-specific examination other than for Indian Point itself, except to the extent raised by the Task Force.)

Contention 5.1

We have determined that no change is required in either the wording or there intervenor assignment of Contention 5.1. As accepted for litigation the contention reads as follows:

- 5.1 The risks associated with Indian Point Units 2 and 3 are greater than those associated with many other operating nuclear power plants. These greater risks result from the design and operating conditions of the plants.

This contention is based on the following intervenor allegation:

WBCA letter of December 2, 1981

Lead Intervenor: **WBCA**

Contributing Intervenors: None

Board Question on Commission Question 5

The Board Question on Commission Question 5 has been re-worded to make the question understandable standing alone. The Board Question now reads as follows:

What bearing does the fact that Indian Point has the highest population within 10, 30, and 50 miles of any nuclear plant site in the United States have on the relative risk of Indian Point compared to other plants?

The staff shall address this question. Other parties are invited to address it also.

Commission Question 6:

6. What would be the energy, environmental, economic or other consequences of a shutdown of Indian Point Unit 2 and/or Unit 3?

Contention 6.1

- 6.1 An economic consequence of the shutdown of Indian Point Units 2 and 3 would be a economic benefit accruing to Rockland County through the sale of replacement power.

This contention is based on the following intervenor contention:

WBCA question 6, filing of January 12, 1982

Lead Intervenor: **WBCA**

Contributing Intervenors: None

Contention 6.2

We have determined that no change need be made in the wording of Contention 6.2, given the understanding provided in the footnote. Nor need there be any change in intervenor assignment. As accepted for litigation the contention reads as follows:

- 6.2 The physical and psychological³ environment of children will be improved by permanently shutting down the Indian Point Nuclear Power Station.

This contention is based on the following intervenor contention:

Parents IV

Lead Intervenor: **Parents**

Contributing Intervenors: None

Contention 6.3

We have determined that this contention was made sufficiently specific in the pleading of GNYCE dated April 9 and served on the Board April 12, 1982,⁴ and during the Second Special Prehearing Conference.

³ The litigation of psychological aspects of this contention will be held in abeyance pending issuance of an opinion by the court in *PANE v NRC*, Docket No. 81-1131, D.C. Court of Appeals, and any NRC policies or regulations issued as a result of that decision. The reference to physical environment here relates to radiation released offsite by Indian Point Units 2 and 3, radiation spills during transportation of radioactive waste from the plants, and radioactive effluents released into the Hudson River. Tr. 912-13.

⁴ GNYCE responded adequately to our instructions in the Memorandum and Order dated April 9, 1982, and is hereby admitted to intervenor status.

We formulate Contention 6.3 as follows:

- 6.3 Considering the savings in operating expense which would result from shutting down Indian Point Units 2 and 3, and allowing for the ways in which cogeneration and conservation can mitigate the costs of replacement power, the net costs of shutdown are small; in fact, they are smaller than previous studies by UCS, GAO, or Rand suggest, and are entirely acceptable.

Lead Intervenor: **GNyce**

Contributing Intervenor: **UCS/NYPIRG**

TREATMENT OF MATTERS NOT IN CONTENTIONS

The Board expects the Licensees and the NRC Staff to submit evidence in response to the Commission's six Questions sufficient, in these parties' opinions, to insure that the Board has before it the full and complete information necessary to give accurate answers and recommendations to the Commissioners. Licensees and Staff must not limit their evidence so as to merely respond to contentions.

Other parties shall submit such evidence as they deem relevant to support their contentions and may submit such other evidence as they deem necessary to answer the Commission's Questions.

DISCOVERY AND HEARING SCHEDULE

We have reviewed the discovery and hearing schedules suggested by the parties at the Second Special Prehearing Conference and considered the arguments related thereto. We have determined that the hearing schedule proposed by the NRC Staff and supported by several intervenors should be accepted, for the reasons advanced by those parties. We agree that the absence of a FEMA witness between July 8 and August 9, 1982, makes it essential for us to hear testimony on Questions 3 and 4 in June. We also agree with the intervenors that the recent issuance of the Licensees' 12-volume "Indian Point Probabilistic Safety Study" makes it desirable that testimony on risk analysis be delayed to give the parties, the Staff, and the Board more time to study the report.

We are setting forth the initial discovery schedule in order to get formal discovery underway at once. Additional discovery scheduling will be ordered by the Board as the proceeding progresses. We again advise all parties that we expect discovery to proceed smoothly and expeditiously with an absolute minimum of legal maneuvering. Interrogatories shall be

direct and to the point, aimed at obtaining useful information with minimal effort, and in no way designed to harass. Interrogatories shall be answered promptly and fully, answers being complete yet succinct. Motions for protective orders must be held to a minimum, if made at all.

The initial discovery schedule and the hearing schedule for this proceeding shall be as follows:

April 15	Informal discovery began.
April 26	Formal discovery begins.
May 3	All interrogatories on matters under Commission Questions 3 and 4 filed. ⁵
May 31	Discovery closes on matters under Questions 3 and 4.
June 7	Testimony on matters under Questions 3 and 4 filed.
June 14	Cross-examination plans for Questions 3 and 4 filed.
June 17-18	Prehearing Conference pursuant to 10 CFR §2.752.
June 22-25	Evidentiary hearing.
July 2	Testimony on Commission Question 6 filed.
July 6-9	Evidentiary hearing.
July 12	Cross-examination plans on Question 6 filed.
July 16	Testimony on Commission Questions 1, 2, and 5 filed.
July 19-23	Evidentiary hearing.
July 26	Cross-examination plans on Questions 1, 2, and 5 filed.
July 26-August 6	Evidentiary hearing.

Upon consideration of the foregoing and the entire record in this matter, it is this 23rd day of April, 1982

ORDERED

1. That the contentions set forth herein shall be litigated in this proceeding.

2. The lead and contributing intervenors assigned to each contention shall be responsible for preparing and presenting the intervenors' case on that contention. Generally the lead intervenor shall present evidence and conduct cross-examination, but the lead intervenor may, at its option,

⁵ Discovery on matters to be heard later than the week of June 22 shall continue. At the Prehearing Conference scheduled for June 17 and 18 we shall ask the parties to suggest exact dates for discovery milestones on matters related to other Commission Questions.

designate a contributing intervenor to act in its stead with respect to the sub-issue assigned to the contributing intervenor.

3. The intervenors may use two cross-examiners per witness or group of witnesses, but cross-examination must not be duplicative.

4. The NRC Staff may use two cross-examiners per witness or group of witnesses but must not be duplicative in cross-examination.

5. The Licensees and Staff shall provide the Board with all information that may be required to accurately answer the Commission's six Questions, irrespective of whether all such information is needed to respond to contentions.

6. This is an interlocutory order, subject to infrequently granted discretionary interlocutory review pursuant to 10 CFR §2.718(i), and is not appealable except to the extent specified in paragraph 7.

7. To the extent that this Order grants the petition for leave to intervene of GNYCE, it is appealable to the Commission within ten (10) days after service of this order, pursuant to 10 CFR §2.714a(c).

**THE ATOMIC SAFETY AND
LICENSING BOARD**

**Louis J. Carter, Chairman
ADMINISTRATIVE JUDGE**

**Oscar H. Paris
ADMINISTRATIVE JUDGE**

**Frederick J. Shon
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

APPENDIX

PARTIES AND PARTICIPANTS TO THE INDIAN POINT UNITS 2 AND 3 SPECIAL INVESTIGATIVE PROCEEDING:

Abbreviation or Acronym	Name of Party or Participant
Con Edison Power Authority Staff	Consolidated Edison Company of New York Power Authority of the State of New York NRC Staff
Brodsky	Honorable Richard L. Brodsky
FOE	Friends of the Earth
GNYSCE	Greater New York Council on Energy
Audubon	New York City Audubon Society
Parents	Parents Concerned About Indian Point
RCSE	Rockland Citizens for Safe Energy
UCS/NYPIRG	Union of Concerned Scientists and New York Public Interest Research Group
WBCA	West Branch Conservation Association
WESPAC	Westchester Peoples Action Coalition
Attorney General Energy Office County	Attorney General of the State of New York New York Energy Office County of Westchester
MTA	Metropolitan Transportation Authority
NYC Council	Council of the City of New York
Port Authority	Port Authority of New York and New Jersey
Rockland	County of Rockland
State Assembly	New York State Assembly and Its Special Committee on Nuclear Power Safety
Village	Village of Buchanan

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Ivan W. Smith, Chairman
Dr. Walter H. Jordan
Dr. Linda W. Little**

In the Matter of

**Docket No. 50-289
(Restart)**

**METROPOLITAN EDISON
COMPANY
(Three Mile Island Nuclear
Station, Unit No. 1)**

April 26, 1982

Licensing Board denies intervenors' motions to reopen evidentiary record after conducting preliminary hearing to determine whether previously issued initial decision would be materially affected by the proffered evidence.

RULES OF PRACTICE: MOTION TO REOPEN RECORD

A motion to reopen the evidentiary record because of previously undiscovered conclusions of an NRC Staff inspection group must establish the existence of differing technical bases for the conclusions. The conclusions alone would be an insufficient evidentiary proffer to justify reopening of the record.

**MEMORANDUM AND ORDER
DENYING MOTIONS TO REOPEN RECORD**

Intervenors Steven Sholly and Union of Concerned Scientists (UCS) have filed motions to reopen the record for consideration of various issues discussed in the so-called "Martin Report".¹ This report, which came to

¹ Recommendations of TMI-2 IE Investigation Team (Operational Aspects), September 1979.

light only after the evidentiary hearing, contains recommendations consistent with some of the intervenors' contentions. The Board was not able to rule on the motions without additional information. Our efforts to obtain such information at minimum expense and delay are reflected in our memoranda of October 13, 1981, February 11, 1982 and March 2, 1982. There is no need to repeat what is recorded in those memoranda. Here it suffices to say that ultimately the Board found it necessary to hold a preliminary hearing to develop a record adequate for ruling on the motions. After the preliminary hearing, at our request, the intervenors restated their motions. Intervenor Sholly's restated motion abandons all but one of his issues in this area. Also, the Licensee and Staff filed answers to the restated motions. Now, having held that hearing, having heard the testimony of most of the Martin Report team, and having carefully reviewed the restated motions and answers thereto, we deny the motions to reopen the record.

Reopening the record is, of course, an extraordinary action. To prevail, UCS and Sholly have the burden of demonstrating that their motions are timely, that the issues they seek to litigate are significant, and that the information they seek to add to the record would change the results reached in the Board's Partial Initial Decision. *Kansas Gas and Electric Company* (Wolf Creek Generating Station, Unit No. 1), ALAB-462, 7 NRC 320, 338 (1978). Since the Board already has found the motions to be timely,² we are concerned only with the safety significance and materiality of the Martin Report information relied on by intervenors.

In order to deal with issues of significance and materiality, the Board from the beginning has sought a specification of the technical bases of the pertinent Martin team recommendations. Early in the development of this matter the intervenors also appeared to attach some importance to the technical bases of the Martin team recommendations.³ More recently, however, the intervenors have emphasized the idea that the Martin team recommendations should be given more weight than earlier Staff testimony simply because the Martin team members had a different, and presumably better, perspective due to their allegedly greater familiarity with the TMI-2 accident and reactor operations generally. The issue, as now framed by the intervenors, seems to be one of comparing the credibility of the Martin Report authors with the credibility of the Staff's witnesses in the

² Memorandum of February 9, 1982 Telephone Conference Regarding Intervenors' Motions to Reopen Evidentiary Record, February 11, 1982, at 2.

³ See, e.g., "What is important to the restart proceeding is the technical reasoning behind the recommendations because they are at variance with the otherwise monolithic Staff Line." Union of Concerned Scientists Reply to Staff and Licensee Opposition to UCS Motion to Reopen the Record, October 30, 1981, at 13.

hearing. Because we had sensed that they were going in this direction, we cautioned the intervenors even before the preliminary hearing that it would be "virtually impossible" to justify reopening the record on the basis of bare conclusions at variance with conclusions reached by earlier staff witnesses.⁴

Now that the intervenors have had an ample opportunity to explore the technical bases of the Martin team recommendations, we find little, if any, new and material facts or analyses to justify a reopening of the record. UCS itself admits as much, albeit guardedly, by saying in its final brief that it "never claimed nor believed that the authors of the Martin Report had knowledge of some hitherto secret fact not available to other diligent staff members." Comments, March 26, 1982, at 3. And in this connection we must note, in addition, that the intervenors have essentially ignored our requests for a specification of any allegedly new technical bases discovered through the preliminary hearing. Tr. 27,187, 27,190.

In principle we have never disagreed with the intervenors' contention that a technical basis for a conclusion could be found in, say, the witness' superior perspective or qualifications. Now, however, we must focus on whether as a practical matter the particular perspective and qualifications of the Martin team witnesses give their particular conclusions such "technical bases" as to warrant a reopening of the record. And although we are persuaded that the Martin team members do bring different and relevant perspectives and qualifications to the issues, in no case do we find these factors, by themselves, sufficient to warrant reopening the record.⁵

As a final matter, we turn to the single remaining issue raised by intervenor Sholly's motion to reopen. This issue has to do with the need for an audio or video recording system in the control room. In our Partial Initial Decision we resolved this matter as a safety issue within our jurisdiction. At the preliminary hearing we learned that the Martin team had recommended the installation of a recording system primarily to facilitate investigation of any future accidents. Witness Martin testified, at Tr. 27,160, that his team's investigation of the TMI-2 accident had been

⁴ Memorandum and Order, February 11, 1982, at 3.

⁵ The Martin team members themselves have not sought further review of their recommendations by this Board (or by any other authority to our knowledge). At the hearing the team's leader testified that the "recommendation" had been offered "for consideration" and not as positive "recommendations for change". Tr. 27,057-58. Also, although in ruling on the motions to reopen we have not relied on the team members' affidavits submitted in support of the Staff's pleading of September 30, 1981, those affidavits do indicate that the team members are generally satisfied that their recommendations received appropriate consideration from the Staff. For these and all other reasons discussed in this Memorandum and Order, we do not see this situation as one in which we should reopen the record on our own motion.

hampered by the lack of a recording system at that plant. The problem which witness Hunter illustrated at Tr. 27,162 with a concrete example, seems to be that the TMI-2 reactor operators had somewhat unreliable recollections of what occurred during the accident. The Board itself was impressed by this testimony. Although we consider it beyond our mandate to impose requirements solely for the purpose of facilitating future investigations, we do consider the point to be of sufficient apparent merit to warrant consideration by an appropriate part of the Commission. We therefore commend this matter to the Staff for such additional consideration as it may deem appropriate in light of the preliminary hearing transcript and our comments.

The motions to reopen are, however, denied.

IT IS SO ORDERED.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Ivan W. Smith, Chairman
ADMINISTRATIVE LAW JUDGE**

Bethesda, Maryland
April 26, 1982

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

**Before Administrative Judge Gary Milhollin
Acting as Special Master**

In the Matter of

**Docket No. 50-289
(Restart)
(Reopened Proceeding)**

**METROPOLITAN EDISON
COMPANY
(Three Mile Island Nuclear
Station, Unit No. 1)**

April 28, 1982

The Special Master, who was appointed by the Licensing Board to conduct a supplementary proceeding on issues connected with cheating on examinations, reports his conclusions and recommendations to the Licensing Board. The conclusions and recommendations concern actions by individuals, by the Licensee, and by the NRC Staff. With respect to individuals, the Special Master recommends that the Licensee not be permitted to use certain individuals to operate TMI-1, and that the Commission consider recommending criminal prosecution of certain other individuals. With respect to the Licensee, the Special Master finds that the Licensee did not encourage, condone, participate in, or know of the cheating by individual operators when that cheating occurred; however, the Special Master finds that the Licensee failed to review the NRC examination in good faith, that the overall integrity of the Licensee's operations staff was inadequate, that the Licensee was responsible for conditions which caused cheating to occur, that the Licensee's response to the cheating was inadequate, and that the Licensee's training program was inadequate. With respect to the NRC Staff, the Special Master found that the NRC examination was inadequately proctored and graded, that the content of the NRC examination was inadequate, and that the NRC Staff's investigation was adequate with respect to some of the cheating but inadequate with respect to other cheating. The Special Master recommends that the Commission take steps to assure itself that the NRC examination

does in fact test the type of knowledge which reactor operators should have.

APPEARANCES

Licensee, General Public Utilities Corporation:

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Nuclear Regulatory Commission Staff:

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Commonwealth of Pennsylvania:

Robert W. Adler, Esquire

Three Mile Island Alert, Inc.:

Ms. Louise Bradford, Ms. Joanne Doroshow

Mrs. Marjorie M. Aamodt and Mr. Norman O. Aamodt:

John Clewett, Esquire

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REPORT OF THE SPECIAL MASTER

SUMMARY

On April 23, and 24, 1981, the Nuclear Regulatory Commission gave licensing examinations at Three Mile Island Unit 1. The examinations were to test candidates for the positions of Reactor Operator and Senior Reactor Operator. Two of these candidates, who held supervisory positions, cheated extensively on both days and on both examinations by copying.

At about the time the copying was discovered, an Atomic Safety and Licensing Board was ready to publish a decision on the ability of the personnel at Three Mile Island to operate Unit 1 safely. The Board was making its decision after a long litigation which covered the training and testing program for reactor operators at Unit 1. It also covered the examination used by the NRC to verify the results of that training and testing program. The cheating cast doubt upon the training program, the testing program, and the NRC's examination. Therefore, the Atomic Safety and Licensing Board decided to reopen the litigation. The Board announced a supplementary proceeding, and appointed me Special Master to conduct it. This is the report of that proceeding.

The proceeding began with a prehearing conference on October 2, 1981; it ended with the testimony of the last witness on December 10, 1981. It consumed about 18 hearing days and over 3,500 transcript pages. 39 witnesses testified. My conclusions and recommendations are set forth below as follows: those concerning individuals are in ¶¶ 310-313, 315, 317, and 319; those concerning the Licensee are in ¶ 338; and those concerning the NRC Staff are in ¶ 342.

ORGANIZATION OF THIS REPORT

This report presents the following topics in the following order: first, the procedural background; second, the amount of cheating which occurred; third, management's involvement in the cheating; fourth, the Licensee's response to the cheating; fifth, the Licensee's training and testing program; sixth, the Licensee's system for certifying candidates; seventh, the NRC examination; eighth, the NRC Staff's response to the cheating; ninth, my overall conclusions.

I. PROCEDURAL BACKGROUND

1. The accident at Three Mile Island happened on March 28, 1979. At that time Metropolitan Edison Company, the Licensee, held a license to operate both Three Mile Island Unit 1 and Three Mile Island Unit 2. When the accident happened at Unit 2, the Licensee shut down Unit 1 voluntarily. The question then became whether Unit 1 should be restarted. That question was answered, at least temporarily, on July 2, 1979. The Nuclear Regulatory Commission ruled that it did not have "the requisite reasonable assurance that Three Mile Island Unit No. 1 . . . can be operated without endangering the health and safety of the public". The Commission also determined that a public hearing, before an Atomic Safety and Licensing Board, was required before restart would be authorized. In a further order on August 9, 1979, the Commission listed certain "short-term actions" which the Commission's Director of Nuclear Reactor Regulation had recommended be required of the Licensee before restart. The Licensing Board was to consider these actions in the public hearing. Among these actions were the following:

(1) . . .

- e.) Augment the retraining of all Reactor Operators and Senior Reactor Operators assigned to the control room including training in the areas of natural circulation and small break loss of coolant accidents including revised procedures and the TMI-2 accident [T]he licensee will conduct a 100 percent reexamination of all operators in these areas. NRC will administer complete examinations to all licensed personnel in accordance with 10 CFR 55.20-23.

(6) The licensee shall demonstrate his managerial capability and resources Issues to be addressed include . . . the management and technical capability and training of operations staff

CLI-79-8; 10 NRC 141 at 144, 145. The Licensing Board, in accordance with that order, held a public hearing. The Board received evidence on the Licensee's training program. It also examined the technical capability of Licensee's management and operations staff. The Board made extensive findings on these subjects (Partial Initial Decision of August 27, 1981, LBP-81-32, 14 NRC 381). On August 13, 1981, the Commission approved the Licensee's request to transfer to GPU Nuclear Corporation Metropolitan Edison Company's authority to own and operate TMI-1. (CLI-81-17; 14 NRC 299). GPU Nuclear then became the party before the Special Master in the supplementary proceeding.

2. The Licensing Board learned of the cheating in late July and early August, 1981. The first information was that two individuals had admitted cheating. Also, the NRC examiners were reported to have left examination rooms unproctored. After considering this information, the Licensing Board decided not to delay publication of its Partial Initial Decision (hereinafter, P.I.D.). However, the Board retained jurisdiction to consider further the extent to which the cheating might affect its findings. P.I.D. at ¶ 45; 14 NRC at 403. In particular, the Board left open its conclusions on the testing and licensing of operators. P.I.D. at ¶ 584 n.63; 14 NRC at 582. The Board then invited the parties to comment upon whether the record should be reopened for further litigation. Memorandum and Order of August 20, 1981. After considering the comments, it decided to reopen the record by means of the supplementary proceeding mentioned above. In addition to appointing me as Special Master, the Board also appointed me as technical advisor and informal assistant under the provisions of 10 CFR §2.722. Memorandum and Order of September 14, 1981. The Board then scheduled a prehearing conference for October 2, 1981, and directed the parties to present a list of issues for discussion.

3. As a result of that conference, the Board, in a Memorandum and Order dated October 14, 1981, ruled that the supplementary proceeding would consider the following issues:

The Broad Issue

The broad issue to be heard in the reopened proceeding is the effect of the information on cheating in the NRC April examination on the management issues considered or left open in the Partial Initial Decision, recognizing that, depending on the facts, the possible nexus of the cheating incident in the NRC examination goes beyond the cheating by two particular individuals and may involve the issues of Licensee's management integrity, the quality of its operating personnel, its ability to staff the facility adequately, its training and testing program, and the NRC process by which the operators would be tested and licensed.

Particular Issues

1. The extent of cheating by TMI-1 operator license candidates on the NRC license examinations in April 1981, and on any other Licensee- or NRC-administered examinations, including but not limited to the following: the Kelly examinations (including Category T) in April 1980; Category T make-up examinations subsequently administered by the company; the ATTS mock examinations in early April 1981; and such other examinations

- as the Special Master shall deem relevant. These latter shall include any other Licensee-administered qualification or mock exam or NRC-administered exam since the accident at TMI-2.
2. The adequacy of the Staff's investigation of, and NRC response to, the cheating incident and rumors of cheating in the April 1981 NRC examinations.
 3. The adequacy of Licensee's investigation of, and Licensee's response to, cheating or possible cheating in the examinations listed in Issue 1 above.
 4. [Proposed Issue 4 was combined with Issue 3.]
 5. The extent of Licensee management knowledge of, encouragement of, negligent failure to prevent, and/or involvement in cheating in the above mentioned NRC and Licensee examinations.
 6. The existence and extent of Licensee management involvement in cheating as alleged by the Aamodts in paragraph 7 in response to the Board's Order of August 20, 1981.
 7. The existence and extent of Licensee management constraints on the NRC investigation of cheating and rumors of cheating in the NRC April 1981 examinations.
 8. The adequacy of Licensee management response to the incident in July, 1979, referred to in the OIE investigation report and involving one of the two operators terminated as a result of cheating on the NRC April 1981 examinations.
 9. The adequacy of Licensee's plans for improving the administration of future Licensee qualification examinations for licensed operators and candidates for operator licenses, including the need for independent administration and grading of such examinations.
 10. The adequacy of the administration of NRC licensing examinations for TMI-1 personnel, including proctoring, grading, and safe-guarding the integrity of examination materials; the adequacy of the Staff's review of the administration of Licensee's Category T examinations; and the adequacy of the Staff's plan for retesting operators and monitoring its NRC examinations to assure proper adherence to NRC testing requirements in order to assure that the purposes of the NRC examinations, because of the nature of the questions, cannot be defeated by cheating, the use of crib sheets, undue coaching or other evasive devices.
 11. The potential impact of NRC examinations, including retests, and operator terminations on the adequacy of staffing of TMI-1 operations.

12. The sufficiency of management criteria and procedures for certification of operator license candidates to the NRC with respect to the integrity of such candidates and the sufficiency of the procedures with respect to the competence of such candidates.

4. On October 2, 1981, at the conclusion of the prehearing conference before the Licensing Board, I convened a conference among the parties who wished to participate in the supplementary proceeding. These were identified as follows: the Licensee, GPU Nuclear Corporation; the Office of Executive Legal Director, United States Nuclear Regulatory Commission (hereinafter, "NRC Staff"); Three Mile Island Alert (hereinafter, "TMIA"), represented by Ms. Louise Bradford; Mr. Norman and Mrs. Marjorie Aamodt. The Commonwealth of Pennsylvania also participated as an interested state under 10 CFR §2.715(c). After the parties were identified, I specified a list of issues, in addition to those specified by the Licensing Board, upon which the Licensee and the NRC Staff were required to present evidence. Special Master's Memorandum and Order following a Conference Among the Parties, November 8, 1981. At the close of the conference, I set a schedule for the balance of the proceeding. *Id.*

5. The parties conducted extensive discovery. It included numerous interrogatories, requests for documents, and depositions. It began on October 2 with an exchange of document requests at the prehearing conference. At my suggestion, the parties then met in negotiating sessions extending into the evening on October 2 to discuss the scope of the discovery and reduce their disagreements to a minimum. They took up the succeeding round of discovery in another negotiating session in a similar conference on October 16, 1981. Because of their diligence and cooperation discovery was accomplished quickly. Only a few rulings were required to be made by me (see Special Master's Memorandum and Order Following a Conference Among the Parties, October 27, 1981). I commend the parties for this effort.

6. Early in the proceeding, three individuals asked that their identities be held confidential. They had been implicated in cheating. The NRC Staff argued that this confidentiality was required by NRC's Rules of Practice and by the regulations which implement the Freedom of Information Act. The Aamodts and TMIA opposed confidentiality. They said it would prevent the parties from developing a full record on the issues. The Licensee's position was, first, that it had no legal right to withhold identities, but, second, that I should exercise my discretion to adopt a lettering system which would have the effect of withholding identities. After considering these arguments I decided that there was no right to confidentiality and that I would not grant confidentiality as a

matter of discretion (Special Master's Memorandum and Order on Confidentiality, October 22, 1981, LBP-81-50, 14 NRC 888). The Atomic Safety and Licensing Board affirmed this decision on appeal (Memorandum and Order Affirming Special Master's Order on Confidentiality, November 6, 1981, unpublished). At that point, the parties negotiated a stipulation on confidentiality. It provided that a system of letters be used instead of names; that the hearing be held *in camera* when certain individuals testified; that I issue a protective order prohibiting disclosure of names; and that the parties withdraw their appeal of the Licensing Board's decision affirming my order. I approved the stipulation and issued the order on November 12, 1981. The hearing was then conducted according to that stipulation.

7. On the first day that witnesses were called to testify, TMIA and the Aamodts moved that Licensee's witnesses be sequestered. Tr. 23,531-33. The parties then submitted, according to an outline which I suggested, a proposed order. It provided that certain listed witnesses would be excluded from the hearing room. Also, these witnesses would be prohibited from discussing among themselves certain listed matters during the period of time beginning on the date of the order and ending when the record should be closed. I signed the order on November 12, 1981. The hearing was conducted according to that order.

8. The parties presented considerable evidence on each of the issues listed in paragraph 3 above. The testimony began with Robert C. Arnold, President of GPU Nuclear Corporation. It continued with witnesses in progressively lower positions in the Licensee's management structure. The personnel in charge of the Licensee's control room, such as Reactor Operators, Shift Foreman and Shift Supervisors, testified extensively. Witnesses were also called from the NRC Staff. Members of the Staff's investigatory branches described the Staff's investigation of cheating; members of the Staff's training and testing branch described the Staff's administration of its examinations. The Aamodts called one witness, Mr. Harry D. Williams. His testimony was excluded for reasons described below. Practically all of the witnesses appeared voluntarily in public session. There were only two and one half days *in camera*. As to those, full transcripts were immediately available to the public. In scope and quantity, the testimony covered thoroughly those persons, documents and events most likely to reveal the depth and meaning of the cheating which occasioned this proceeding. In quality, however, the testimony was poor. This will be evident from the following discussion.

9. The Licensee's control room personnel will generally be designated by letters in this opinion if their position is Shift Supervisor or below. A list of those persons appears in Appendix A, together with each person's

job title. For those who voluntarily identified themselves when they appeared, the name is also given.

II. FINDINGS OF FACT

A. THE EXTENT OF CHEATING

O and W

10. This report must start with two persons, "O" and W". Both were Shift Supervisors at Unit 1 in April, 1981, when they took the NRC examinations. As Shift Supervisors, they were in charge of the control room and of the reactor while on shift. They supervised the shift foreman, the reactor operators, and any auxiliary operators who happened to be present. Each held a Senior Reactor Operator License granted by the NRC. When they were standing the evening and night shifts, their authority over the reactor would normally be higher than that of any other person present. They also were responsible for providing on-the-job training to control room personnel under their supervision. O, in particular, was interested in training. He invited persons on his shift to his home in the evening to study. He was known as a "head pounder" (Staff Ex. 26 at 37) and he had the reputation of studying more than anyone else at the plant (Tr. 26,568(I)). Both O and W were employed at Three Mile Island for many years; their peers regarded them as among the most competent persons in the division of operations. Upper management called them the "cream of the crop" Tr. 24,059 (Hukill).

11. However, they both cheated on examinations. The first time they cooperated was on April 2 and 3, 1981. On those days they took an examination prepared by Associated Technical Training Services (ATTS), one of the Licensee's contractors. That examination was to be a "mock" examination in preparation for the NRC examinations scheduled for April 21-24, 1981. A few days before the ATTS examination, W told O that W did not think he could pass it (Staff Ex. 26, Enclosure 5; Tr. 26,083-084 (W), 26,196 (O)). O replied with words to the effect of "don't worry, just sit next to me." *Id.* Then, O and W cooperated on the Reactor Operator (RO) examination given on April 2, and on the Senior Reactor Operator (SRO) examination given on April 3. Staff Ex. 26 at 17.

12. The next time they cooperated was on April 23, 1981, during the NRC examination for RO, and on April 24, 1981, during the NRC examination for SRO. This time, the cooperation was more extensive. On the SRO examination they gave virtually identical answers to most of the

questions; on the questions calling for essay-type responses, their answers usually read the same, word for word. The pattern was similar on the RO examination. Following are some examples:

Question A.6(a) on the RO examination:

O

No it does not mean that the core boron decreased from 1000 ppm to something less. What it means is that the density changed so that the boron, which is in the water, becomes less dense as you heat up. Hence the neutron is able to travel further before it is absorbed by a boron atom. This tends to have a positive effect on Keff because the thermal utilization factor will increase.

W

No it does not mean that the core boron decreased from 1000 ppm to something less. It means that the density changed so that the boron in the water becomes less dense so you increase temperature. Thus neutrons will travel further before it (sic) is absorbed by a boron atom. This will have a positive on Keff since the thermal utilization factor will increase.

Question H.3(a) on the RO examination:

O

At the feed water inlet there is an opening in which steam is drawn and comes in contact with the F.W. This is called aspirating (sic) steam and the heating is called contact heating - a form of convection heat transfer. The more flow you have the more aspirating (sic) steam you will have heating the feed water. When the feed water gets to the bottom of the down comer it is in a saturated condition.

W

At the feed water inlet there is an opening where steam is drawn and comes in direct contact the feed water. This is called aspirating steam and the heating is direct contact heating. The more flow you have the more aspirating steam is used through the aspirating parts to heat the feed water. This is a form of convection heat transfer. When the water gets to the bottom of the down comer it is in a saturated condition.

Question N.5(b) on the SRO examination:

O

On a load reduction you store energy in the OTSG and you get an insurge into the pressurizer. The insurge will cause the pressure to increase thus colloping (sic) the steam in the pressurizer. Since some of the pressure is maintained by the gasses in the pressurizer and they won't collopse (sic), you have pressure hanging up or staying higher for a longer period of time.

W

On a load deduction you store energy in the OTSG and there is an insurge into the pressurizer. The insurge will cause the pressure to increase thus colloping (sic) the steam in the pressurizer. Since some of the pressure is being caused by the gasses in the pressurizer and they won't collapse, pressure will hang up or stay higher for a longer period of time.

Id. at 14-16.

13. This copying was accomplished as follows: O, when he had completed an answer sheet, placed it face up on the table in front of him and to his left about two feet away from W, who sat at the same table as O, to O's left (Tr. 26,101-103(W)); W then read the answer from O's sheet or, if he could not see it clearly, leaned closer to the sheet, or moved the sheet closer to himself, copied it, and returned it., *Id.* This happened throughout both examinations (RO and SRO) on both days, while the NRC proctor was about 20 feet away. Tr. 26,207(O).

14. W testified that in addition to receiving help from O, he also gave it. W said that he whispered answers to O on four or five questions on each examination. Tr. 26,088(W). He also passed O a scrap of paper with an answer to question M-6 on the SRO examination. Tr. 21,111(W). O denied this (Tr. 26,201-203(O)), although he did admit whispering about how difficult the exam was. *Id.*

15. One of the most striking aspects of O's testimony was his reluctance to acknowledge that he had cheated. At first, he testified that he did not know W was copying. He said "I know that my papers were taken. I did not see any copying, actual copying. I did not see him actually write any answers." Tr. 26,199(O). O also said ". . . the way I look at it I did not cheat, because I did not copy any answers." Tr. 26,203(O). When asked why he left his answer sheets face up on the table, he said it was so he could save time by maintaining continuity from one answer sheet to the next. Tr. 26,208(O). It was pointed out, of course, that it would be impossible to achieve this purpose while his answer sheet was on W's side of the table. O admitted that it would have been easy to change the location of his answer sheets so that W could not reach them; he also

admitted that he could have declined to sit next to W on the second day of the examination, after W had removed O's papers on the first day. Tr. 26,2118-213(O). O even admitted that he *should* have done these things. Tr. 26,213(O). However, his conclusion that he should have done them appeared to come from the feeling that he would have avoided trouble if he had, rather than any feeling that honesty required it. Tr. 26,211(O).

16. O's attitude toward his own guilt showed a total lack of respect for the NRC examination. He felt quite free to help W subvert the examination. It also showed a failure to understand his responsibilities as a supervisor. O could not build respect for licensing requirements among those he supervised while he undermined those requirements himself. Nor could he think that W would build such respect. It was clear from O's testimony and his demeanor on the witness stand that he still does not acknowledge the character of his acts.

17. This refusal to see his own fault makes it difficult to believe that O was truthful when he denied copying from W. Denial advances O's effort to view his participation as passive. W had no reason to damage O unnecessarily; yet W was certain that he had helped O by passing him an answer on a scrap of paper, and was certain of the question on which he had helped him. Tr. 26,111(W). When O was confronted with W's statement, and asked whether he had received help from W, O said: "To my knowledge I did not." Tr. 26,223(O). He also stated that he "did not recall" asking W for any help. Tr. 26,285(O). My observation of O's demeanor at this time leads me to the conclusion that O was not being truthful. O had testified earlier that after telling W that W could sit next to him on the ATTS examination, O did not know whether W did so or not. Tr. 26,197(O). As pointed out in ¶ 11 above, W sat next to O and copied from O on both of the days when that examination was given. It is impossible to believe that under those circumstances O did not know W was there. My conclusion is that O also copied from W. Mr. Ward, the NRC's chief investigator, is of the same opinion. Tr. 25,385 (Ward).

18. Dr. Bruce Molholt, who testified on behalf of the Aamodts, asserted that he had documentary proof that O had copied from W. Molholt, ff. Tr. 25,185 at 2-3. He said that O's written answers showed that W was giving O answers orally which contained words O couldn't spell. This was because O had spelled words wrong which W had spelled right. *Id.* However, Dr. Molholt admitted that W, while copying answers from O's answer sheet, could have corrected O's spelling. Tr. 25,209 (Adler, Molholt). Consequently, Dr. Molholt's testimony was speculative on this point.

19. W did not respect the NRC examination either. When he was asked about his attitude toward it, he said "this particular exam was one . . . [we] did not want to . . . participate in." Tr. 26,130(W). When he was

asked why he cheated, he replied: "my feeling was, 'Here I am taking the test I do not want to take. I would like to get it over with, do well, and have it behind me.' That is basically how I felt." *Id.* Apparently, neither O nor W believed that it was part of his professional duty to show competence on the NRC examination.

20. O and W have also been implicated in other cheating. On weekly quizzes, W and GG gave similar answers which have not been explained by any theory other than copying. In 1979, O filled out answers to a make up examination which VV then submitted as his own work. These incidents are described below in ¶¶ 82-93, 220-237.

21. In sum, O and W were involved in a pattern of cheating; they were highly respected, senior employees in positions of importance to the public health and safety; they were supervisors with a duty toward subordinates; and, as will appear in ¶¶ 278, 327, below, their attitude toward the NRC examination was shared by many of their peers. The question of further action against O and W is considered in ¶¶ 305-310, below.

22. It is uncertain how much other cheating there was on the April examinations. The NRC Staff studied the answers of other candidates. No obvious copying was found. Staff Ex. 26 at 16, 17. However, at least one person received an answer in the hall (¶ 94), there was a request for assistance by telephone (¶ 123), there was another request for assistance in an unproctored room (¶ 102), there were rumors of crib sheets (¶¶ 130-132), there was a second person available continuously in the hall who could provide assistance, and that person offered assistance to at least one examinee (¶ 118). As stated above, the candidates had a poor attitude toward the examination. The proctoring was also poor (see ¶¶ 260-265, below). In light of the attitude, the proctoring, and the events just described, it is entirely possible that more cheating occurred on the April examinations than has been detected.

23. Dr. Molholt testified that other candidates must have seen O and W cheat, but did not report it. Molholt, ff. Tr. 25, 185 at 3. He said O and W gave nearly identical answers on 87% of the questions on the SRO exam (*id.* at 1) which meant that they must have cooperated throughout the nearly seven hours the exam was given. Four other candidates were in the room (Lic. Ex. 83); A and I sat directly behind O and W (*id.*) at a table about four or five feet away (Tr. 25,850 (HH)); W leaned in the direction of O's papers and moved O's papers across the table and back (see ¶ 12, above); the room was quiet (Tr. 26,040(A); Tr. 26,840(HH); Tr. 26,090(W)); O and W whispered (see ¶ 13, above). Dr. Molholt concluded that it was "hardly possible to imagine that these other operators were unaware of what O and W were doing." Molholt, *supra*, at 3. Mr. Ward found it "highly likely that other people would have noticed . . ." Tr. 25, 385. A and I, however, said they saw nothing. Tr. 26,043-44 (A); Tr.

26,536-537(I). Mr. OO, who was a very credible witness, said he saw nothing during the RO examination. Tr. 25,966(OO). HH's testimony was the same. Tr. 25,846-847(HH). To these denials one must add the fact that the NRC proctor, who was facing O and W, did not see the cheating.

24. If O and W could avoid the attention of the proctor, they could avoid the attention of other candidates; these latter, after all, were taking the examination. From the circumstances which existed, and my own experience in giving and proctoring examinations, I think it is more likely that A and I noticed the cheating than that they didn't. However, the evidence is not strong enough to support a firm conclusion. Absent such a conclusion, one cannot fairly charge a candidate with misconduct.

25. After the cheating by O and W was discovered, other investigations followed. The Licensee had Mr. Edward V. Trunk examine the answers to a series of different examinations. Mr. Trunk is an Assistant Professor of Engineering at the Pennsylvania State University, Capitol Campus. He was aided by one of his colleagues, Mr. Donald L. Miller. These men discovered several answers which appeared suspicious. The suspicion pointed to cooperation between W and GG, between S and Y, and especially between G and H. Trunk, ff. Tr. 24,831 at 5-6.

G and H

26. In their first study, Messrs. Trunk and Miller found that G and H had given identical responses to eleven different questions on three separate tests. Lic. Ex. 70A. The tests were quizzes, administered as part of the Licensee's weekly training program. The tests also served as make-up examinations. They were designed to satisfy the Commission's requirement that all operators be tested on the "lessons learned" from the accident at TMI-2 (see item 1(e) of the Commission's Order of Aug. 9, 1979, cited in ¶ 1 above). The test on "lessons learned" was known as "Category T." G and H were required to take the weekly quizzes on Category T as a make-up because they had failed the original Category T examination given in April of 1980. In a subsequent study, Trunk and Miller found two more sets of similar answers by G and H. Lic. Ex. 70E. These were on weekly quizzes having nothing to do with Category T. Still more similarities were discovered during the hearing.

27. In this first study, Trunk and Miller concluded that "a cooperative effort may have existed between G and H" on the weekly quiz of November 26, 1980. Lic. Ex. 70A. In their last study, on October 14, 1981, they stated that the similarities "appear to indicate that some

cooperative effort did take place . . ." on the weekly quiz of November 2, 1980. Lic. Ex. 70E.

28. The Licensee had Mr. John F. Wilson, one of its lawyers, follow up on these reports. Mr. Wilson interviewed G and H. He also looked for lesson plans and other information that might explain the similarities. He wrote up his interview notes, together with his conclusions, in a memorandum. TMIA Ex. 75. On the witness stand, he defended these conclusions in written testimony sponsored by the Licensee. Wilson, ff. Tr. 24,478. Mr. Wilson's conclusions are the Licensee's position on cheating by G and H.

29. G and H testified extensively. They were shown their examinations; they were taken through the similarities in their answers; they both denied copying. To decide whether G and H cheated, one must compare their similar answers, one at a time. The first similarity was on ATOG Question No. 3 on November 26, 1980. The candidates were asked to "list the four requirements for natural circulation." They answered as follows:

G	H
Heat source available to produce warm water	Heat source available to produce warm water
Heat sink available to produce cold water	Heat sink available to produce cold water
Connecting flow path available	Connecting flow path available
Cold water higher than warm water	Cold water above warm water
Lic. Ex. 66H.	Lic. Ex. 66G.

30. The answers are identical except for the last line, where H used "above" instead of G's "higher than." The lesson plan for this question, which consisted of a view graph and a handout, matched H's answer. TMIA Ex. 75, Attachment A. According to Mr. Wilson's notes, H indicated during his interview that the question "required a lot of straight memorization." TMIA Ex. 75 at 2. According to those same notes, G's response was similar to H's. *Id.*

31. Both G and H were asked on the witness stand to state the conditions for natural circulation. G did so accurately. Then, G was asked whether his response was one he had memorized. He replied: "No, it is common sense." Tr. 25,747(G). H was unable to state the conditions. He said he knew "some requirements." Then, he proceeded to name the first three given in his examination answer. Tr. 25,931(H). However, with respect to the fourth, he stated that it did not matter whether the heat sink was above the heat source or below it. He said that the gravitational position was "irrelevant." Tr. 25,932(H). For H at least, natural circulation is not a matter of common sense.

32. It is impossible to reach a firm conclusion on this item. G's response on the stand belies Mr. Wilson's notes. H's striking ignorance of natural circulation may mean that he did not answer the question honestly when he took the quiz, or that he simply memorized a formula and then forgot it. Straight memorization by both candidates cannot be ruled out when their answers repeat the training material. Of course, copying from the training material cannot be ruled out either, nor can memorization by one candidate followed by copying by the other. One is left uncertain, with insufficient evidence for a clear finding.

33. The second similarity is on Lessons Learned Question No. 1. The candidates were asked to "list two major areas of weakness noted by the Lessons Learned Task Force." G and H answered as follows:

G

Human factors, operational safety.
Lic. Ex. 66H.

H

Human factors, operational safety.
Lic. Ex. 66G.

The answer key to this question listed five areas of weakness. To obtain full credit a candidate could list any two of the five. The five are:

1. Man-machine interface
2. Training
3. Operator qualifications
4. Emergency operating procedures
5. Human element in design, operation, and regulation of system safety.

TMIA Ex. 75 at Appendix B.

34. According to Mr. Wilson's notes, G stated to Wilson that G chose these two answers because they seemed to be the most important of the five. TMIA Ex. 75 at 4. Also, G said these two answers may have been "drummed into" him. *Id.* The first time G and H gave these answers was on the quiz of November 26, 1980. When the same question was repeated on the quiz of March 27, 1981, G and H gave the same answers again. They explained this second similarity by saying that they had reviewed their quiz from November just before taking the one in March; thus, they knew the correct answer and repeated it. *Id.*

35. At the hearing, H could not recall why he chose these two answers. Tr. 25,889(H). G could not recall why he chose them either. Tr. 25,750(G). G said that "maybe" he had felt they were the most important, but he concluded: "I do not know why I chose those two." *Id.* Later, G said he believed his response was "the only right answer . . ." Tr. 25,807(G).

36. The answers given by G and H do not correspond to the answer key. The answer "Human factors" could be an approximation of "Man-machine interface" (answer key item 1) or "Human element in

design . . ." (answer key item 5), but the correspondence is not clear. The answer "operational safety" might also be an approximation of answer key item 5, but the correspondence here is even less clear. When G and H gave these answers the second time on March 27, 1981, the grader marked them wrong, taking off half of the available points. Lic. Ex. 66E, 66F. Either the grader believed that one of the answers did not state an area of weakness, or the grader believed that both answers were examples of a single area of weakness (number 5 on the answer key) rather than a statement of two areas, which the question required. Mr. Wilson testified that these answers were not given by any other candidate. Tr. 24,520 (J. Wilson).

37. The five items on the answer key are short phrases. They abstractly formulate large areas of subject matter. The phrases are vague, even somewhat arbitrary. Memorization is the only way such a list would be studied; yet, memorization is ruled out by the fact that the answers given do not correspond to the answer key. The class was usually taught around the answer key. Tr. 25,750(G). G's explanation that his answers seemed most important to him does not explain how H could have arrived independently at the same conclusion; also, it does not square with G's later statement that his response "was the only right answer." The Licensee, which filed proposed findings on several other similar answers given by G and H, did not do so on these. A conclusion here must take into account the lack of credibility revealed when G and H were questioned on other similarities (discussed below) and must also reflect the poor attitude and lack of proctoring which existed during these quizzes (also discussed below). The preponderance of the evidence is that these abstract, unique, identical, unexplained, and partially wrong answers were produced by cooperation.

38. The next item is Lessons Learned Question No. 2. It reads as follows: "The most important lesson learned fell into the general area of operational safety. What was the primary deficiency in this area?" G and H both responded: "Operator training." Lic. Ex. 66G, 66H. According to the answer key, the correct response was: "Inadequate attention paid to the human element." TMIA Ex. 75 Appendix B. G and H were both marked correct, however, when they gave this answer on November 26, 1980 (Lic. Ex. 66H, 66G) and G was marked correct again on March 27, 1981 when he and H gave it a second time to the same question. Lic. Ex. 66E.

39. When Mr. Wilson interviewed G and H they told him that "operator training" was "the only possible response" (TMIA Ex. 75 at 5). On the witness stand, Wilson said that he had looked at the responses by other candidates to this question and found "operator training" to have been a "universal response." Tr. 24,519 (J. Wilson). He also said that it

"appears to be the correct and only answer." Tr. 24,520 (J. Wilson). Mr. Nelson Brown, the training instructor in charge of the quiz, was also asked whether "operator training" was correct. Brown, however, said "I would have marked that wrong." Tr. 24,668 (Brown). One grader did mark it wrong on H's quiz of March 27, 1981, Lic. Ex. 66F. Brown marked it *right* on G's quiz of March 27, 1981 (Lic. Ex. 66E), which weakens the strength of Brown's testimony. At the hearing G repeated his view that his answer was the only possible one. Tr. 25,751(G). H, however, testified that the answer was *not* the only possible one; he said it was "the only one I could think of." Tr. 25,891(H). Although "operator training" does not correspond to the answer key, and may be wrong, the fact remains that many other candidates thought it was right. G and H could have independently followed the same process as the other candidates to arrive at this answer. The evidence on this item does not establish cooperation.

40. Accident Mitigation Question No. 3 asked the candidates to name two instruments used to measure water pressure. First, they were to name the instrument used to measure "narrow range" pressure; second, the instrument used to measure "wide range" pressure. On the quiz of November 26, 1980, G named "forced balance rosemont" and H named "forced balance" to describe the instrument used to measure narrow range pressure. Lic. Ex. 66H, 66G. Both responses were marked wrong. *Id.* The correct answer is that narrow range pressure is measured by a device known as the "Rosemount Pressure Transmitter." Lic. Ex. 82A. That device does not use a forced balance principle. *Id.* To measure wide range pressure, G named "bordon tube" and H named "bourdon tube." These were both marked correct, and are correct (except for spelling). Lic. Ex. 82B. On the quiz of March 27, 1981, the same question was asked again, but in a slightly different way. This time, the question which asked for the instrument to measure *wide* range pressure was part (a), and the question which asked for the instrument to measure *narrow* range pressure was in part (b). This is the reverse of the order in which the questions had been asked in November of 1980. In March of 1981 G answered "bordon tube" to part (a) and "Rosemont" to part (b), both of which are correct. H, however, apparently did not realize that the order of the questions had been changed. He answered "Rosemont" for part (a), which is incorrect since "Rosemount" is the correct answer for part (b), and he answered "forced balance bourdon tube" for part (b), which is incorrect since "Bourdon tube" is the correct answer for part (a).

41. On the witness stand G stated that "Rosemont is a trade name for forced balance. Forced balance describes the kind of instrument it really is." Tr. 25,752(G). He said he should have contested his grade when, on the quiz of November 26, 1980, he was marked partially wrong for the answer "Forced balance rosemont." Tr. 25,753(G). As stated above, the

Rosemont transmitter does *not* use the principle of forced balance. It is clear that G still does not know how this device operates. This is true despite G's having attended two successive training sessions on it, and having known during the second session that he was marked wrong on it during the first. G was also asked how the Bourdon tube operates. That device measures wide range pressure and works on a forced balance principle. Lic. Ex. 82B. G said it did *not* work on a forced balance principle. Tr. 25,798(G). Then, G admitted that he really did not know how the Rosemont worked; he said he simply thought of the words "Rosemont" and "forced balance" as belonging together. Tr. 25,800(G). He said he did not remember where he got the information (*id.*), or whether it was right (*id.*). He said "I never really questioned what Rosemont was for." Tr. 25,799(G).

42. H was also asked to explain his answers. H said that narrow range pressure is measured by an instrument called "Rosemont forced balance." Tr. 25,900(H). He was then asked to explain how "Rosemont forced balance" worked. He could not. He said: "The wording really does not make that much sense to me, because I do not work with a transmitter" Tr. 25,901(H). H attended two training sessions on this device, and his answers were marked wrong both times.

43. The most damaging fact here is that on the November, 1980 quiz, G and H both wrote "forced balance" (G added "rosemont") as an incorrect answer to the question on narrow range pressure. That suggests cooperation. Neither candidate knew the meaning of the words he was using; in fact, the words did not belong together. H also combined "forced balance" with "bourdon tube" in his wrong answer to part (b) on March 27, 1981. This flatly contradicts H's later testimony on the stand that, in his mind, "forced balance" goes with "Rosemont." The evidence on this item, while not conclusive, strongly suggests cooperation. The evidence also reveals that the training program did not succeed, from one session to the next, in actually teaching candidates materials in which they had shown they were weak.

44. On Accident Mitigation Question No. 4.a, of November 26, 1980, the candidates were asked: "Discuss how hydrogen gas is generated in the reactor coolant system and reactor building following a LOCA." G responded: "From aluminum, Zr water reaction." TMIA Ex. 75 at 7-8. H responded: "From aluminum, Zirc water reaction." *Id.* Both responses were wrong. *Id.* G and H were asked this question again on the quiz of March 27, 1981. This time, G responded: "From NaOH, Zr water reaction." *Id.* at 8. H responded: "NaOH & Zirc water reaction." *Id.* Again, both answers were wrong. *Id.* The correct answer is that hydrogen is produced by two separate reactions: the first is between aluminum and

sodium hydroxide; the second is between zirconium and water. Lic. Ex. 68B; Tr. 24,529-30 (Milhollin, J. Wilson). All four of these elements and compounds must be listed for full credit. *Id.*

45. When the grader marked G and H wrong on November 26, 1980, he wrote "NaOH" above "aluminum" on both candidates' answer sheets. Lic. Ex. 66G, 66H. This was done to show that sodium hydroxide should have been included with aluminum in the correct answer. When G and H were interviewed by Wilson, they told him that just before taking the quiz of March, 1981 they had studied their answer sheets from November, 1980. TMIA Ex. 75 at 8. Thus, they saw the words "NaOH," which had been written by the grader, next to the marks which took off points. They said they then repeated "NaOH" on the March quiz because they thought it was the right answer. *Id.* Obviously, they never learned the reactions. They had no explanation, however, for their original, incorrect answer of "aluminum" in November of 1980. *Id.*

46. On the witness stand, G and H were both asked for explanations. G gave several different ones. One was that his response of "sodium hydroxide" was "the right answer." Tr. 25,780(G). He defended this by saying that the answer of "sodium hydroxide" did not omit anything because "theoretically sodium hydroxide can react with most of the materials in the reactor building." Tr. 25,781(G). When he was asked why he had wrongly listed aluminum by itself, he said he knew the right answer but did not put it down. He explained:

"I had a test previously where I just put down sodium hydroxide, and when they graded the exam they wrote in the word 'aluminum'. And I figured all they wanted to see was the word 'aluminum'. So I just wrote 'aluminum' down . . . because I had recognized the question from a previous test."

Tr. 25,789(G). Of course, G was wrong about that. In fact, there was no quiz on which G could have seen this question before he took the quiz on which he answered "aluminum." Also, no grader had ever written the word "aluminum" on a quiz previously taken by G. The previously-taken quiz was the one upon which the grader had written "NaOH." When the error was pointed out, G changed his testimony. He said he couldn't remember whether he answered aluminum on the first or second quiz. Tr. 25,794(G). He admitted that he was confused. Tr. 25,795(G). G's third explanation was that by saying "aluminum," it was understood that one also meant "hydroxide." He said: "Normally no one never says aluminum hydroxide. You just do not bother saying hydroxide. It is taken for granted." Tr. 25,812(G). In addition, G said that by saying "sodium hydroxide," it was also understood that one meant "aluminum." According to G,

"a lot of times when you talk about sodium hydroxide-aluminum reaction, you either mention one word or the other. It is not

uncommon to just mention aluminum or not uncommon to just mention sodium hydroxide when you are talking about hydrogen production."

Tr. 25,812-813(G).

47. H's testimony was more direct. He was asked how, when he answered "aluminum zirc-water reaction," he envisioned the aluminum being a source of hydrogen. He responded:

I do not know what was going through my mind at that time. In other words, I do not know whether at the time I did not understand the reaction, or that I just forgot to put down sodium hydroxide.

Tr. 25,893(H). He was then asked how he ever could have thought that aluminum, alone, could generate hydrogen. He said: "I do not know." *Id.*

48. G's testimony, presented above, is not credible. Aluminum cannot produce hydrogen by itself, nor does it react with zirconium or water to produce hydrogen (it may oxidize slowly in water to produce hydrogen in minute quantities, but that is irrelevant to a LOCA). "Sodium hydroxide" is not a "right answer" to this question either, notwithstanding the fact that sodium hydroxide can react with various materials in the reactor building. G never saw "aluminum" marked on a previous quiz; his testimony on that point is a fabrication. Finally, it is impossible to believe that "aluminum" was commonly used as short-hand for the hydroxide reaction, or that "sodium hydroxide" was a short-hand reference to "aluminum." John Wilson reviewed the answers given by several other candidates who took the same quiz; no other operator answered "aluminum" without also mentioning "sodium hydroxide." Tr. 24,531 (J. Wilson). One is left without any credible explanation for identical wrong answers which in themselves make no functional sense. The evidence here shows that G and H cooperated.

49. ESAS Question No. 1, on March 27, 1981, asked the candidate to "list the process lines which are isolated on a reactor trip." G and H answered as follows:

G	H
MUV-3 letdown	MUV-3 letdown
WDG-V 3,4	WDG-V-3,4 Gas
WDL-V-304,303	WDL-V-303,304 (illegible)
WDG-V 534,535	WDL 584, 534 R.B. Sump
AHV 1A, B, C, D	AHV-1A,1B,1C,1D R.B. Purge
CAV 1,2,3,13	CA-V-1,2,3,13
CAV 4 A/B, 5 A/B	CA-V-4 A/B, 5 A/B
CAV 189	CA-V-189

CFV 19 A/B, 20 A/B

CFV-2A,2B
(Lic. Ex. 66E).

CF-V-19 A/B Sample, 20 A/B
illegible

CF-V-2A/SB sample
(Lic. Ex. 66F).

The above answers are in identical order. That order is not the same as the order listed in the lesson plan. TMIA Ex. 75 at Attachment C. When questioned by Mr. Wilson, G said that he listed these items "just the way he learned them, i.e., the first closures were the most important and the last four were in the position because of their lesser importance to plant function." TMIA Ex. 75 at 11. Mr. Charles Husted, the training instructor, stated to Wilson that the order on the lesson plan was *not* the order of importance, and that the order chosen by G and H was the order Husted would use if he were to teach the course again, except for one item. *Id.* Mr. Husted, however, was not a credible witness. See ¶¶ 109-110, below.

50. On the witness stand G said that he studied with H, and that the order listed on the training materials "was kind of messed up, so H and I, when we were looking at some of the changes in the plant . . . just put it in a logical order." Tr. 25,756(G). He added that "subconsciously maybe we both had them in the same order" Tr. 25,756-757(G).

51. When H testified, he said that he did not remember why he chose the particular sequence he used. Tr. 25,898(H). When H was asked to examine the sequence carefully, he noticed that the items were grouped by systems, which he felt he probably memorized, but he said he did not know why he memorized them that way. Tr. 25,937(H).

52. G's explanation is not credible in the face of H's testimony that H did not know why he used the order that he did. If H had studied with G, rearranged the order of items in a logical sequence, and then memorized it, H should have remembered what system he used. It remains possible that G and H memorized this particular order independently; however, no credible explanation has been given for such a coincidence. Without such an explanation, the evidence points to cooperation.

53. ESAS Question No. 1. b. on November 26, 1980 asked: "Where are the new radiation monitors located?" G answered: "Monitors are located in Unit #1 control room." Lic. Ex. 66H. H answered: "Control Room." Lic. Ex. 66G. Both these answers are wrong because the monitors are located in the plant, not the control room. Lic. Ex. 66G, 66H. Mr. Wilson did not investigate this item because he did not believe the answers were similar. He said: "I do not see that as a parallelism." Tr. 24,512 (J. Wilson).

54. The answers are in fact the same, and they are wrong. It is surprising that Mr. Trunk did not detect them. It is even more surprising that Mr. Wilson would contend that they are not really similar. No one

has explained how these wrong answers could have been arrived at independently. Without such an explanation, the evidence shows cooperation.

55. ESAS Question 2 of March 27, 1981 is the next item. It read: "List the new radiation monitors installed and the valves they close." G and H answered as follows:

G	H
RML-1--MUV 2A,2B	RM-G-16-CA-V-4A&5A
RMG-16-CAV 4A,5A	RM-G-17-CA-V-4B&5B
RMG-17-CAV 4B,5B	RM-G-18-CAV 1,2,3,13.
RMG-18-CAV 1,2,3,13	RM-G-19-MU-V-25,26
RMG-18-CAV 1,2,3,13	RM-G-20-WDL-V-303,304
RMG-19-MUV 25,26	WDG-V-3,4
RMG-20-WDLV 303,304	RM-G-21-WDLV-534,535
WDGV 3,4	(Lic. Ex. 66F).
RMG-21 WDLV 534,535	
(Lic. Ex. 66E.)	

Except for RML-1, the same monitors and the same valves are listed in the same order. Moreover, one of them is wrong. The response for RMG-19, according to the lesson plan and the answer key, is: "ALARM-Operator closes MU-V-33A-D." TMIA Ex. 75, Attachments D,E. Because the monitors are listed in numerical order, and because it would be logical to memorize them that way, cooperation is not indicated simply by the order in which the monitors are given. The fact that there is an identical error in both answers, however, indicates cooperation unless the error can be explained.

56. On the quiz of November 26, 1980 the same question had been asked. TMIA Ex. 75 at n.13. G and H had responded identically, and virtually the same way as they did on March 27, 1981. *Id.* In November their answers were marked right. *Id.* Those right answers in November, however, had become wrong by March because the training department had discovered that its teaching materials were wrong. Tr. 24,545 (J. Wilson). G testified that he made the error in March because he and H were not informed of the change. TMIA Ex. 75 at 16; Tr. 25,758(G). H took the same position Tr. 25,898-899(H). According to Mr. Samuel L. Newton, Operator Training Manager, the training department communicated that change to the shift supervisors, who were to pass it along to the operators in the control room. TMIA Ex. 75 at 16. E, the shift supervisor of G and H, told Wilson that he (E) believed that G and H were informed. *Id.* H told Wilson that H recalled learning of the change in the control room, although H apparently did not say or did not recall when he learned of it. *Id.* Wilson testified that "It was never my understanding that this information got to Messrs G and H in a timely fashion for them

to incorporate that into their thinking prior to taking the March test" Tr. 24,545-546 (J. Wilson). However, Mr. Wilson's memorandum, which he made at the time he investigated this item, did not contain this latter conclusion. TMIA Ex. 75 at 16.

57. This explanation by G and H, that they were not told of the change, is not supported by the testimony of Newton and E. However, it is clear that the change occurred, and that G and H looked at their November quiz before they answered the one in March. They repeated their answers from November, when they were marked right, without any apparent concern that they had become wrong. G and H must have ignored their training materials, which included the change. Does this prove cooperation? The weight of the evidence is that G and H were informed of the change. However, it remains possible that they were not. Since it is not certain that they were, one cannot rule out the possibility that they made the error independently. The evidence here points to cooperation, but it is not conclusive.

58. The last similarity comes from the weekly quiz of November 2, 1980. The question was: "Explain Bernoulli's Equation and its use in solving flow problems." G and H answered as follows:

G

Bernellis (sic equation is the general energy equation, it states that the total internal energy of a system is equal to the gravitational potential energy plus total kinetic energy of the system plus the system internal energy. Lic. Ex. 66A.

H

Bernoulli's equation is the general energy equation, it states that the total internal energy of a system is equal to the gravitational potential energy of the system plus the total kinetic energy of the system plus the system internal energy. We can use it to calculate flow by referencing to points in system and determine energy differences (work). Lic. Ex. 66B.

These answers are identical except for G's omission of the words "of the system" in the first sentence, and his failure to include the second sentence.

59. Wilson interviewed G and H and asked them if they had cooperated. They denied it. Wilson, ff. Tr. 24,478 at 7-8. Wilson, however, "could not find any lesson material which was supportive of their responses." *Id.* They also told Wilson that they probably would have memorized their answers. *Id.*

60. On the witness stand, G said at first that he had "most definitely" memorized this answer. He also said that he could not recall from what source he memorized it. Tr. 25,739(G). He said he did not answer the

second part of the question, which asked how Bernoulli's equation is used, because he probably forgot to do so; he said he often forgot to answer questions on tests. *Id.* Then he was asked to explain the equation from the witness stand. His answer was confused, and had little relation to the answer he gave on the quiz. Tr. 25,773(G). He said the equation would *not* be used in the plant and would *not* be used to calculate flow. Tr. 25,774-776(G). He said the equation "is about pressure losses through a piping system . . . [a]nd the final product would be in feet of head." Tr. 25,773(G).

61. At that point G was presented with H's answer, which said that the equation *can* be used to calculate flow, and does so by determining energy differences across points in a system. Lic. Ex. 66-B. G was asked to explain his testimony in light of H's answer. G then changed his testimony. He said that one *could* calculate flow with Bernoulli's equation. Tr. 25,776(G). He added that he, however, would not use it because flow could be calculated by other methods which are "easier." *Id.* He said that if one knows the flow going through a pipe of a given size, one "can extrapolate any other change in flow just by the square root of . . . [the] differential pressure." Tr. 25,774(G). It is obvious that the "easier" method is one application of Bernoulli's equation, and that G did not realize it.

62. G was also asked to explain why his definition was identical to H's. G said "we both memorized it." Tr. 25,815(G). When asked how he knew that H had memorized it, G said "I am assuming he did." *Id.* G testified that he could "only guess" where he and H found their unique definition. *Id.* However, G then proceeded to construct the theory that he and H had both memorized their definition from one of H's textbooks, or other material which H may have brought to the plant. G said:

"We often pulled definitions out of textbooks and other sources other than from Training Department . . . it is a different definition from the standard definition . . . and we think is a little bit better . . . Bernoulli's equation is a little tough to describe . . . [i]t is something you would try and find a good definition for somewhere and remember it."

Id.

63. G was then asked why he bothered to memorize the definition, since he had never been tested on it before, and, according to him, the equation was not used in the plant. G said he memorized it because he knew it was coming up in training and he wanted to prepare in advance. Tr. 25,818(G). When asked how he knew the equation would be coming up, he said he probably discovered training materials left in the control room by operators from another shift, who would already have been studying the equation during lectures. Tr. 25,819-820(G). He said that no

one specifically told him that the equation was coming up but that he might have noticed it because of its subject matter. He said:

You can memorize a few things. You can really, you know, the subject matter—and one of these strange things, Bernoulli, that is a strange thing. You know, who is this Bernoulli dude. It catches your eye as well. This is cool, I never heard of this stuff before, you know, maybe try to memorize it.”

Tr. 25,821(G). G also said that the training department placed a great emphasis upon Bernoulli's equation; he said “that was what the whole week was all about. The whole week was about Bernoulli's equation.” Tr. 25,822(H). Of course, this was not so. The quiz on November 2, 1980 covered the material given that week. Only one part of one category dealt with Bernoulli's equation. Tr. 25,822-823(H); Lic. Ex. 66A.

64. H also testified. He gave, from the witness stand, a clear definition of Bernoulli's equation which matched the answer on his quiz. Tr. 25,881(H); Lic. Ex. 66B. He said it would not be necessary to know how to use the equation to operate the plant. Tr. 25,884-885(H). He did not recall studying the equation with G. Tr. 25,884(H). He said he thought he memorized the definition during training week by copying it from the blackboard. Tr. 25,883(H). He was then asked whether he was “absolutely positive that it was written on the blackboard” Tr. 25,938 (Adler). He responded: “Pretty much so, yes.” Tr. 25,938(H). He added later: “the only way I could have gotten it would be from the blackboard.” Tr. 25,944-945(H). He said he did not know, before training week, that Bernoulli's equation was coming up. Tr. 25,938(H).

65. G's testimony is at its poorest here. His statement that he learned the equation by studying with H before training week is contradicted by H's testimony, and by G's earlier statement that he didn't remember where he learned the equation. It is also contradicted by other portions of G's testimony, where he declared: “I do not study.” Tr. 25,727(G). At that point G said:

“The only time I find myself studying at all is I will be on shift and people I am on shift with they will be studying, and then just to keep from being odd-and-out I will participate.”

Tr. 25,728(G). He also said: “I feel that I can walk in and just take an exam cold and pass it.” Tr. 25,729(G).

66. Cooperation seems to be the only explanation here. Mr. Wilson could not find any lesson material “which was supportive of their responses.” See ¶ 59, above. Mr. Wilson was diligent at finding such material (see ¶ 213, below). One must assume this means that other operators did not give this response (Wilson routinely checked responses of other operators in his investigation) and that it is not recorded in any training materials. The fact that G did not include H's second sentence is

not significant in view of G's habit of not answering questions fully. Tr. 25,739, 787-788(G). One is left again with unique, identical, and unexplained responses. Moreover, G's implausible explanation on the witness stand indicates that he was trying to hide something. G's testimony here, together with his demeanor, destroyed his credibility.

67. The similarities discussed above are not the only ones suggested. Others were mentioned at the hearing (Tr. 24,863-866 (Adler, Trunk)) or in exhibits (TMIA Ex. 7 at 14-15). I selected the ones above for discussion because they appeared to be the most suspicious. Others might have been included. For example, on Accident Mitigation Question 3.b. of March 27, 1981, G and H gave the same answer to the question, "How is the hydrogen removed from the reactor building?" They both answered, "hydrogen recombiner or purge." TMIA Ex. 75 at 9. This was the right answer, and the only answer, so giving it could not be evidence of cooperation. Also, on June 25, 1981, G and H gave similar responses to two questions on the third round of the Category T make-up quiz. *Id.* at 17,18. However, their answers were short, and corresponded to the answer key. *Id.* They are not evidence of cooperation either. My failure to discuss a similarity does not mean that I did not consider it.

68. Many witnesses described the conditions under which the weekly quizzes were given. These quizzes were part of the weekly training program which the Licensee conducted from March, 1979, the date of the accident at TMI-2, to April, 1981, the date of the NRC examination upon which cheating occurred. Newton, ff. Tr. 24,640 at 6-7. The Licensee also used weekly quizzes during the Operator Accelerated Retraining Program (OARP), which culminated in the comprehensive examination in April, 1980, given by Mr. Frank Kelly of PQS Corporation (*id.* at 7) and it used weekly quizzes in its training program from April, 1980 to April, 1981. *Id.* According to Mr. Newton, the Operator Training Manager, "formal procedures for exam and quiz administration during these programs did not exist." *Id.* Newton added that "written examinations and quizzes given in the classroom were generally proctored" (*id.* at 9), but he also said that he discovered, in August of 1980 or shortly before, that the instructors were not proctoring the weekly quizzes. He said that "exams were essentially being delivered to the room and were given to the individuals and whoever the instructor had been would then leave." Tr. 24,820 (Newton). Mr. Charles Husted, a training instructor, testified that he left weekly quizzes unproctored about 50% of the time. Tr. 26,922 (Husted). Mr. U said that about 80% of quizzes were unproctored during the OARP program. Tr. 26,806-807(U).

69. There was also evidence that operators discussed answers during the weekly quizzes. OO testified that cheating on weekly quizzes was "commonplace and accepted." Tr. 25,968-969(OO). He stated that the

operators discussed the quiz while it was being given (Tr. 25,972 (OO)) and that this practice was accepted by the operators who were involved. Tr. 25,971(OO). He admitted that he personally discussed questions and answers on more than one occasion (Tr. 25,982(OO)) and recalled discussing with P and Q the answer to a math problem. Tr. 25,975-976, 995-96(OO). He said he continued to take weekly quizzes during the period of time leading up to the NRC examination in April of 1981, but that quizzes became infrequent for him because he did not often study with his shift. Tr. 26,000(OO). He could not recall specifically whether the practice of discussing the quizzes continued during the period leading up to the NRC examination. *Id.*

70. U testified that the quizzes were taken as a "group effort," including those given during the OARP program. Tr. 26,806-807(U). He said he had cooperated with others and that it was unclear whether operators were supposed to do their own work. *Id.* He said that during the OARP program, quizzes were frequently taken to the control room and done on shift; the operators would then cooperate on the quizzes. Tr. 26,810(U). He said that during the quizzes given in class, the "question would be discussed so that everyone understood the correct answer to it and understood the material they were supposed to know for that answer." Tr. 26,811-812(U). He also said that books and other lesson materials were not removed from the tables in class during quizzes, that he had used such materials during quizzes, and that he had seen other operators refer to such materials during quizzes. Tr. 26,813(U). He said that often it was unclear whether the quizzes were to be open or closed book. *Id.*

71. W testified that he exchanged answers with other operators on take-home quizzes done in the control room. Tr. 25,153(W). O recalled hearing answers being discussed during the time when weekly quizzes were being administered (Tr. 26,232(O)) and O recalled one such discussion in which he participated with others on his shift (Tr. 26,233-234(O)). V said that he had seen cooperative effort on perhaps 5 to 10 percent of the questions on weekly quizzes over the past three years. Tr. 26,306(V). V also said that the practice of cooperation continued until August, 1981, when the cheating by O and W was discovered. *Id.* at 26,307. T said that some quizzes were a "group effort," that operators could work together on such quizzes, and that instructors were in the room at such times. Tr. 26,607-608(T). WW also said that cooperation occurred while the proctor was present. Tr. 26,453(WW). GG said that the quizzes were very informal, that there was no prohibition against talking, and that talking occurred. Tr. 25,696-697(GG). Mr. Husted, a training instructor, said that cooperation "was allowed on occasions" and that even when it was not allowed he remembers "having asked operators to do their own work . . ." Tr. 26,923 (Husted).

72. There was also some testimony to the contrary. G said the weekly quizzes were well-proctored and that there was no talking. Tr. 25,825-826(G). H's testimony was similar. Tr. 25,872-873(H). O testified that talking did not occur during the OARP program because the instructors, who frequently came to the site from elsewhere, gave their quizzes immediately after teaching their subjects, collected the quizzes, and left the site. Tr. 26,233(O).

73. The weight of the evidence clearly establishes that the proctoring on weekly quizzes was poor, that cooperation occurred, and that it was unclear whether operators were expected to do their own work. The Licensee admits this. See *Licensee's Proposed Findings of Fact and Conclusions of Law on Issues Raised in Reopened TMI-1 Restart Proceeding* (hereinafter, "*Licensee's Proposed Findings*") at ¶¶ 328-329, 332-333.

74. Mr. Trunk made an extensive study of the weekly quizzes; he found that "almost all of the exams and make-ups contained unusually varied answers . . ." Trunk, ff. 24,831 at 5. The exceptions to this pattern were the answers of G and H. In the words of John Wilson: ". . . out of the many, many tests and all the participants of those tests, they alone had this many parallelisms." Tr. 24,566 (J. Wilson). The sheer number of similar answers is striking. On the quiz of November 26, 1980, G and H gave the same answers to the following questions: ATOG Questions 2 and 3; Lessons Learned Questions 1 and 2; Accident Mitigation Questions 3.a., 3.b., 4.a., and 4.b.; ESAS Questions 1.a. and 1.b.. Lic. Ex. 66G, 66H; Tr. 24,509-512, 600-601 (J. Wilson); Tr. 24,863-865, 879-80 (Trunk). These questions represent almost half the point value of the quiz; they are 14.5 points of the possible 30.5. Lic. Ex. 66G, 66H. On the take-home quiz given March 27, 1981, the pattern was the same: G and H gave similar answers to questions worth 8 points of the possible 13.5. Lic. Ex. 66E, 66F. On the quiz given on November 2, 1980, G and H answered Question No. 1 (on Liquid and Gas Releases) with identical short responses which were uniquely worded, and they answered Question No. 2 (on Fluid Flow, Thermodynamics and Heat Transfer) with the long paragraph on Bernoulli's equation. Lic. Ex. 70E. Finally, G and H gave similar answers to two questions on the quiz of June 25, 1981. Lic. Ex. 66C, 66D, 70A, Appendix B. This is a remarkable string of similar answers; it separates G and H from all the other operators who took the quizzes.

75. Could G and H have independently memorized the same answers to all of these questions? G testified that he studied frequently with H while on shift. Tr. 25,728(G). H, however, said that he often studied alone at home, and with others on his shift, as did G. Tr. 25,867, 948-949(H). Moreover, most operators studied in groups (see, e.g., Staff Ex. 26 at 10, 22, 24, 25, 26, 27-28, 29) so the practice of studying together does not

explain why G and H alone showed similarities. Also, most operators relied upon memorization as a study technique. See, e.g., Staff Ex. 26 at 21, 26, 31, 34.

76. Could G and H have independently copied their answers from lesson materials? This is unlikely for several reasons. First, if lesson materials had been available to G and H the materials would have been available to others. No others showed the pattern of similarities established by G and H. Second, G and H both testified that no lesson materials were available during the quizzes. Tr. 25,737-738(G); Tr. 25,873(H). This was contradicted, of course, by U. See ¶ 70 above. Third, on some quizzes, such as the Category T make-up quiz given March 27, 1981, on which G and H gave very similar answers, no lesson materials were provided. On that quiz the candidates were instructed to review their materials from previous training weeks (Lic. Ex. 66E, 66F); G testified that he threw his training materials away after training week. Tr. 25,817(G). Fourth, for some of the subjects covered in the lessons, it is unlikely that written training materials even existed. Mr. Wilson was able to find only two handouts for all the quizzes at issue. TMIA Ex. 75. Finally, if G and H had copied their similar answers from lesson materials one would expect them to have passed the quizzes. In fact, they failed them over and over again.

77. One is forced to conclude that G and H cooperated on the quizzes. Neither memorization nor the use of lesson material can explain the number and nature of the similarities. There are simply too many instances which are unexplained. Moreover, the testimony seeking to explain them is false. The poor proctoring, the cooperation by others, and the general acceptance of cooperation, are all factors which reinforce this conclusion.

S and Y

78. On the quiz of December 19, 1980, S and Y gave identical answers to ATOG Question 1. That question asked the candidates to "[d]escribe how the ATOG program proposes to simplify the operator's problem of identifying and reacting to (treating) abnormal transients." TMIA Ex. 76 at 1. Both candidates responded: "By developing symptom oriented guidelines." *Id.* According to the answer key, the correct response is:

By shifting from the former traditional method of event oriented guidelines to symptom oriented guidelines. (Including operating instructions and an engineering basis and operating principles as training aid.)

TMIA Ex. 68B. The material used in the training course also answered this question; it said: "Depart from traditional method of *event* oriented guidelines. Develop *symptom* oriented guidelines." TMIA Ex. 76, Attachment 1.

79. S stated to Mr. Wilson that he had not cooperated with Y and that the answers to questions such as this were usually memorized. TMIA Ex. 76 at 3. Mr. Wilson did not interview Y, who was on an "indefinite personal leave of absence." *Id.* at 2. Neither S nor Y testified at the hearing. The responses by S and Y were both marked correct by the graders (TMIA Ex. 76 at 1). Mr. Wilson testified that the training department was looking specifically for the words "symptom oriented guidelines." J. Wilson, ff. Tr. 24,478 at 10; Tr. 24,554. The evidence here does not establish cooperation.

80. ATOG Question No. 3 on this quiz asked the candidates to "[l]ist the four (4) requirements for natural circulation." TMIA Ex. 76 at 1. The responses were as follows:

S	Y
Heat source available to produce warm water	Heat source available to produce warm water
Heat sink available to produce cold water	Heat sink
Connecting flow pater available	Connecting flow path available
Cold water above warm water	Cold water higher than warm water
TMIA Ex. 76 at 2.	TMIA Ex. 76 at 2.

According to the answer key, the correct answer is:

- 1) Heat source available to produce warm low density water
- 2) Heat sink available to produce cold high density water
- 3) A flow path available connecting the two
- 4) The cold water (cold thermal center) must be above the warm water (warm thermal center).

Lic. Ex. 68B (ATOG Question 12)

Both of these responses are correct. S's response is identical to that of a "transparency" used in the training program and entitled "Requirements for Natural Circulation." TMIA Ex. 76, Attachment 2. Y's response is also identical, with the exception of the omission of the words "to produce cold water" after "heat sink", and the substitution of the words "higher than" for the work "above." These responses are also similar to those of G and H, discussed above in ¶¶ 30-33.

81. Both of these responses are correct. Since at least four candidates (S, Y, G and H) wrote responses that were virtually verbatim recitals of the training materials, one must conclude that the responses could have been memorized. The evidence here does not show cooperation.

GG, W and MM

82. On the quiz of December 19, 1980, Lessons Learned Question 1 asked: "List two (2) major areas of weakness noted by Lessons Learned taks (sic) force." GG, W and MM answered:

MM	W	GG
Non safety related systems affecting safety systems operator action compounding the challange (sic) to safety systems. Lic. Ex. 66K.	Non safety related systems affecting Safety related systems (challenges (sic) the system) and operator action which compounded the challanges (sic) to the safety system. Lic. Ex. 66L.	Non safety related systems affecting safety related systems (challenges (sic) the system)-and- Operator actions which compounded the challanges (sic) to the safety system. Lic. Ex. 66M.

83. On the same quiz, Lessons Learned Question 2 asked: "The most important lesson learned fell into the general area of operational safety. What was the primary deficiency in this area?"

GG, W and MM answered:

MM	W	GG
Operator training inadequate Lic. Ex. 66K.	Operator training allowing actions which challenged (sic) the automatic actions of the safety related system. Lic. Ex. 66L.	Operations training allowing actions which challenged (sic) the automatic actions of the safety related systems. Lic. Ex. 66M.

84. According to the answer key, the correct responses to these two questions were:

Lessons Learned Question 1 [any two of the following responses received full credit]

1. Man-machine interface
2. Training
3. Operator qualification
4. Emergency Operating procedures
5. Human element in design, operation, and regulation of system safety.

Lic. Ex. 68B.

Lesson Learned Question 2

- inadequate attention paid to the human element.

The responses by GG, W, and MM were marked right, although it is evident that they are quite different from the answer key.

85. John Wilson interviewed both GG and MM. J. Wilson, ff. Tr. 24,478 at 11-12. Both GG and MM denied cheating. *Id.* According to Mr. Wilson, GG insisted that he had not looked at W's answers nor had he allowed W to look at his. *Id.* at 12. GG did admit, however that W may have looked at his (GG's) answers without GG's knowing. *Id.* Wilson did not interview W because W was no longer employed at TMI-1 at the time of GG's interview. *Id.* When Mr. Hukill interviewed GG in October of 1981, GG's statement to Mr. Hukill was similar to the statement GG made to Wilson, except that GG added that there may "have been a handout that was the same . . ." Tr. 24,083 (Hukill).

86. At the hearing, GG testified that he did not copy from W. Tr. 25,695(GG). GG also said, however, that he was not sure whether W had copied from him. *Id.* He said "I do not believe that the seriousness of the exam was felt by anybody in the room, the instructor included." *Id.* He said the atmosphere was very informal, that talking frequently occurred during the weekly quizzes, that the talking was about the answers to the questions, and that course materials were available. Tr. 25,696-697(GG). He recalled where he sat; he recalled that W was present; but he could not recall whether W sat next to him. Tr. 25,694(GG). GG had no explanation for the similarity between his answers and W's, except the possibility that W could have copied. Tr. 25,695(GG). GG said "if he [W] had sat behind me, it is a possibility that he might have looked over my shoulder or maybe he overheard me talking about the exam in the hallway or up at the front of the room after I finished the exam. Tr. 25,698(GG).

87. W also testified. His testimony was somewhat inconsistent. First, he said he "may have" discussed his answer with GG. Tr. 26,144(W). Then, he said he did *not* copy from GG. Tr. 25,145(W). Later, he said that he was unsure whether he cooperated or not, because he did not recall the particular quiz, and the quiz could have been a take-home quiz done in the control room where cooperation on quizzes frequently occurred. Tr. 26,153(W). He was asked to give a response to Lessons Learned Question 1 from the witness stand. His response, though correct, was completely different from his response on the quiz. Tr. 26,138(W).

88. GG, W and MM all misspelled the word "challenge" in the same way when they answered Lessons Learned Question 1. They all spelled it "challange." Lic. Ex. 66K, 66L, 66M. Because this fact was overlooked by Mr. Trunk, Mr. Wilson, and all the parties, there was no attempt to explain this similarity on the record. MM's answer was slightly different from the two others, but it contained this same misspelling. Lic. Ex. 66K.

89. The parties also failed to develop another feature of the three responses: the language used. An expression such as "non safety-related systems affecting safety systems operator action which compounded the challenges to the safety system" (Lic. Ex. 66K, 66L) does not flow spontaneously from the pen of an operator. When W answered this question from the witness stand, he said "procedure inadequacies and operator training." Tr. 26,138(W). This is a correct answer, and the sort of response that an operator, working alone, would be expected to give. It is revealing to compare the answers of S and Y to the answers of GG, W and MM. S and Y took the same quiz in the same room as GG, W, and MM. Lic. Ex. 70A, Appendix A. S's response reads: "Operator training, Human engineering of controls room." Lic. Ex. 66I. He received full credit for this answer. *Id.* Y's response, for which he lost only one quarter of a point, reads: "Need a well designed plant. Need well trained operators." Lic. Ex. 66J. These are natural responses in ordinary language. The stilted abstractions used by GG, W and MM do not occur as natural expressions, and could hardly occur in identical form to three operators working alone and answering in their own words.

90. The same similarity in language occurs between GG and W on Question 2. S and Y, who both answered "operator training" to this question, received full credit. Lic. Ex. 66I, 66J. GG and W came up with "Operator training allowing actions which challanged (sic) the automatic actions of the safety related systems." See ¶ 83, above. It is totally improbable that GG and W could have independently formulated these identical answers using the words they chose.

91. Copying seems to be the only explanation. Either a first operator copied the answer to Question 1 from training material or some other source, and the other two copied from him, or the three of them copied the same training material. One of the three could have memorized this answer, and the two others could have then copied it, but it is unlikely that any of the three would have memorized such a clumsy string of words simply to answer a quiz. Training material is the most probable source of these similarities. It is unfortunate that the Licensee was unable to find any training material on these questions. Tr. 24,570-71 (Wilson).

92. The case of MM is slightly different from that of GG and W. The latter two appear to have cooperated on both Question 1 and Question 2. MM's answer to Question 2, however, is not the same as those of GG and W, which shows that MM did not cooperate on that question. Nevertheless, MM's identical, abstract language on Question 1 remains, together with the identical misspelling. It is impossible to believe that MM could have arrived at the same language and the same misspelling independently. MM must have cooperated on Question 1, or copied the same training material.

93. It is more difficult to know who copied from whom. The only evidence is a marked-out word in GG's answer to Question 1. GG began his answer with the word "poor." Then, he crossed out the word and repeated the abstract formulation identical to W's and MM's. Lic. Ex. 66M. This suggests that GG copied from either W or MM, but it is not enough, standing alone, to support a conclusion that he did. The credibility of GG's denial was undermined when he said that "it is a possibility that he [W] might have looked over my shoulder or maybe he overheard me talking about the exam in the hallway." See ¶ 86, above. Such an explanation does not square with the language used in the answers, and the extent of the similarities. Regardless of who copied from whom, or from which material they copied, it is clear that copying occurred. Given the extent and nature of the similarity between the answers of GG and W, the copying appears to have occurred with GG's participation.

Mr. Shipman at the coffee machine

94. Mr. Henry Shipman, a licensed senior reactor operator, left the non-smokers' examination room to get a cup of coffee during the "A" set of examinations. This was on either April 21 or 22, 1981. While he was at the coffee machine, he was approached by another person who asked him a question, which he answered. Arnold, ff. Tr. 23,590 at 10; Hukill, ff. Tr. 23,913 at 14; Staff Ex. 28 Encl. 2. He stated to the NRC investigators that he assumed that the individual who asked the question was also taking the examination, and had come from the smokers' examination room, because only one person was allowed out of each room at a time. Staff Ex. 28 Encl. 2. He said the question asked was on the examination. *Id.* However, he was unable to remember the specific question, his response, the identity of the person who asked it, or whether he was asked on April 21, during the RO examination, or on April 22, during the SRO examination. *Id.* He did remember, however, that no one other than he and the other individual were present at the time. *Id.* He said the encounter was very brief, only long enough to pour a cup of coffee. *Id.*

95. Mr. Shipman did not report this event until he was interviewed by Mr. Hukill on October 7, 1981. Staff Ex. 28 Encl. 3 at 2; Hukill, ff. Tr. 23,913 at 13-14. He reported it voluntarily then in response to one of Mr. Hukill's questions. *Id.* After he reported it, Mr. Hukill questioned him vigorously in order to discover more information, but Mr. Shipman was unable to recall anything beyond what is reported above. Tr. 23,986-987; Tr. 24,091-092 (Hukill). Mr. Shipman reviewed a list of the persons who took the examination in the smokers' room (there were eight (Lic. Ex. 83))

but he still could not remember the name of the questioner. Tr. 26,361 (Shipman). The NRC investigators did not ask any of the eight persons in the smokers' room specifically whether they had asked Mr. Shipman the question. Tr. 25,364-367 (Ward, Baci); Tr. 25,371-372 (Ward). The Licensee did not ask them either. Tr. 23,990-991 (Hukill).

96. None of the NRC investigators who testified believed that Mr. Shipman was being truthful. Tr. 25,368 (Baci, Ward). They did not think he would have remembered the event without remembering the question and the questioner. *Id.* Both Mr. Arnold and Mr. Hukill admitted to skepticism. Tr. 23,696 (Arnold); Tr. 24,091-092 (Hukill). Nevertheless, the Licensee became convinced that Mr. Shipman was telling the truth. Tr. 23,696-697 (Arnold); Tr. 23,987-988 (Hukill). The Licensee determined that the discipline for Mr. Shipman's unacceptable behavior would be to issue a letter of reprimand, which it did. Arnold, ff. Tr. 23,590 at 10; Hukill, ff. Tr. 23,913 at 14-15. Mr. Shipman's good record over seven years' employment and his previous good character were taken into account in reaching this decision. *Id.*

97. There are several reasons why Mr. Shipman's statement is difficult to accept. The first is his background in the nuclear program of the United States Navy. Mr. Hukill described at length the high level of honesty and integrity expected from those in the Navy program. Mr. Hukill said that the Navy program instilled in those within it the principle that cheating "is totally unacceptable and cannot be tolerated." Hukill, ff. Tr. 23,913 at 3. Mr. Shipman admitted that his conduct at the coffee machine, if it had occurred in the Navy, would have been "shocking." Tr. 26,403 (Shipman). Mr. Shipman also testified that he would have been shocked if someone had asked him for an answer during a weekly quiz at TMI. *Id.* at Tr. 26,376. He admitted that the NRC examination was more formal than the weekly quizzes (*id.*), and said that he would have been shocked if someone asked him for help during the NRC examination. *Id.* at Tr. 26,377. He was then asked whether he *was* shocked when someone *did* ask him for help during the NRC examination. He responded:

At the time it was — it was as if, you know, it was spontaneous. I did not think — I was not thinking in terms of assisting someone else. I was thinking in terms of, here is a question and I know the answer, and I blurted it out.

Id. He was then asked again whether he was shocked. He said: ". . . I wasn't thinking in terms of shock." *Id.* He was then asked whether he was surprised. He said: "Again, I wasn't thinking in terms of being surprised." *Id.* He also testified that he was "concerned that I had done something wrong" (*id.*) and he said that he recognized that it was wrong shortly after he did it. Tr. 26,378 (Shipman). In his statement to the NRC investiga-

tors, he said that "I realized it was improper on my part but I did not think it was significant enough to constitute a cheating incident." Staff Ex. 28 Encl. 3 at 2. finally, he was asked whether he was sure he had never given a spontaneous response to aid someone during a weekly quiz. He said that he was sure he had not, and said "I am sure because I probably would have some remembrance if I did . . ." *Id.*

98. The second reason Mr. Shipman's statements are difficult to accept is his managerial position at TMI-1. Mr. Shipman is senior operations engineer at TMI-1. *Id.* at Tr. 26,349. He assists Mr. Ross "in the supervision and direction of operating activities." Tr. 23,882 (Arnold). He is Mr. Ross' "right hand man in the control room" (Tr. 24,073 (Hukill)) and considers himself part of management. Tr. 26,388 (Shipman). In such a position he would have the responsibility to know about the ability and integrity of the operators under Mr. Ross' supervision. Any information about this ability or integrity, such as a question asked during an examination, would fit into the pattern of information he already had about the person, and would have been important enough to remember.

99. Mr. Shipman's explanation for his inability to remember is that he did not attach any significance to the event when it occurred. He said that he replied "automatically" because "we are always asking each other questions prior to examinations and at other times just to keep current and fully informed . . ." Staff Ex. 28 Encl. 3 at 2-3. This explanation is only plausible if one believes that such an attitude would actually exist in the mind of someone with Mr. Shipman's background and responsibility. His background is in the Navy nuclear program, and his responsibility is to serve as Mr. Ross' "right hand man in the control room." Also, his testimony that he was concerned that he had done something wrong indicates a feeling of culpability, which is inconsistent with his view of the event as "insignificant." His testimony that he would have been shocked, but he "wasn't thinking in terms of shock" diminished his credibility.

100. The weight of the evidence on this issue is that a person with Mr. Shipman's background, responsibility, and feeling of culpability soon after the event, would have been surprised by the solicitation and concerned enough about it to have remembered who made it. Mr. Shipman's statement that he remembered that the question was on the NRC examination, and that it was asked at the coffee machine while he and the questioner were alone, but that he remembered nothing else, is too improbable to accept. I conclude, as did the NRC investigators, that Mr. Shipman was not being truthful.

P and Mr. Husted in the unproctored room

101. P, a shift supervisor at TMI-1, was interviewed on September 25, 1981 by the NRC investigators. During his interview, he expressed anger about the fact that Mr. Bruce Wilson, the NRC proctor, had left the examination room unproctored. Staff Ex. 27 at 40. P said that he took pride in his ability to do well on examinations, and said that he was so determined to take the NRC examination that he sat for it while being treated for pneumonia. *Id.* He said that Wilson's absence "made him vulnerable to any allegation of cheating" because it "removed a potential witness to his [P's] honesty and put him in the uncomfortable position where he could be solicited by other examinees." *Id.*

102. Mr. Ward, one of the NRC investigators, testified that he became curious about the strength of P's feelings on this subject. Tr. 25,462 (Ward). Mr. Ward concluded that P's "vehemence was rather strange, and it suggested . . . the possibility that he had in fact been solicited." *Id.* After it had been established that P and Mr. Husted were alone in the smokers' room (the room was unproctored because the NRC proctor was reviewing the NRC examination with Messrs. Ross, Brown, and Bolz (see ¶ 140, below)) Mr. Ward pursued the matter further, as follows:

So within that framework, by that time we had established there were only two people in the room, Husted and himself, that it would be worth pursuing that matter a little bit further. And I then said to him the reason why you are so upset about this is it puts you in an awkward position when Husted asked you a question, and he looked startled, and he started to hesitate. And I said something to the effect that we knew he [Husted] had asked the question, and he [P] said well, he only asked one question . . . I was playing out the thing which I assume Ms. Bradford noticed when she looked at the statement that he seemed to be very upset about — more upset about the situation than a hypothetical situation would warrant. So it was within that context that the information about Mr. Husted came to the fore. We pursued it a bit further. He [P] related that it was just one attempt. He could not remember specifically what it was, to my recollection. It was more like what a certain concept was, well, what in the hell does this mean or words to that effect. And when he [P] refused to answer it, no further questions were asked. That is my recollection of how that element of information came in.

Tr. 25,462-463 (Ward). Mr. Ward also testified that the question asked was related to the NRC examination (*id.* at Tr. 25,463) and that he believed P's statement was true. *Id.* at 25,320.

103. The NRC Staff did not include this incident in its investigatory report. Staff Ex. 27 at 40. Mr. Ward stated that the reason for not including it was that it was not really an act of cheating; it was only attempted cheating because the answer had not been given. Tr. 25,320 (Ward). Mr. Ward discussed this interpretation with Mr. Stello, who is Mr. Ward's superior at the NRC, and Mr. Stello agreed with it. Tr. 25,418 (Ward). Mr. Ward did not tell the Licensee of P's statement (Tr. 25,418-419 (Ward)) and did not confront Mr. Husted with it. Tr. 25,317 (Ward). The reason for not confronting Mr. Husted was that Mr. Husted had already been interviewed twice and had twice denied cheating. *Id.* The Staff's response to this incident is discussed below in ¶ 300.

104. On the witness stand, P denied that there had been a solicitation, or that he had told Mr. Ward of one. Tr. 26,691-692(P). P said that when Mr. Ward suggested that Mr. Husted had asked P a question, P turned to Mr. Ward to reply, but Mr. Baci asked P another question before P could respond to Mr. Ward. Tr. 26,692(P). Then, according to P, Mr. Ward said "he was not interested in that particular fact." *Id.* P said he then "let . . . [Ward's suggestion] slide . . . , " and never responded to it during the interview. *Id.*

105. Mr. Husted also testified. He specifically denied asking P the question. Tr. 26,937 (Husted). Mr. Husted said that he and P did not discuss anything during the examination. Tr. 26,936 (Husted). He said he was totally unaware of P's activities during the time the two of them were alone in the unproctored room. *Id.*

106. These conflicts in the testimony can only be resolved by judging credibility. In order to make such a judgment, it will be necessary to review some additional testimony by P and Mr. Husted. P testified on a number of subjects. One of them was the weekly quizzes. P was asked whether he had ever seen operators cooperate on weekly quizzes. P said: "I have not seen any cooperation between the operators." Tr. 26,702(P). He added, however, that operators may have "asked for a clarification of what the question was if there was not a proctor in the room," but he said that the operators did "not . . . [ask] one another for answers on the quiz." *Id.* This was directly contradicted by OO, who testified that he specifically recalled discussing with P and Q the answer to a math problem. Tr. 25,975-976, 995-996(OO). Although OO testified that cooperation occurred on a number of occasions, only in this instance was he confident enough to name specific individuals. OO also implicated himself by giving this testimony. In general, OO seemed determined to testify accurately, and was careful not to make accusations without adequate support. See ¶¶ 118, 121, below.

107. P was asked on the witness stand to explain why, if he had not been solicited for an answer, he had told the NRC investigators that he was angry at the absence of a proctor, and "in the uncomfortable position where he could be solicited by other examinees." See ¶ 101, above. He replied that his statements to the NRC investigators had referred to his attitude *at the time of his interview by them*, rather than to his attitude at the time of the examination. Tr. 26,691, 724, 729-30(P). He testified that at the time of the examination, he was *not* concerned about being solicited. *Id.* P was then asked to explain a series of responses he had made to questions asked of him during his deposition. In that deposition, P was asked whether the proctor was in the room during the NRC examination in April. He responded: "From time to time." Tr. 26,745(P). Next, he was asked to describe the times when the proctor was absent. He responded that the proctor was often gone and that he "was not paying . . . too much attention." *Id.* Next, he was asked whether the operators behaved differently when the proctor was gone. He responded: "No, I did not notice any difference." Tr. 26,746(P). Next, he was asked whether anyone solicited any information from him. He responded: "No." *Id.* Next, he was asked, "Did you feel there was a potential for that happening when the proctor was out of the room?" He responded: "Yes." Tr. 26,746-748(P). He was then asked whether, when he responded to all of the above questions, he interpreted the questions as referring to the time of the examination. Tr. 26,745-746 (Adler). He said he interpreted all of the questions as referring to the time of the examination except the last one. Tr. 26,745-746(P). With respect to the last one, in response to which he had admitted that he felt there was a potential for solicitation, he said: "I interpreted that question to mean, 'Do you feel that there was a potential' at the time of the question." Tr. 26,746(P). It was then pointed out that all the questions in the series had used the same tense, and so he was asked why he suddenly attached a different tense to the last one. Tr. 26,746 (Adler). He responded: "Apparently, my prethinking of the question had colored my judgment of the tense of it, and either I made a mistake or—or I answered it in the present tense." Tr. 26,749(P). During this exchange, P's demeanor was not that of a forthright witness.

108. It is apparent that the above explanation by P is not credible. There was no basis whatever for his claim that he mysteriously understood the tense of the latter question on his deposition to be different from that of those which preceded it. His answer of "yes" to that question conforms to the meaning of the statements which he had already made to the NRC investigators. He told the NRC investigators that the proctor's absence "put him in the uncomfortable position where he could be solicited." Staff Ex. 27 at 40. One does not become "uncomfortable" retroactively. It is

obvious that his response of "yes" to the latter question on his deposition referred to the time of the examination. His denial that it did was plainly untruthful, and undermined his credibility.

109. Mr. Husted's credibility must also be examined. Mr. Husted was first interviewed by the NRC investigators on July 29, 1981. Staff Ex. 26 at 39. The last paragraph of the investigators' report read as follows:

HUSTED was queried concerning the possibility of reference material being covertly brought into the classroom by examinees. However, for unknown reasons, he declined to respond to this question or explain his reluctance to discuss this issue. He was also asked whether any rumors or comments regarding instances of cheating on the exams had come to his attention. He acknowledged that he had heard rumors to this effect which he labeled as "unconfirmed hearsay." However, HUSTED refused to reveal any specifics of the rumors he had heard or to identify the individuals (if named) who were allegedly implicated. Upon further attempted questioning, HUSTED declared he could not recall anything concerning what he had heard.

Id. The Licensee admitted that Mr. Husted's answers "were sometimes flippant" and that "he appeared at times to consider the questions in a less than serious manner." *Lic. Proposed Findings* ¶ 204. It is clear from the paragraph quoted above that Mr. Husted refused to cooperate with the NRC investigation.

110. The NRC investigators interviewed Mr. Husted a second time on September 18, 1981. Staff Ex. 27 at 16. He was asked to clarify what he had meant by "unconfirmed hearsay" in his first interview. According to the NRC investigators, Mr. Husted then stated that:

he did hear one comment made during the time period of the NRC RO/SRO exams where someone (he did not recall who) said they saw someone (the unidentified person did not say who) passing papers in the exam. [Mr. Husted] stated he heard the comment in the area near the coffee pot and men's room in the trailer that was located between the two classrooms. He said . . . he did not know if the above mentioned comment relating to "passing papers" was being directed at him or not; further, he did not know if the person was referring to the NRC exams or some other exam.

Id. Mr. Husted adopted this statement as his testimony. Tr. 26,914-915 (Husted). This information, if true, supports Mr. Ward's opinion that other candidates noticed the passing of papers between O and W. See ¶ 23, above. Mr. Husted was asked on the witness stand about this second

statement. He confirmed that the "passing papers" incident was the same as the "unconfirmed hearsay" he had mentioned during his first interview. Tr. 26,928 (Husted). Then, the following exchange occurred:

Q In the last paragraph on page 39 [the report of the first interview], it states that you refused to reveal any specifics of the rumors you heard or identify the individuals who were allegedly implicated? Why did you refuse to answer that question?

A I do not know. Stupid, I think.

Q You were being interrogated by NRC investigators regarding cheating at TMI. You are a member of the training department. You have stated it is part of your responsibilities to help prevent cheating at TMI. And you are telling me that you refused to answer a question regarding rumors of cheating at TMI because you were stupid?

A I did not like the way the investigation was conducted. I did not like the questions that were being asked. They were so broad and vague that I could not give a specific answer. And I think out of lack of anything other to say, I just told them that I did not want to answer the question.

Tr. 26,928-929 (Adler, Husted). This attitude, together with Mr. Husted's generally flippant demeanor, convinced me that Mr. Husted was not a credible witness. In fact, when one compares his testimony on the witness stand with the sequence and content of his NRC interviews, it appears that he deliberately withheld the information about "passing papers" until his second interview.

111. In contrast to this testimony of P and Mr. Husted, Mr. Ward's testimony was entirely forthright. Mr. Ward described exactly how P's admission was obtained. Mr. Baci, who also testified, was present when the admission occurred. Mr. Ward reported P's admission to Mr. Stello. Mr. Ward was extremely cautious in making accusations; there is no reason whatever to believe that he would accuse P falsely. Both P and Mr. Husted gave testimony which was not forthright. Also, they both had an interest in denying the solicitation. P's version of the interview requires one to believe that the NRC investigators asked P whether he was solicited, and then told him immediately that they weren't interested in the answer. I find that the clear weight of the evidence here is that Mr. Husted solicited information from P during the NRC examination.

U in Mr. Husted's office

112. U has been the subject of more rumors and other indications of cheating than any operator at TMI-1. The issues fall into several categories. The first issue is whether, during the NRC examination in April of 1981, U was stationed near the examination rooms to assist examinees. The second issue is whether U telephoned KK during this examination to ask for help on a question. The third issue is whether U used crib sheets. Each of these issues is discussed below.

113. The most serious allegation of cheating at TMI-1 is that, during the NRC examination, someone was stationed near the examination room in order to look up answers for examinees. A number of operators heard that someone was available. Tr. 26,534(I); Tr. 26,486-487(KK); Tr. 26,217-219(O) (O heard the rumor from multiple sources); Tr. 26,168-169(W); Tr. 25,987-988(OO). In most cases, the rumor was linked specifically to U. Mr. I said that U was named in that rumor (Tr. 26,534(I)) and so did O (Tr. 26,217-219(O)) and W (Tr. 26,168-169(W)). OO was the only person to testify that he heard the rumor *before* the NRC examination was given. OO said that "I heard that for the April exam, that someone would be posted in a trainer's room to help out if we had any questions." Tr. 25,986(OO). OO also said that "I heard that someone was going to be posted in Chuck Husted's office, which would, of course, not be occupied by him." Tr. 25,988(OO). KK told the NRC investigators that he had heard that "the person [stationed outside the examination room] was performing his duty . . . with at least the knowledge of someone higher up in the company." Staff Ex. 27 at 30. On the witness stand, KK added that his impression of the rumor was that the presence of this person would be known by the examinees. Tr. 26,489(KK).

114. On the morning of April 23, 1981, before the "B" set of NRC examinations began, U sought Mr. Husted's permission to use Mr. Husted's office. Tr. 26,916 (Husted). U had already taken the "A" examinations for RO and SRO on the two preceding days (April 21 and 22, 1981). Staff Ex. 27 at 36. Mr. Husted, who was going to be taking the "B" examinations himself on April 23 and 24, and thus was not going to be using his office, agreed. Tr. 26,916 (Husted). After making these arrangements, U went to the non-smokers' examination room. Tr. 26,888(U). He then spent 20 to 25 minutes chatting with the examinees. Tr. 26,879-880(U). This conversation included the content of the "A" examination, which U had just taken, and "may have" described specific questions and answers on that examination. *Id.* O, A, Z and S were among those present. *Id.* Mr. Paul Collins of the NRC Staff testified that the "A" and "B" sets of examinations were so similar that knowledge of questions and answers on "A" would give a candidate unfair advantage on "B." Tr.

25,146-147 (Collins). When the NRC proctor arrived to distribute the examination papers, U returned to Mr. Husted's office (Tr. 26,880(U)) where he spent almost all of the next two days. Tr. 26,825-827; Tr. 26,881(U).

115. U said that he spent the two days in Mr. Husted's office in order to study. In particular, he said he was studying for his oral examinations, which he believed were scheduled for the following August, 4 months later. Tr. 26,829-830(U). He said his study method was to review old written examinations, from TMI and other facilities, because they were "a very good source of questions." Tr. 26,831(U). When U was interviewed by the NRC investigators, he told them that he had time available to study because he "was assigned to study with the Category IV Trainees through April 24, 1981." Staff Ex. 27 at 37. On the witness stand he confirmed that this was his assignment (Tr. 26,834-835(U)) but he stated that he did not in fact study with the Category IV Trainees because as a member of management, he had a certain amount of independence. He said: "I was also management personnel, and I can kind of run my own life a little around there." *Id.*

116. U said that he chose Mr. Husted's office as a place to study because it was "close to the coffee pot, close to the soda machine [and had] lots of reference material in it." Tr. 26,876(U). According to U, operators usually studied in an empty classroom (Tr. 26,876(U)) but on April 23 and 24 the classroom normally used for this purpose was being used as the smokers' examination room. *Id.* Mr. Husted testified, however, that there were four empty classrooms still available in the training complex where U could have studied. Tr. 26,917-918 (Husted). U had never studied in Mr. Husted's office before April 23 and 24, and has never studied there since. Tr. 26,876(U).

117. U was interviewed by the NRC investigators and cross-examined on the witness stand. He made a written statement in which he said he did not "assist, facilitate or otherwise encourage anyone . . . to cheat," and he denied "providing information to anyone who was in the process of taking the NRC exam. . . ." Staff Ex. 27, Encl. 12 at 2. He insisted, however, that the word "knowingly" be inserted in front of each of these denials. *Id.* On the witness stand, he was asked why he wanted this word to be inserted. He said he could have unknowingly provided help in the following way:

I could have met him [an examinee] in the hall, passed them [examinees] in the men's room, at the soda machine, at the candy machine, and they asked me a question, and spontaneously I answered it, but I do not remember doing that, but it is possible. Tr. 26,837(U). He also testified that he would not have considered it cheating to give someone an answer to the NRC examination if the answer

were a brief answer. Tr. 26,837-838; Tr. 26,874-875(U). Finally, he said that although he did not remember meeting any specific person at the coffee machine, "it is not unlikely" that someone taking the examination could have received a brief answer from him there. Tr. 26,837-838; Tr. 26,862-863(U).

118. During the "B" set of examinations OO left the examination room to go to the coffee machine. OO testified that while he was there, making a cup of tea, U appeared in the hall from the direction of Mr. Husted's office. Tr. 25,991-992(OO). During an exchange of greetings OO became convinced from U's demeanor that an implied offer of assistance was being made. Tr. 25,988(OO). OO stated: "I assumed that he [U] had come from that office [Mr. Husted's] and was just more or less trying to give me the opportunity to . . . ask a question." *Id.* See also Tr. 25,998(OO); Tr. 26,004(OO). I observed OO's demeanor; he was a very credible witness. Although he stated later that he felt he may have "jumped to the conclusion at the time" (Tr. 25,998(OO)), there is no reason to question OO's belief that an implied offer of assistance was indeed made. OO had not heard, before seeing U at the coffee machine, that U was the person who would be available. Tr. 26,004(OO). U said he did not remember talking to OO (Tr. 26,829(U)), but he said would not have offered OO assistance. Tr. 26,877-878(U).

119. U's stated reasons for being in Mr. Husted's office are not convincing. First, U could not recall ever having studied in Mr. Husted's office before the NRC examination, or after it. Tr. 26,876(U). Empty classrooms were normally used for such study and were available. Tr. 26,917-918 (Husted). Mr. Husted's office contained training materials, old written examinations, and a telephone; it was equidistant from the examination rooms and was accessible to anyone going from those rooms to the men's room or the coffee machine. Tr. 25,423 (Ward); TMIA Ex. 61. The training materials would have been helpful to someone who was studying; those same materials, plus the old examinations, the telephone, and the office's location, also would have been helpful to someone who was assisting examinees. Tr. 25,423 (Ward).

120. Second, U had just finished 16 hours of NRC examinations over the previous two days. He admitted that he was somewhat exhausted afterward. Tr. 26,831(U). Other examinees couldn't imagine beginning to study for another examination immediately after the one they had just written. See e.g. Tr. 25,713(GG); Tr. 25,771(G). The oral examinations for which U contends he was studying were 4 months hence by his own account. Tr. 26,829-32(U). Mr. Ross and Mr. Hukill testified that the oral examinations were approximately six months hence and that the operators knew it. Tr. 24,209-10 (Ross); Tr. 24,076 (Hukill). It is very difficult to

believe that after two grueling days of examinations, an operator would begin at 8:00 a.m. the following day to study for an oral examination six months hence.

121. U's testimony that he might have unknowingly provided a brief answer amounts to a "non-denial." He was unable to say that he had not rendered assistance; he said that if he had given a brief answer he would not have considered it cheating; and he said that it was "not unlikely" that someone could have received a brief answer from him at the coffee machine. See ¶ 117, above. By contrast to U's hedging, OO's testimony was clear and forthright. From OO's demeanor, it was obvious that he was reluctant to make statements against his employer's interests, and reluctant to incriminate a fellow employee. Nevertheless, OO seemed determined to report accurately everything he knew about cheating, including things which could be detrimental to himself. See, e.g., ¶ 69, above. I found OO's testimony to be convincing, and to have established, together with the other evidence discussed above, that U in fact offered him assistance.

122. There was no firm evidence that U offered or gave assistance to anyone other than OO. U's trip to the examination room did enable him to tell the examinees where he would be located, and thus fits the rumor heard by KK that the examinees would know where to find assistance. Also, U's ostensible reason for being in Mr. Husted's office was not plausible, and U probably telephoned KK during this time. See ¶¶ 123-129, below. However, this evidence is insufficient to establish that U was "stationed" in Mr. Husted's office. There was no independent evidence to show that U was "stationed" either by management or his fellow employees. The rumor reported by KK, that "someone higher up in the company" knew that assistance would be offered, was unsubstantiated. The conclusion is that the evidence does not show that U was "stationed"; but the evidence does show that U cheated by offering OO assistance. U's discussion of the "A" examination with those who were about to take the "B" was not prohibited by the NRC proctor (this is discussed further in ¶ 265, below) but U, as "management personnel," should not have overtly and deliberately compromised the examination's integrity. The offer of assistance to OO was clearly an act of cheating.

The telephone call to KK

123. KK reported that while he was on duty in the shift supervisor's office on Thursday, April 23, 1981, he received a telephone call. The caller identified himself as U. Staff Ex. 27 Enc. 8 at 3. QQ was also in the shift supervisor's office; he and KK discussed the call immediately after it was

made. *Id.* at 3 & 6. QQ could not remember whether the call came in on the speaker phone or whether his recollection of it came from his discussion of it with KK. Staff Ex. 27 at 39. KK said the caller asked a question which was "along the lines of what happens to fuel pin temperature over core life if an oxidizing layer builds up on a cladding surface." Staff Ex. 27 Enc. 8 at 5. QQ confirmed that this was the question asked. Staff Ex. 27 at 39. KK was aware that an NRC examination was in progress, so he asked the caller if he was taking it. Staff Ex. 27 Enc. 8 at 6. The caller then responded: "No, I am helping O take his." *Id.* KK said he then told the caller he would not answer the question until the examination was over *Id.* That ended the conversation. *Id.* KK could not identify the voice of the caller as belonging to U. *Id.*, Encl. 8 at 5.

124. U was asked on the witness stand whether he placed the call. He said that he did not call KK for the purpose of asking the question described by KK, since he felt it was an easy question to which he already knew the answer. Tr. 26,844-845(U). U said, however, that he "could" have called KK with a question, and that if he had made such a call he "may" have said it was about a test question, although he could not remember having made such a call to KK or anyone else. Staff Ex. 27 at 37-38. He explained that by "test question" he meant one of the old examinations from which he was studying in Mr. Husted's office. Tr. 26,846(U). He said:

If I had — if I had a question on heat transfer, Mr. KK would have been the individual I contacted. And I cannot definitely say that I did not talk to Mr. KK that day. But I know a question like it is alleged that I had asked, I would not have required Mr. KK's assistance on.

Tr. 26,844-845(U). U testified that he learned of KK's allegation at the time of the NRC investigation, but that he never spoke to KK about it. Tr. 26,864-865(U).

125. KK and O were friends. Tr. 26,483(KK). KK told the NRC investigators that he (KK) told O about the telephone call at the first opportunity. KK said:

O was taking the test Thursday and Friday, as I remember and it was the first opportunity I got after that when I was with him alone. I can't remember what day of the week that was, if it was Saturday or if it wasn't until the following Monday. It was at some point in time when he and I were alone and I told him what had happened . . . that I had gotten a phone call and that the guy who called said he was helping O take an NRC test. I specifically asked if it was true cause I was surprised would have been

surprised had it been true. Knowing O the way I do and he said, no, it wasn't true that he hadn't asked for or sought in any other way to get help on his exam. And I believe him.

Staff Ex. 27 Encl. 8 at 8. O testified that he was very angry when he learned of the telephone call. Tr. 26,259(O). He was asked whether he went to U to find out whether U had made it. O said: "I was going to, but I never got around to it. I never did it." Tr. 26,258(O). O said that he didn't go to U because O believed he must have been told of the call only after the investigation started, and by that time he was "no longer able to" (i.e., he had been fired). Tr. 26,259(O).

126. Mr. Ward, with the assistance of others, compared the question KK was asked with the questions on RO and SRO examinations. The question was not on either. Staff Ex. 27 at 31. In fact, as U pointed out, the question was on the ATTS examination, which was given in April of 1981, a few weeks before the NRC examination was given. *Id.* at 44.

127. The evidence above is extraordinarily confusing. KK, who was a forthright witness, contradicted O, who was not a forthright witness (see ¶ 15-17, above), with respect to when O learned of the call. KK was certain that he told O immediately afterward; O was unsure when he was told. Tr. 26,259(O). Thus, one must find that O was told immediately afterward. The fact that O did not confront U is very suspicious. O's reputation, and perhaps his job, were at stake if the call became known. Under these circumstances one cannot believe that O would not have confronted U if O were in fact innocent. From this, one concludes that O was not innocent and that O had no need to confront U.

128. U's statement that he "could" have called KK; that he would have called KK if he had a question about heat transfer; and that he could not "definitely say . . . [he] did not talk to Mr. KK that day" lead one to think that he did call KK. Mr. Ward concluded that it was "highly likely" that he made the call. Tr. 25,359-360 (Ward). This conclusion is reinforced by U's position in Mr. Husted's office, where he had access to old examinations, the examinees, and the telephone. See ¶ 119, above. The weight of the evidence is that U made the call.

129. However, the question asked was not on the NRC examination. Since this is so, it cannot have been cheating to ask it. Both KK and QQ were certain of the question. Thus, one is left with a mystery. Why would anyone ask a question which most operators could answer easily? O said he knew the answer Tr. 26,272(O). Why would U deny asking a question which was on the ATTS examination? Why would O, who was not a shy person, fail to confront U after learning of something so damaging to O's reputation? One possibility is that U could have been "testing" KK before asking the "real" question. If that were so, however, it would have been unnecessary to mention O. Of course, U could have mentioned O

“spontaneously,” without thinking about the consequences. Since there is no evidence to support this theory, however, it does not go beyond speculation. On the evidence in the record, one has the equivalent of Charlemagne dying of a gunshot wound.

Rumors about U

130. The Licensee was informed on July 27, 1981 that the NRC was beginning an investigation into cheating at TMI-1. On the following day, July 28, Mr. S. Polon, Manager, Employee Communications, went home to lunch. His wife was there. His wife told him of a telephone conversation she had had with the wife of P. P was a Shift Foreman at Unit 1. Commonwealth Ex. 8. During that conversation the two women had discussed a previous conversation they had had regarding rumors about cheating. *Id.* They also discussed rumors that they had each been told previously by the wife of T. *Id.* T's wife appears to have told them these rumors before June of 1981. Aamodt Ex. 7. T was a Control Room Operator at Unit 1. When Mr. Polon returned to the office, he told Mr. W.L. Gifford, Vice President Communications, what his wife had said. Commonwealth Ex. 8. Mr. Gifford immediately notified Mr. Arnold and Mr. Arnold immediately notified the NRC investigators. *Id.* On August 27, 1981, Mr. Polon and his wife again discussed the rumors. Mr. Polon's wife said that she had heard that U wrote on his hand and took crib sheets into the NRC examination. *Id.* When Mr. Arnold and Mr. John Wilson learned from Mr. Polon what Mr. Polon's wife had said, they interviewed U and T. Commonwealth Ex. 9. U denied the cheating alleged in the rumor. *Id.* T said he had no idea where his wife heard the rumors. *Id.* T also said that “his wife was an unreliable source.” *Id.* At the conclusion of this interview, Mr. Arnold and Mr. Wilson were not able to determine whether U was being honest. *Id.* Mr. Wilson and Mr. Lloyd then interviewed U again. *Id.* This time, Wilson and Lloyd concluded that U's denial was honest, and that there was no reason to believe the rumor. *Id.*

131. There was other, circumstantial, evidence concerning U and crib sheets. O stated that either A or P told him that U had used a crib sheet during the Kelly examination. Tr. 26,274-275(O). T and U are close friends (Tr. 26,819(U)), so T and his wife would be in a position to know whether U had used a crib sheet. During the examination U sat facing the wall, with his back to the proctor (Tr. 26,817; Tr. 26,854(U)), a position which would have made it difficult for the proctor to have observed a crib sheet. U took his briefcase into the examination and had access to it while the proctor was out of the room. Tr. 26,840-841(U). When U was

interviewed by the NRC investigators, he spontaneously reported to them that cheating would have been difficult on the NRC examinations, and he said the reason was that they were "very . . . different from previous exams." Staff Ex. 26 at 33. At the hearing, he explained that by this statement he meant that it would have been difficult to prepare "cards" or "crib sheets." Tr. 26,842(U).

132. In view of the other events and allegations concerning U, the above evidence is troubling. However, this evidence is insufficient to establish that U in fact wrote on his hand, or that he used crib sheets during the examinations.

The telephone call to WW

133. WW was on duty in the shift supervisor's office in April of 1980 while the Kelly examination was being given. Staff Ex. 28 Encl. 1. He received a telephone call from a person who did not identify himself. *Id.* The person asked him: "What are the indices on the DNB curve?" *Id.* WW answered the question, because it "wasn't unusual for people to call up and ask questions." *Id.* Later, WW discovered that the question had been on the Kelly examination. *Id.* He did not disclose the telephone call during an interview with the NRC investigators because the investigators confined their questions to the NRC examination. *Id.* Although the caller's voice was familiar, WW could not identify it. *Id.*

134. There is no reason to doubt that the telephone call was made, or that it was cheating. However, that is about all one can say. There is no way to discover who the caller was if WW cannot identify the voice. If one believes that WW did not suspect the reason for the question, WW's response was innocent. One concludes that there is an uncaught cheater in this episode, as was the case in the episode with Mr. Shipman.

VV and O in 1979

135. In 1979, in satisfaction of a required make-up examination, VV submitted as his own work answers which were in fact written by O. This clearly constituted cheating by VV, and the weight of the evidence established that it also constituted cheating by O. The incident is described in ¶¶ 220-237, below.

B. MANAGEMENT'S INVOLVEMENT IN CHEATING

136. There is no evidence that management encouraged, condoned, participated in, or knew of the cheating by O and W when it occurred. Nor is there any such evidence with respect to any of the other persons mentioned above. Or at least, that is true with respect to "upper" management. There are only four issues under this heading: The first is whether Michael Ross, the Manager of Operations at Unit 1, facilitated cheating by keeping the NRC proctor away from the examination room. The second is whether Mr. Ross improperly caused the answer key to the NRC examination to be broadened. The third is whether Licensee's management was involved in cheating on a test in 1979 for radiation work permits. The fourth is whether, or to what extent, persons such as O, W, VV, Husted and Shipman should be considered "management" for the question of "management involvement."

Keeping the proctor away from the examination room.

137. When the NRC gives an examination at a facility, it is the NRC's practice to have the questions and answers reviewed by senior members of the facility's staff. Staff Ex. 29 at 3. This is done to insure that the questions and answers are currently valid for that facility. *Id.* Another purpose is to insure that the questions are clear enough to be understood. Tr. 25,498-499 (B. Wilson). This review is done while the examination is in progress; it is not done beforehand because of the risk that the questions will be disclosed to the candidates (Boger, ff. Tr. 25,480 at 5; Lic. Ex. 27, Enclosure 3) and it is not done afterward because by then it will have become too late to correct the questions before they are answered.

138. In April of 1981, every licensed individual at TMI-1 who was capable of reviewing the NRC examination was also scheduled to take it. Ross ff. Tr. 24,127 at 2. This is unusual. Ordinarily, the NRC examination is given to a half-dozen or so candidates who are seeking an NRC license for the first time. Tr. 25,131 (Collins). In such cases senior operators, who already hold licenses, are available during the examination to review the questions and answers with the NRC examiner. *Id.* At TMI-1, however, there were no "extra" senior operators available; they were all taking the examination.

139. Two separate sets of examinations were given. The "A" examination for RO was given on April 21, 1981; the "A" examination for SRO was given on April 22, 1981; the "B" examination for RO was given on April 23, 1981; the "B" examination for SRO was given on April 24, 1981. The RO examination lasted nine hours; the SRO examination lasted

seven hours. All the licensed operators who would have been qualified to review the "A" set of examinations on April 21 or 22 were either taking it on those days, or were scheduled to take the similar "B" set of examinations on April 23 and 24. The operators who were scheduled to take the "B" examination would have been available physically to review the "A", but could not do so without being given an unfair advantage on the "B", because the two sets were so similar. Tr. 25,146-147 Collins). In order to provide at least some review of the "A" examination while it was being given, the Licensee provided three unlicensed persons to meet with the NRC examiner. These were Mr. Ronald J. Toole, Operations and Maintenance Director at TMI-1, Mr. Samuel L. Newton, Operator Training Manager at TMI, and Mr. Charles Pardi of ATTS, a consultant to the Licensee on training. Staff Ex. 27 at 14, 17, 18. They reviewed the questions and answer key to the "A" examination with Mr. Bruce Wilson, the NRC examiner, on April 21 and 22. *Id.* The review lasted about one and one half hours on each of those two days. Tr. 25,557 (B. Wilson).

140. After Mr. Ross had taken the "A" examination he became available to meet with the NRC examiner. On April 23, while the RO "B" examination was being given, he met with Mr. Bruce Wilson, the NRC examiner and proctor. They met in an office next to the examination room reserved for smokers. Mr. Nelson Brown and Mr. Dennis Boltz, who are instructors on the Licensee's training staff, were also present. According to Mr. Ross, the object of the meeting was to review the answer key to the "A" examination and the questions and answers to the RO "B" examination. Tr. 24,160 (Ross). Mr. Ross testified that the review lasted "approximately three to four hours." Ross, ff. Tr. 24,127 at 2-3. He stated that in his experience, the time required to review an examination was usually one and one half to two hours. Tr. 24,134 (Ross). He said that on April 23 the questions on the RO "B" examination were reviewed, and so was the answer key to the "A" examinations. Tr. 24,160 (Ross). The process of review consisted of having Messrs. Ross, Boltz and Brown inform Mr. Wilson of any disagreements which they had with a question or an answer, and of having them supply any documentation required to support their point of view. *Id.* Several changes to the answer keys resulted from this process; some of them are discussed below in ¶¶ 153-175. During the time when this review was taking place, Mr. Wilson was not proctoring the examination room. See ¶ 149, below.

141. On Friday, April 24, while the SRO "B" examination was underway, Mr. Ross met again with the same persons in the same room to continue the review. He testified that, to the best of his recollection, the reviewers first completed work on the RO "B" examination and then did the SRO "B" examination. Tr. 24,164; Tr. 24,167 (Ross). Mr. Ross said the review again took approximately three to four hours. Ross, ff. Tr.

24,127 at 2-3. This made Mr. Ross' estimate equal six to eight total hours for both days' review. Mr. Wilson then proctored for the one or two hours which remained. Tr. 25,559 (B. Wilson).

142. Mr. Ross' participation in this review became an issue when YY, a former employee at TMI-1, reported that Mr. Ross had bragged about keeping the NRC proctor out of the examination room. YY made this report to the NRC Staff's Office of Inspection and Enforcement (OIE). He said that on either April 23 or 24, during the 7 a.m. to 3 p.m. shift, Mr. Ross came into the shift supervisor's office in a "very happy — almost ecstatic — mood" Staff Ex. 27, Enclosure 1. According to YY, Mr. Ross

said that he had gotten the NRC to 'expand' the answer key so as to give the examiners more latitude in their answers and also that he had kept the proctor out of the room for a very long period of time. The inference . . . was that by both actions he had made it easier for the people taking the tests.

Id. The NRC investigator informed YY that it was a standard procedure to review examinations and answer keys, and asked YY whether Mr. Ross' "talk was just bragging — that is, if he was just trying to impress his subordinates . . ." *Id.* YY replied that he "felt Ross had meant what he said, and that by implication, he had kept the proctor out of the room to facilitate cheating." *Id.* YY added, however, that "it is possible that he could also have been bragging." *Id.* At my request, YY appeared to testify. He repeated on the witness stand his belief that Mr. Ross had meant that he (Mr. Ross) had kept the NRC proctor out of the examination room to facilitate cheating. Tr. 26,011; Tr. 26,015-016 (YY). YY said that he believed, based upon his experience at TMI-1, that Mr. Ross would do such a thing. Tr. 26,011 (YY).

143. There was also other evidence of Mr. Ross' comments. GG, a shift foreman at TMI-1, stated that during the examination period Mr. Ross participated in a conversation about changes in the answer keys, and that during that conversation Mr. Ross said, either to GG or to a group of which GG was a part, "don't worry, you did all right." Staff Ex. 27 at 26. GG said that he interpreted this to mean that the answer keys were broadened to make them more fair, rather than to give the candidates an unfair advantage. *Id.* KK, who also recalled Mr. Ross' conversation about broadening the answer keys, said he (KK) attached the same meaning to Mr. Ross' remarks as did GG. *Id.* at 24. RR, a shift technical advisor at TMI-1, stated that during the examination period or shortly thereafter, he was in either the control room or the shift supervisor's office when Mr. Ross came in at the time of the shift change; the operators were depressed and angry about the examination; in response to their complaints, and in reference to Mr. Ross' review of the examination, Mr. Ross said: "don't

worry about it, I took care of that job." Staff Ex. 27 at 27. According to RR, everyone then "chuckled." *Id.* RR added that this comment was one of Mr. Ross' "standard phrases." RR said that the "comment was made to cheer people up." *Id.*

144. Mr. Ross told the NRC investigators that he did not specifically remember the conversation described by YY, but he said that he might have mentioned how long the reviews had taken. He said he would have done this as an observation, rather than to describe an attempt to distract the proctor. Staff Ex. 27 at 12-13. He denied that he had attempted to prevent the NRC proctor from doing his job. *Id.* On the witness stand, Mr. Ross said that he remembered discussing the answer key, and discussing his review of the examination, but could not remember specifically when or with whom the discussion occurred. Tr. 24,176-177 (Ross). He asked whether he had made the remark "I took care of that job." He said that it was possible that he made it ("I feel I could have made the remark") (Tr. 24,180(Ross)) but he did not specifically recall it. *Id.* He was also asked whether he had said "don't worry you did all right." He replied "very probably," although again he said he did not specifically remember it. Tr. 24,331 (Ross). He said that if he had made the latter remark he would have intended it to indicate that the answer keys reflected what the operators had learned in training, rather than to indicate to GG personally that GG had done well. *Id.* With respect to the "chuckling," Mr. Ross said that there was an attempt at the time to increase morale, so the chuckling could have occurred. Tr. 24,334-335 (Ross).

145. Mr. Bruce Wilson, the NRC proctor who did the review with Mr. Ross, said he did not "gain the impression at the time that any of the three TMI reviewers were attempting to keep me out of the room." Staff Ex. 27, Enclosure 2 at 3. He said "I particularly felt that Mike Ross, whom I have dealt with for over seven years, would not have been a party to such an action." *Id.*, Enclosure 2 at 4. Mr. Wilson stated that it took about three hours to review the RO "B" examination, two to two and one half hours to review the SRO "B" examination, and about two and one half hours for each of the two "A" examinations. This is a total of ten to ten and one half hours. *Id.*, Enclosure 2 at 3. Mr. Wilson said that "[t]hese reviews took much longer than on the previous days because of their [the TMI reviewers'] greater technical competency which in turn allowed them to argue more forcibly and knowledgeable concerning the allocation of credit on answers." *Id.*

146. Mr. Ross was asked about the extent to which the questions and the answer keys were actually changed during the review. With respect to the RO "A" examination, Mr. Ross recalled that he had raised a question concerning Question B4. Tr. 24,266; Tr. 24,268 (Ross). He was asked whether he recalled other instances, and he said "I am sure we had some

discussions as we went through but I do not remember asking for changes on too many other items that I can remember." Tr. 24,277 (Ross). He said that Question B4 was the only one he could specifically recall, "keeping in mind it is more than a year since that happened." Tr. 24,278 (Ross). He was asked how long the review took, and he said "I think it was in the time frame of 1½ hours by the time you go through and look at the question and make sure it reads right." Tr. 24,277 (Ross). Mr. Ross stated that he did not know whether the NRC examiner actually accepted the changes to the answer keys which he and the other reviewers had suggested. Tr. 24,332 (Ross). He said he did not know at the time, and said "I still do not know today." *Id.*

147. The above testimony by Mr. Ross is not credible. First, Mr. Ross' statement that he did not know whether the answer key was actually changed is contradicted by the assurances he made to the operators. Even if those assurances are interpreted most favorably to Mr. Ross, they still amount to a statement that the key *had* been changed (see ¶ 143, above) and "was going to be fair" (Tr. 24,180 (Ross)). Mr. Dennis Boltz, one of the other TMI reviewers, said that as a result of the review, "several answers were modified." Staff Ex. 27 at 22. Mr. Nelson Brown, the other TMI reviewer, said that "based on the review there were some changes and/or clarifications made in the questions and/or answers by Bruce Wilson." *Id.* at 19. Mr. Wilson himself testified that the changes were in fact agreed upon during the review (Tr. 25,608 (B. Wilson)), that the changes were written in by longhand during the review (Tr. 25,597 (B. Wilson)) and that often the changes were written in by one of the reviewers from TMI (Tr. 25,608 (B. Wilson)). This is confirmed by the handwriting on the keys themselves. See ¶¶ 153-175 below. Mr. Ross was by far the most competent of the reviewers (see, e.g., Tr. 25,548 (B. Wilson)); the reviewers argued "forcibly" for changes (see ¶ 145, above); and the changes were extensive (see ¶¶ 153-175, below). Despite Mr. Ross' testimony to the contrary, Mr. Ross obviously knew that Mr. Wilson had adopted the changes during the review. Mr. Ross' testimony that he did "not remember asking for changes on too many other items" conflicts with the fact that extensive changes were requested and made (*id.*) and conflicts with the fact that one and one half hours were required to make the review. Mr. Ross said that this period of time was necessary to "look at the question and make sure it reads right," but the clarity of the questions was not reviewed during this period, only the answer key was. Tr. 25,498-499 (B. Wilson). Mr. Ross' inability to recall the changes cannot be explained by the lapse of "more than a year since . . . [the review] happened," because the review took place on April 23, 1981 and Mr. Ross testified on November 14, 1981. Mr. Ross' estimate of six to eight total hours for both days' review (see ¶ 141, above) misstates the length of the

review and its effect on proctoring. Mr. Ross' estimate was contradicted by Bruce Wilson (ten to ten and one half hours (see ¶ 145, above)) by Nelson Brown (approximately eleven hours (Staff Ex. 27 at 19)) and by Dennis Boltz (approximately eleven hours (*Id.* at 22)). Mr. Ross' lack of credibility here is important in evaluating his response to YY's allegations.

148. The evidence clearly shows that Mr. Ross discussed his review of the examination in the control room or the shift supervisor's office at the time YY alleges that he did. The two remarks "don't worry, you did all right," and "I took care of that job" were no doubt made. "Chuckling" no doubt followed the second. There is no reason to question the testimony of the operators on these points. Moreover, Mr. Ross does not deny making these remarks. With respect to the first remark, the operators' interpretation is entirely plausible; however, one must remember that the operators are Mr. Ross' subordinates, and that a person who testifies to an event has a tendency to interpret it according to his own interest. The second remark, even if designed to increase morale, is quite different from the first. It states that there was a "job" to be "taken care of," and that Mr. Ross "took care" of it. The implication is that the "job" was to broaden the answer key to help the operators pass the examination, and that Mr. Ross "took care" of the job by pursuing that purpose. The "chuckling" of the operators shows that they so interpreted the remark.

149. The extensive reviews on April 23 and 24 caused one of the two examination rooms to remain without a proctor for most of those two days. Tr. 25,556-559 (B. Wilson). Mr. Boltz's office, where the review was conducted, is immediately adjacent to the room left unproctored; the doors of both rooms were partially open during the examination (Tr. 25,514-515 (B. Wilson)); from Mr. Boltz's office one could see into the unproctored room but not far enough to observe cheating (see, Diagram of Training Facility, ff. Tr. 24,152); (Tr. 25,504 (B. Wilson)); or hear whispering (*id.*); the reviewers spoke aloud, but softly because of the open doors (Tr. 25,514 (B. Wilson)). Mr. Wilson visited the examination room on these two days, but only for "several minutes at a time." Tr. 25,501 (B. Wilson). Under these circumstances, Mr. Ross obviously knew that one of the two examination rooms was not being proctored during most of the time the examination was given. His testimony to the contrary (Tr. 24,342-343 (Ross)) is not credible.

150. The question of Mr. Ross' motive depends, ultimately, on credibility. Mr. Ross' testimony must be weighed against that of YY. Mr. Wilson's statement, that Mr. Ross' motive was benign, must be viewed in light of Mr. Wilson's interest in making such a statement. Mr. Wilson was kept away from the examination room for a long time. For Mr. Wilson to say that he was kept away because of Mr. Ross' improper motive would

require Mr. Wilson to admit that he was tricked into not doing his job. As stated above, a person who testifies to an event tends to interpret it according to his own interest.

151. YY's testimony was clear. He said that Mr. Ross made the statement about keeping the proctor out of the room. He also said that when Mr. Ross made that statement, Mr. Ross was "almost ecstatic," and that Mr. Ross clearly meant that the proctor was kept out in order to help the candidates. YY affirmed his position in the face of questions. Mr. Ross' remark that "I took care of that job," which Mr. Ross clearly made, gives the same impression as the impression which YY says Mr. Ross gave about keeping the proctor away. YY had absolutely no reason to misrepresent what he heard. Mr. Ross has a clear interest in denying an improper motive. Mr. Ross' credibility was undermined by his untrue statement that he did not know whether the answer key had been changed. It was also undermined by his untrue statement that he did not know whether the adjoining room was proctored. When he said that the review of the "A" examination took longer because of the need to review the questions for clarity, when he said that the review had taken place more than a year before, and when he said that the total time for all review was only six to eight hours, he was wrong. Each of these wrong answers by Mr. Ross tended to slant the facts in a direction more favorable to himself. I observed the demeanor of both Mr. Ross and YY. YY's demeanor was completely forthright; Mr. Ross' was less than forthright. In my judgment, the weight of the evidence establishes that Mr. Ross said that he kept the proctor out of the examination room, and it establishes that when he made that statement he meant that he had done so in order to help the candidates pass the examination.

152. What are the consequences of this finding? Can the statement be dismissed simply as an improvident gesture, designed to build morale, in which Mr. Ross only pretended to have had an improper motive? That does not seem likely. The absence of a proctor was *not* a benefit to the candidates in the smokers' room. P, who was one of those candidates, was angry about the absence of the proctor. Staff Ex. 27 at 40. He said it "put him in the uncomfortable position where he could be solicited by other examinees." *Id.* The preponderance of the evidence is that he *was* solicited. See ¶¶ 101-111, above. P also "resented having to leave the room to seek clarification of a question . . ." *Id.* It is difficult to see how Mr. Ross could believe that honest operators would welcome the absence of a proctor. The conclusion here must be that Mr. Ross intentionally kept the proctor away in order to aid the candidates.

Broadening the answer keys

153. It was also alleged that Mr. Ross improperly caused the answer key to the NRC examination to be broadened, so that it would be easier for the candidates to pass. As pointed out above, Messrs. Ross, Boltz and Brown reviewed the answer keys to their own examinations. This occurred because there were no persons, other than those who were taking the examination, sufficiently familiar with the reactor to review the examination with the NRC examiner. See ¶¶ 137-139, above. Of course, this opportunity for review meant that Messrs. Ross, Boltz and Brown could influence their own grades. As will appear below, they in fact did so. The review sessions were extensive; they consumed about ten and one half to eleven hours during the last two days of the examination. See ¶ 147, above. Changes to the answer key were written in by hand, during the review, with the agreement of the TMI reviewers. Tr. 25,608 (B. Wilson). Almost all of the changes made were suggested by the reviewers; however, the reviewers also suggested changes which the NRC examiner did not accept. See ¶ 161, below. On some questions, the answer key had been left blank, and the answers were filled in during the review. See ¶ 172, below. In order to determine whether the changes to the key were proper, one must consider them one at a time. In the discussion below, only twelve changes in the key of the "A" examination are considered. There were many more changes than just these twelve. Changes in the key for the "B" set of examinations were not considered at all. These twelve changes are presented simply as examples.

154. The first change examined was on Question B.5.a. The question concerned reactor coolant pumps. It asked: "What is the purpose of the No. 1 seal by-pass line? Include how opening this line affects the No. 1 seal." Staff Ex. 33. The answer key, as originally prepared by the NRC examiner, Mr. Wilson, stated:

Lowers the pressure in the No. 1 seal area, offers lower head resistance to pump injection water, allows more injection flow to be diverted up shaft through the seal and past radial bearing. This prevents binding and contact of seal faces.

Id. After Mr. Wilson discussed the answer with the TMI reviewers, the key was changed to read as follows:

Lowers the pressure in the No. 1 seal area, offers lower head resistance to pump injection water, allows more injection flow to be diverted up shaft past radial bearing for adequate cooling.

Id. The result of this change was to make the answer key state a different effect from opening the by-pass line. The original answer said the effect was to prevent the seal faces from binding; the changed answer said the effect was to cool the radial bearing.

155. Mr. Wilson was asked to explain the change. He said that the change was made during the review, and at the suggestion of the Licensee's reviewers. Tr. 25,597-598 (B. Wilson). He said that the change was made because at TMI-1 the operators had been taught that the purpose of the by-pass line was to allow flow in order to cool the radial bearing when the reactor coolant system is at low pressure. Tr. 25,598 (B. Wilson). He said that at other facilities, operators were taught that this flow accomplished two purposes: to cool the radial bearing, and to prevent binding and contact of the seal faces. *Id.* Because the TMI operators were taught that the purpose was simply to cool the bearing, the sentence about preventing contact of the seal faces was deleted. Tr. 25,599 (B. Wilson). The answer key as changed matched the answers given by Messrs. Ross, Boltz, and Brown. Staff Ex. 35, 37D, 37M. They also matched the answers of B, X, RR, F, G, and FF. Staff Ex. 37Q, 37A, 37P, 37J, 37H, 37F. However, eight other candidates *included* in their answers the statement: "This prevents binding and contact of seal faces." These candidates were T, E, UU, QQ, D, SS, U, and H. Staff Ex. 37R, 37E, 37L, 37O, 37K, 37N, 37B, 37I. These eight candidates must have received their information from the TMI-1 training program. Thus, it appears that the candidates at TMI-1 *were* taught that the effect of opening the by-pass line was to prevent the seal faces from binding. The candidates must have been taught both effects, since about one half answered one way and about one half answered the other way. The eight candidates who included the statement about the seal faces were marked right, and so were the candidates who only mentioned the radial bearing. Staff Ex. 35, 37A-37R. The effect of the change was to cause persons who mentioned only the bearing to receive the same credit as persons who mentioned the seal faces. The TMI reviewers achieved this result by telling Mr. Wilson that the TMI candidates had only been instructed on the bearing, and by getting Mr. Wilson to delete the effect on the seal faces from the answer key.

156. This change in the answer key cannot be reconciled with the question. The question, which was clear and straightforward, consisted of two parts. First, the question asked the candidates to state "the purpose of the No. 1 seal by-pass line." One purpose of the by-pass line (according to Mr. Wilson) was to cool the radial bearing. Thus, an answer mentioning cooling would respond to the first part of the question. The second part of the question asked the candidates to "include how opening this line affects the No. 1 seal." An answer to the second part of the question would necessarily mention an effect on the *seal*, since that is what the question asked. According to Mr. Wilson, the effect of the by-pass line on the *seal* was to "prevent binding and contact of the seal faces." It is obvious that an answer which describes the effect on the *bearing*, which may be a response to the first part of the question, is *not* an answer which describes

an effect on the *seal*, which is asked for by the second part of the question. In effect, an answer describing only the effect on the bearing is half the answer, since it responds to half the question.

157. Mr. Wilson said he agreed to the change because of the candidates' training program which taught only the effect on the bearing. This reasoning cannot be accepted. If the by-pass line has both effects, as Mr. Wilson stated, and if the effect on the seal was important enough to justify a specific question about it, then a candidate who did not know that effect should have been marked wrong, regardless of the training program. The NRC examination is designed to test the Licensee's training program as well as the Licensee's candidates. According to the NRC Staff, its examination is the *only* test of the Licensee's training program. Boger, ff. Tr. 25,480 at 2-4. If the training program was deficient, the grading should have reflected it. If the NRC examination and its answer key are changed to cover only what candidates actually learn in their training programs, there is little purpose in giving the NRC examination. At TMI-1, however, the effect on the seal *was* covered in the training program. There is no other plausible source for the answers given by half of the candidates. They answered the second part of the question by describing the effect of the by-pass line on the seal faces.

158. The answer key should not have been changed. By changing it the candidates who only responded to the first part of the question received the same credit as was given to the candidates who responded to both parts of the question. The reviewers—and the candidates answering similarly to the reviewers—were the only beneficiaries of this change. The effect of the change was to broaden the answer key improperly.

159. The second change examined was on Question B.5.c. This question asked: "When must a reactor coolant pump be tripped due to high vibration? (assume 4 pump operation)." Staff Ex. 33. The answer key, as originally prepared by Mr. Wilson, stated "20 mils — 4 pump operations; 30 mils single pump operations." *Id.* At the suggestion of the TMI-1 reviewers, the key was changed during the review to add an additional condition for tripping the pump. The additional condition was "motor stand high vibration 2 mils." *Id.*; Tr. 25,603 (B. Wilson). Mr. Wilson testified that the reason for the change was that the motor stand vibration was in fact a condition for tripping the pump, that the reviewers anticipated that the TMI candidates would give that answer, and that the reviewers did not want the candidates to be marked wrong because the motor stand vibration was not on the answer key. Tr. 25,604-606 (B. Wilson). Almost all the candidates, including the reviewers, included the motor stand vibration in their answers. Staff Ex. 35, 36, 37A-37R. This change was proper, and its effect was to make the answer key more complete.

160. The third change examined was on Question B.6.a. The question asked: "How does the response of the NSRW [nuclear services river water] system differ between a loss of offsite power with and without a LOCA?" Staff Ex. 33. The answer key, as originally prepared by Mr. Wilson, stated: "NSRW pumps don't auto start unless there is a LOCA (ES) signal in which case they are block loaded." The key was changed at the suggestion of the TMI reviewers to read: "LOOP [loss of offsite power] w/LOCA: 2 ES [emergency safeguard] selected pumps start - (standby not selected for ES locked out); LOOP w/o LOCA: standby pump starts." *Id.* The effect of this change was to rewrite the NRC answer. Tr. 25,606-607 (B. Wilson). The original NRC answer was based upon information in the Licensee's Operator Accelerated Retraining Program (OARP), which the Licensee had supplied to the NRC examiners. Tr. 25,607 (B. Wilson). However, the information in the OARP conflicted with a blackout procedure at TMI-1 under which the standby pump starts. Tr. 25,608 (B. Wilson). The NRC had also been given the blackout procedure, but the NRC did not compare it to the OARP material when the NRC prepared the answer key. *Id.* The result was that the answer key was incorrect as originally written. *Id.* The answer key was changed during the review (*id.*), and as changed it matched the answers given by the TMI reviewers and most of the other candidates. Staff Ex. 35, 37A-37R. The change in the key was proper, and was required because the NRC was unaware of current facts specific to the site.

161. The fourth change examined was on Question C.2.b. The question asked:

Control of pH is important to minimize corrosion of primary and secondary components. Primary pH can vary from 4.6 to 8.5. Describe the competing effects that determine primary pH and cause it to vary in this manner.

Staff Ex. 33. The answer key prepared by the NRC examiner read:

Boric acid and lithium hydroxide concentrations compete. Boric acid concentration varies over core life for reactivity control. Boric acid causes pH to be lowered. LiOH is alkaline and causes pH to be increased. Decrease in boric acid over core life is dominant factor.

Id. This answer was not changed despite arguments made by the TMI reviewers. Tr. 25,611 (B. Wilson). The NRC examiner had based the original answer key on material from the chemistry lecture in the Licensee's OARP program. *Id.* According to Mr. Wilson, the TMI reviewers said that the OARP material was "written [for TMI] by outside consultants and it was not . . . the way they operated the power plant." *Id.* The reviewers argued that the key should be changed to show the manner of controlling the concentration of lithium hydroxide. Tr. 25,613. Their ar-

gument was summarized in handwritten notes in the margin of the answer key. The first note said: ".2-2 ppm with lithium control; lithiated demineralizer bed." Staff Ex. 33. The second note said: "For good answers see Zewe and Boltz." *Id.*

162. Mr. Ross' answer to this question matched the handwritten notes in the margin of the answer key. His answer stated that the concentration of lithium hydroxide was controlled between .2 and 2 ppm by using a demineralizer. However, his answer did not mention boric acid. Staff Ex. 35. The answer was marked wrong for leaving out boric acid, but was given half credit for discussing lithium hydroxide. *Id.* Mr. Boltz, one of the two other reviewers, gave an answer similar to Mr. Ross'. Staff Ex. 37D. Mr. Brown, the third reviewer, gave a wrong answer. Staff Ex. 37M. Of the other candidates, only B, F, and U gave answers similar to those of Messrs. Ross and Boltz. Staff Ex. 37Q, 37J, 37B. However, answers similar to the NRC answer key were given by X, T, E, UU, D, SS, and V. Staff Ex. 37A, 37R, 37E, 37L, 37K, 37N, 37G. Apparently, these candidates based their answers on the chemistry lecture in the OARP program. Wrong answers were given by RR, GG, QQ, G, FF, and H. Staff Ex. 37P, 37C, 37O, 37H, 37F, 37I. Thus, few other candidates agreed with the theory of plant operation advanced by Messrs. Ross and Boltz. The most frequently-given answer, in fact, matched the original NRC answer key. Mr. Wilson testified that the change noted in the margin was added simply to reflect the particular method for operationally controlling lithium hydroxide; he said the method was "pretty much standard for most B & W facilities, to control it between .2 and 2 ppm." Tr. 25,613 (B. Wilson).

163. From the above, it appears that Mr. Wilson did not accept the reviewers' argument as valid. Mr. Wilson apparently believed that the method for controlling the lithium hydroxide concentration was conventional and not important; he believed the important relation, and the goal of the question, was the relation between boric acid and lithium hydroxide over the life of the core. Most of the candidates agreed with Mr. Wilson. The reviewers' statement that the NRC's answer "was not the way they operated the power plant" has little support beyond the answers of the reviewers themselves. If Mr. Wilson and the majority of the candidates were right, as they appear to have been, then the reviewers' argument was an attempt to make the answer key less, rather than more, correct.

164. To evaluate the reviewers' position on this question one must keep in mind what the question specifically asked. The question did not ask how lithium hydroxide is controlled. It did not ask how pH was controlled. The question asked the candidates to state the "competing effects that determine primary pH." There are only two of these "competing effects," and both must be present in order for them to compete. One of them is lithium

hydroxide and the other is boric acid. An answer limited to lithium hydroxide, whether including the method of controlling it or not, is not an answer which responds to the question.

165. It is difficult to imagine how the NRC examiner could have accepted the reviewers' change and still have graded the question. If the answer key had been rewritten to give full credit to a description of lithium hydroxide alone, the key would have stated one "competing effect" without stating the other, which makes no sense. The reviewers' statement that "it was not . . . the way they operated the power plant" was really irrelevant to the question, which was not concerned with controlling either of the effects.

166. Only if the reviewers totally misunderstood the question could they believe their answer should be substituted. Once Mr. Wilson pointed out the meaning of the question, as he must have done during the review, it is difficult to see how the reviewers could have persisted in good faith. Most of the other candidates did *not* misinterpret the question; they answered it correctly on the examination. If the reviewers' change had been adopted, the key would have given the same credit to candidates who mentioned lithium hydroxide alone (one competing effect) as was given to candidates who mentioned lithium hydroxide and boric acid (the two competing effects). Only Messrs. Ross and Boltz—and the few other candidates answering similarly to them—would have been aided by such a change. The conclusion is that Messrs. Ross and Boltz made an improper attempt to broaden the answer key.

167. The fifth change examined was in Question D.5. The question asked:

Sensors to start or initiate emergency, safeguard, or control system action come from a variety of different sources. List the sensors that will initiate an automatic action for the following abnormal situations (for example, high flux as sensed by the linear power range detectors causes the RPS to trip the control rods).

- a. Auto initiation of EFW due to loss of main feedwater.
- b. Main steam line isolation.
- c. Main transformer fire deluge.
- d. ICS tracking signal.

Staff Ex. 33. The answer key, as originally prepared by the NRC examiner, read:

- a. 200 psi delta p
- b. 500 psi
- c. (blank)
- d. Mwgen

Id. During the review with the TMI reviewers, Mr. Wilson changed these answers to read:

- a. Low 50 lb delta p across feed pumps
- b. 600 psi
- c. Temp sensors - electrical protection manual
- d. Question was too vaguely worded - will accept those signal[s] that put ICS in track.

Id.; Tr. 25,614-618 (B. Wilson). These changes were written in by hand during the review. Tr. 25,614 (B. Wilson).

168. Mr. Wilson changed the answer to part "a" from "200 psi delta p" to "Low 50 lb. delta p across feed pumps" because the original answer of 200 was incorrect. Tr. 25,614-615 (B. Wilson). Mr. Wilson had based his original answer upon the OARP program, and upon information supplied to the NRC which showed that a design change using the 200 figure would be in place at the time of restart. Mr. Wilson learned during the review that the design change had not been made, so he changed the answer key. Tr. 25,615 (B. Wilson). On part "b", Mr. Wilson changed the answer key because "500 psi" was incorrect. Mr. Wilson said the figure of 500 came from erroneous information possessed by NRC, or from the false assumption that TMI-1 was the same as other Babcox and Wilcox facilities, in particular TMI-2, or from a typographical error. Tr. 25,616 (B. Wilson). On part "c", Mr. Wilson had left the original answer key blank. He did so because at the time he asked the question he could not find a source of reference material which contained an answer specific to TMI-1. He filed in the answer during the review (Tr. 25,617 (B. Wilson)) and undoubtedly relied upon the reviewers to supply it. On part "d", Mr. Wilson's original answer of "megawatts generated" was correct. However, he stated that the candidates at several facilities, including TMI, had systematically misinterpreted the question as seeking an answer different from that which Mr. Wilson anticipated. Tr. 25,618 (B. Wilson). Mr. Wilson changed the answer key so as to grade the candidates' answers in accordance with the candidates' interpretation. *Id.* Practically all the candidates, including the reviewers, gave the changed answers. The NRC examiner depended entirely upon the reviewers for all the answers to this question.

169. The sixth change examined was to Question E.3. The question reads as follows:

With respect to a major steam line break inside the reactor building.

- a. identify the main and backup signals that could cause the reactor to trip. Include setpoints and coincidences.
- b. One of the concerns with this incident is the restart of the reactor. Explain how a result could occur and how automatic actions would prevent a restart.

Staff Ex. 33. The answer key, as originally prepared by the NRC examiner, stated:

- a. 1. High Flux at (blank)
2. Low Pressure at (blank)
3. (blank)
4. (blank)

Coincidence — any two of these signals on different channels will cause a Rx trip — including same signal on two channels or different signal on 2 channels.

- b. Cooldown will lead to [increase in reactivity] with a negative MTC — automatic actions include Rx trip — rods insert [decrease in reactivity], ES actuation [decrease in reactivity] from boron.

Id. In part “a”, Mr. Wilson filled in “104.75 to 105.5” in subpart “1”; he filled in “1900” in subpart “2”; he filled in “Hi reactor building pressure at 4 psig” in subpart “4”; and he deleted subpart “3”. *Id.* Mr. Wilson testified that he did not have the set points for these answers when he prepared the questions, so he added them during the review. Tr. 25,619 (B. Wilson). He said it was a common practice to wait until the review to fill in set points because they can change widely during a short period of time. Tr. 25,620 (B. Wilson). In part “b” of this question, Mr. Wilson changed the answer key to indicate that the answer should assume that the reactor was tripped and to add that feedwater isolation occurs at 600 psi. Staff Ex. 33. The answers to parts “a” and “b”, as filled in and changed, matched the answers given by Messrs. Ross and Boltz and by candidates X, RR, E, V, and FF. Staff Ex. 35, 37D, 37A, 37P, 37E, 37G, 37F. Mr. Brown and B, T, GG, UU, QQ, D, SS, G, U, and H gave wrong answers. Staff Ex. 37M, 37Q, 37R, 37C, 37L, 37O, 37K, 37N, 37H, 37B, 37I. It is clear that the NRC examiner depended upon the reviewers for the answers to this question. Since so many other candidates missed this question, one wonders whether the information supplied by the reviewers was correct. If it was not, and if Mr. Wilson could not or did not verify it, there may have been unfairness to the other candidates.

170. The seventh change examined was on Question E.4. That question asked the candidates to “describe the two methods which are used to detect a leak in the RB emergency cooling system.” Staff Ex. 33. The answer key, as originally prepared by the NRC examiner, stated the two methods as follows:

- a. While system is shutdown, a rotometer located on the supply line is monitored locally.
- b. While operating, a differential between inlet flow and outlet flow (temperature compensated) will alarm in the control room.

Id. Mr. Wilson changed the answer key during the review by adding a third method suggested by the reviewers. It stated: "Drip pan alarm — 0.3 gpm." *Id.*; Tr. 25,620-622 (B. Wilson). The effect of the change was to allow a candidate who listed any two of the three methods to receive full credit on the question. The reviewers and almost all the other candidates gave answers which matched the change. Staff Ex. 35, 37A-37R. The change appears to be necessary and correct; without it the NRC answer would have been incomplete. This is yet another example of the reliance which NRC must place on the Licensee's reviewers.

171. The eighth change examined was on Question F.2.a. The question asked the candidates to "list the six logs and/or records that must be reviewed by the oncoming CRO." Staff Ex. 33. The answer key, as originally prepared by the NRC reviewer, stated:

1. Hourly log
2. CR log
3. Shift Foreman log
4. Check Lists
5. Recorder charts
6. Computer printouts

Id. The answer key was changed during the review to read as follows:

1. Control Room log
2. TCN + SOP
3. Ops. Memo Book
4. Revision Review Book
5. Active Tagging Appl.
6. Locked valve [list]
7. Outstanding Surveillance schedule

Id. Mr. Wilson testified that he prepared the original NRC answer from an administrative procedure furnished by the Licensee; in a section on definitions, the procedure contained the six logs which Mr. Wilson used. Tr. 25,623-624 (B. Wilson). During the review, however, the TMI reviewers pointed to a later section of the same procedure, which specifically listed the logs which operators must review when assuming a shift. *Id.* The latter section contained a different list of logs, so Mr. Wilson changed the answer key to match this latter list. Tr. 25,625 (B. Wilson). The reviewers and practically all of the other candidates gave the changed answer. Staff Ex. 35, 37A-37R. The change appeared to be necessary in order to match the applicable procedure and to overcome the inadequacy of the NRC answer. This inadequacy in the NRC answer was caused either by an ambiguity in the procedure or by a misinterpretation of the procedure by the NRC examiner.

172. The ninth change examined was on Question F.5.c. The question asked: "Under what conditions may HPI be throttled after ESAS initiation during a LOCA?" Staff Ex. 33. The answer key, as originally prepared by the NRC examiner, left the answer blank. *Id.* During the review the following answer was written in:

1. LPI flow stable at > 1000 gpm for 20 min.
2. 50° subcooled & action is necessary to prevent pressurizer from going off scale high
3. To prevent pump run out, throttle to 550 gpm
4. To prevent violation of Rx vessel brittle fracture limit

Id. Apparently, the NRC examiner did not have the proper procedure available when he prepared the examination. He relied upon the Licensee to provide the most current version of the procedure. This is another indication of the extent to which NRC examiners rely upon the Licensee for answers to questions. The reviewers and the other candidates answered according to the filled-in answers. Staff Ex. 35; 37A-37R.

173. The tenth change examined was on Question G.4. The question asked the candidates to "give the nuclear process for the formation of . . . [Cobalt-60] and [state] why it is considered to be a hazard." Staff Ex. 33. The answer key, as originally prepared by the NRC examiner, stated:

Co60 primarily from Co59 + .n, where Co59 is found in the steel and other materials in the system. The hazard is that it has a 5 yr. half life thus takes a long time to decay.

Id. During the review Mr. Wilson changed the answer key to add, at the end of the answer, the clause: "and emits high energy gammas (2)." *Id.*; Tr. 25,626-627 (B. Wilson). Mr. Wilson testified that he changed the answer (which he had not personally prepared) in order to make it more complete; he said the hazard of Co60 arises from the gamma radiation which it emits, and so the answer should have included that radiation. Tr. 25,626-627 (B. Wilson). The change makes the answer complete and accurate. It is unknown why the original NRC answer was not complete. All the reviewers and all the other candidates included the gamma radiation in their answers. Staff Ex. 35, 37A-37R.

174. The eleventh change examined was on Question H.5.c. The question stated: "It is desired to increase the discharge head of a pump from 1200 psi to 1800 psi. How much does the speed of the pump have to increase?" Staff Ex. 33. The answer key, as originally prepared by the NRC examiner, stated: "Discharge head is proportional to the square of the speed. Need 4 times the speed to double the head. Thus $(1.5)^2 = \text{speed of pump} = 2.25$." *Id.* Mr. Wilson testified that the original answer was simply an error which he had made. Tr. 25,628 (B. Wilson). He stated that he believed that it was corrected before the meeting with the TMI reviewers. Tr. 25,629 (B. Wilson). The correction consisted of changing the

relation between the speed and the head from the square, as originally indicated, to the square root, which was written into the answer key by hand. Staff Ex. 33. All the reviewers and most of the other candidates gave the changed answer. Staff Ex. 35, 37A-37R.

175. The twelfth change examined was on Question N.5.a. The question asked: "List the design flow capacity of the HPI pumps." Staff Ex. 34. The answer key, as originally prepared by the NRC examiner, stated: "Module 6 GPU letter dated 1/3/80; 300 gpm at 1800 psig." *Id.* This answer was changed to "500 gpm at 600 psig" by a handwritten entry on the answer key. *Id.*; Tr. 25,629-630 (B. Wilson). Mr. Wilson testified that the original answer was based on a letter supplied by the Licensee on January 3, 1980. Tr. 25,629-630 (B. Wilson). The letter gave the flow capacity of the pumps as 300 gpm at 1800 psig. *Id.* The TMI training department, however, had informed the candidates that the design flow was 500 gpm at 600 psig. *Id.* It appears that the discrepancy here was caused by inaccuracy in the information supplied to the NRC by the Licensee. All the reviewers and candidates except one gave the changed answer. Staff Ex. 36, 37A-37R.

176. These twelve changes are examples; they are about one-fourth of the total number. If the twelve are typical, and they probably are, then the NRC examiner depends heavily upon the Licensee for answers to examination questions. This dependence is discussed further below in ¶ 276.

177. The good faith of the reviewers is at issue on Questions B.5.a. and C.2.b. On Question B.5.a., the answer key was changed so as to give full credit to candidates who answered only half the question asked. The change was made because the reviewers told Mr. Wilson that the seal faces were not covered in the TMI-1 training program. The seal faces *were* covered in the training program, and the change was *not* reconcilable with the question asked. There was no ground upon which the change could have been rationally defended, and the ground actually given by the reviewers misrepresented the training program. Question C.2.b. asked the candidates to list the competing factors which determine pH in the primary cooling system. The reviewers tried to change the answer so as to give full credit to candidates who listed only one of the two factors which compete. The reviewers' statement that "it was not . . . the way they operated the power plant" was irrelevant to the question asked, and was not shared by the majority of the candidates, who gave the right answer to the question. On both of these questions, the change would have (or did) increase the reviewers' score. On Question C.2.b., the reviewers were virtually the only candidates who stood to gain from the change.

178. The most important piece of direct evidence on the reviewers' motive came from Mr. Ross. During the days when the review took place he discussed it in the control room with some of the candidates. In

reference to the review he said: "I took care of that job." See ¶¶ 143-144, above. The candidates then "chuckled." *Id.* The motive which Mr. Ross displayed to the candidates on this occasion, if one can judge from the reaction it produced, was not that of an impartial reviewer. The testimony of YY, GG, and KK on broadening the answer key is described in ¶¶ 142-143, above. Because of the lack of any rational ground for the changes, the advantage of the changes to the reviewers' grades, the inadequacy of the reviewers' reasons for the changes, and the remark by Mr. Ross, I must find that the reviewers did not act in good faith. Since the reviewers acted jointly, and since Mr. Ross was the senior (and most competent) reviewer, the conclusion is that Mr. Ross improperly caused the answer keys to be broadened.

Radiation work permits: Harry E. Williams, Jr.

179. The Aamodts tendered the testimony of Mr. Harry E. Williams, Jr. Tr. 24,984 (Clewett). Mr. Williams had been a security guard at TMI from about January or February of 1979 to May, 1979. Tr. 25,002 (Williams). He alleged, in written testimony, that he had observed cheating in a test for a Radiation Work Permit at TMI in late April, 1979. Aamodt Ex. 11 at 2-3. He said construction workers employed by Catalytic, Inc. used crib sheets, which they turned in to their foreman as they left the examination room. *Id.* The foreman then gave the crib sheets to the next group of workers as those workers arrived to take the same test. *Id.* He also alleged that he had received a Radiation Work Permit without completing two of the four requirements for the Permit; the two uncompleted requirements were a whole-body count, and instruction on the use of a gas mask. *Id.* at 3-4.

180. The Licensee conducted *voir dire* examination of Mr. Williams. The Licensee established that Mr. Williams made material false statements on two applications for employment with Gregg Security. Lic. Ex. 74, 75; Tr. 24,989, 991-994. Mr. Williams also admitted that he took home, without permission, documents from the office of John Herbein, who was then vice-president of Metropolitan Edison Company. Tr. 25,021-025 (Williams). When I asked Mr. Williams about the circumstances of his taking these documents, he gave a series of responses which were entirely incredible. Tr. 25,025-029 (Williams). The Commonwealth then inquired whether the Aamodts could offer even one piece of evidence to corroborate Mr. Williams' allegations about the cheating. Tr. 25,030 (Adler). The Aamodts were unable to do so. Tr. 25,030-031 (Clewett). The Commonwealth then joined the Licensee and Staff in objecting to the testimony.

Tr. 25,031 (Clewett). I ruled that the testimony would be excluded, in view of the fact that the testimony was of little probative value (the alleged cheating occurred just after the accident at TMI-2; no TMI personnel were alleged to have been involved) and in view of my complete lack of confidence in the truthfulness of the witness. Tr. 25,031-032 (Milhollin). This was the only evidence tendered on issue 6 (quoted in ¶ 3, above) so that issue is resolved in favor of the Licensee.

The definition of "management"

181. Who should be considered "management" for the purpose of determining management's involvement in cheating? Two definitions appeared at the hearing. Mr. Arnold said that common usage at TMI considered management to include "exempt [non-union] employees." Tr. 23,622-623 (Arnold). This definition would include all supervisory employees and other senior professional employees. *Id.* Mr. Ward testified that the NRC Staff regarded as management only those persons who controlled the actions of more than one shift. Tr. 25,377 (Ward). Mr. Arnold's definition would include the position of shift foreman and above; Mr. Ward's would include the position of manager of operations and above. Neither definition is inherently more logical than the other. There is little value in choosing between them unless the choice can be related to cheating.

182. A more fruitful approach is to consider the importance and function of the persons who cheated. O, W, U, Mr. Husted and Mr. Shipman cheated on the NRC examination. VV and O cheated in the incident in 1979. O and W were shift supervisors. They had supervisory authority over the personnel on their shifts and would normally have control of the reactor on the evening and night shifts. U was a shift foreman, who had supervisory authority over the control room operators and auxiliary operators on his shift. Mr. Husted was a training instructor, who was responsible for administering his portion of the training program and for helping to prevent cheating in that program. Mr. Shipman was senior operations engineer; he acted as Mr. Ross' "right hand man in the control room." P did not cheat on the NRC examination, but he gave untruthful testimony at the hearing. P was a shift supervisor with responsibilities similar to O's and W's. G, H, GG, and W cooperated on the weekly quizzes. G and H were control room operators with no supervisory responsibility. GG was a shift foreman with responsibility similar to U's. VV was supervisor of operations and clearly part of management.

183. From the above, it appears that the cheating on the NRC examination did not occur in the lower ranks of the operations staff. It occurred

in the middle and upper ranks. The senior operations engineer, the two shift supervisors, and the shift foreman came from those ranks. VV, of course, occupied the highest rank on the operations staff. Shift supervisors and shift foremen have important responsibilities for safety and for supervision. They function as managers while on duty, and their authority is important. Mr. Shipman, the senior operations engineer, has important managerial functions and regards himself as part of management. Therefore, with respect to the operations staff, one must conclude that the cheating involved the "management" of that staff. Of course, cheating by the operations staff—whether by its management or not—is not cheating by the upper management of GPU Nuclear Corporation. Ultimately, the question whether management was involved in cheating depends upon which management one is talking about. If one refers only to the operations staff, it is clear that its management was involved in cheating; if one refers to the upper management of the Licensee, then that management was not involved in cheating. Mr. Ross and VV functioned as the link between upper management and the operations staff.

C. THE LICENSEE'S RESPONSE TO THE CHEATING

184. The Licensee's management responded to three different types of cheating. First, the cheating on the NRC examination in April of 1981; second, the cheating on the weekly quizzes; third, the cheating by VV and O in 1979. The response varied according to the type of cheating. With respect to the NRC examination, the Licensee had to respond to the cheating by O and W, to Mr. Shipman's remark at the coffee machine, to U's presence in Mr. Husted's office, to the rumors about U and to the telephone call to KK. With respect to cheating on the weekly quizzes, the Licensee investigated the similarities among the answers given to those quizzes by all the operators who took them. The Licensee's response to VV's conduct in 1979 had already occurred before the hearing began, but it became an issue nevertheless. The first question was whether the Licensee had hindered the NRC's investigation of cheating on the NRC examination.

Management constraint on the NRC investigation

185. When the NRC Staff learned of the similarity between the answers of O and W, the Staff decided to interview O and W. The Licensee refused to allow the interviews to take place, however, unless a member of

management could sit in at the request of the interviewee. Arnold, ff. Tr. 23,590 at 5; Tr. 23,655 (Arnold); Tr. 25,428-429 (Ward). This led to a conversation between Mr. Hukill and Mr. Baci, the NRC investigator, in which Mr. Baci resisted the Licensee's position. Tr. 23,995-996 (Hukill); Tr. 25,433 (Baci). Mr. Baci presented his reasons on the witness stand. He said:

We felt that whenever you have an interview of a subject or an individual and you have his boss there, it is an inhibiting factor, in our experience. Also, when you have a large group setting it makes it a little bit more difficult to conduct an interview. And the other reason is that if an individual felt that he had some information which he wanted to provide to us in confidence, say he was providing information on a fellow employee, he might not want his boss to know that he was providing that information.

Tr. 25,433 (Baci). Mr. Baci said that he communicated these reasons to Mr. Hukill (*id.*) but Mr. Hukill said that he did not think Mr. Baci stated his reasons. Tr. 23,996 (Hukill). Mr. Hukill was asked what he assumed were the reasons why the NRC Staff did not want management to be present. Mr. Hukill said:

I think that, myself, I thought he could probably work the guy over harder without management there to watch them. That was my own personal opinion. I frankly — the main reason I wanted to go up was to ensure our people were treated fair, as well as to gain knowledge I wanted to make sure that my people were treated fair, and I felt our presence would ensure that.

Id. The conversation then moved up the administrative ladder, and Mr. Arnold discussed management's presence with Mr. Stello, who is Mr. Baci's superior on the NRC Staff. Mr. Arnold stated on the witness stand why he opposed the NRC Staff's position. He said:

My own sense of fair play is people being interviewed in these types of circumstances ought to be aware of whatever flexibility they have in the way in which the interview is conducted. I just do not think that you can assume that the average person that may be subject to these interviews has the degree of familiarity with the procedures and that he ought to, in a sense, be completely on his own to look out for himself.

Tr. 23,656-657 (Arnold). Mr. Stello then decided to allow the interviews to go forward with management present. Apparently, Mr. Stello had not recognized that management's involvement in the cheating was an issue, and he had not yet received a legal opinion on the question from the Executive Legal Director. Tr. 25,430 (Ward). When Mr. Stello did recognize the issue of management involvement, and got a legal opinion, he changed his mind. *Id.* However, the Staff's first investigation was done

with management present at all the interviews except one, which was conducted off-site. Ward, ff. Tr. 25,274 at 18. By the time of the second and third investigations, the issue of management involvement had become clear, and no management representative was allowed. Tr. 25,430-431 (Ward); Hukill, ff. Tr. 23,913 at 9.

186. The NRC investigators all agreed that management's presence "did inhibit the free flow of information." Ward, ff. Tr. 25,274 at 18. However, they did not see "Mr. Arnold's constraints as being malevolently motivated, notwithstanding the fact that they could have adversely affected our ability to obtain all of the information that we felt we needed." *Id.* at 19. The Staff's position on this point is considered further in ¶¶ 291-298, below.

187. It seems clear that management did inhibit the flow of information. The opinion of the NRC investigators to this effect was unchallenged. Mr. Hukill, a former Navy captain, is several management levels above the operators. He is an imposing man. When W was scheduled to meet with Mr. Stello in Bethesda, W was offered the opportunity to have Mr. Hukill present. W declined because "I respected the man [Mr. Hukill], and I guess I had a guilt feeling about admitting my participation to Mr. Stello, and I just did not want Mr. Hukill present at the time." Tr. 26,164(W). During W's interview by the NRC investigators, he was asked whether he would sign a sworn statement. He turned to Mr. Hukill and asked: "Would the company care?" TMIA Ex. 55 at 5; Tr. 26,167(W). W explained that he "knew . . . there was a serious problem, and . . . did not know how the company was going to respond . . ." Tr. 26,167(W). Finally, there is the question of confidentiality. If any operator had evidence of management participation in the cheating, it would have been impossible, with management in the room, for NRC to receive it on a confidential basis.

188. In view of this evidence, it is difficult to regard management's presence as proper. Management knew that its presence would "inhibit the free flow of information;" its presence did so. Mr. Hukill's desire to "make sure that my people were treated fair" is legitimate, but his desire to prevent NRC from "work[ing] the guy over harder without management there to watch them" is not, because the discovery of cheating in these circumstances requires vigorous questioning. Tr. 25,387 (Ward). Mr. Arnold's concern that an operator not "be completely on his own to look out for himself" is either a concern that the operator "on his own" might divulge something detrimental to himself — which is not a proper concern if there is something detrimental to divulge — or a concern that the operator "on his own" might divulge something detrimental to management

— which is not a proper concern either. Management's burden on the flow of information did not produce any corresponding benefit. I find that this action by management was improper.

Management's dealings with O and W

189. After the NRC investigation of O and W was complete, and O and W had admitted cheating, Mr. Arnold interviewed each of them. During these interviews he informed them that they were fired. Tr. 23,666-667 (Arnold). He made that decision after consulting with all levels of senior management. *Id.* at 23,674-675. The sole issue which arises out of these dealings is management's failure to ask either O or W why he cheated. Mr. Arnold, in response to questions about this failure, said that he "would not have attached too much reliability to any rationalization they would have given me at that time." *Id.* at 23,784. It was pointed out that if the cheating were caused by inadequacies in the training program, by a feeling that the NRC examination was unfair, or by some other specific problem which the Licensee could take steps to overcome, then it would be useful for the Licensee to discover this cause. Tr. 23,785 (Milhollin). Mr. Arnold responded:

. . . the only way in which the company could proceed is to assume that all of those things or any one of those things may have contributed so that our action had to address, in my opinion, all of the potential reasons independent of which ones they themselves may have selected.

Id. at 23,785.

190. These responses by Mr. Arnold are not acceptable. If management truly did not know why these men — who were regarded as the "cream of the crop" (see ¶ 10, above) — had cheated, then it was in management's immediate interest to find out. Management had to take steps to prevent future cheating. As a matter of allocating resources, the Licensee would naturally move to meet the principal cause first. This evidence shows either that the Licensee did not care why O and W cheated — which is unlikely given management's interest in finding out — or that the Licensee already knew why they cheated. The latter explanation is the only plausible one. It is consistent with Mr. Hukill's testimony about the operators being "driven" to cheat (¶ 327, below) and it fits into the testimony about the operators' poor attitude toward the NRC examination (see ¶¶ 278, 327, below). The conclusion here is that management did not need to ask why the cheating occurred; management knew that it was caused by the operators' disrespect for the NRC examination.

Management's meetings with employees

191. The cheating by O and W was discovered in late July and early August, 1981. O and W were fired in early August. On August 4 Mr. Arnold met with the operators to explain the reason for his decision to fire O and W. Arnold, ff. Tr. 23,590 at 7-8. GG testified that the message he received from that meeting was that "we live constantly in the public eye and that if you cannot stand being watched, then maybe you are in the wrong business, that he in no way would tolerate cheating." Tr. 25,701(GG). Following this meeting, Mr. Hukill met with each of the licensed operators, by shift, from one to two hours. Hukill, ff. Tr. 23,913 at 10. He explained management's position in more detail, and requested comments from the operators. *Id.* at 11. He learned that there was a serious problem of morale. *Id.* He also learned that there was a need to change the operators' attitude about the NRC examination process. *Id.* During the weeks of October 5 and 12, Mr. Hukill met individually with every licensed operator who had taken the NRC examination in April. *Id.* at 13. His purpose was to insure that each operator understood the responsibility of an "operator in a company which is regulated" and an operator's responsibility for the public health and safety. Tr. 23,951 (Hukill). He also asked each operator whether the operator had cheated on any of the examinations given by Mr. Kelly, by ATTS, by the NRC, or by the Licensee as a make-up quiz on Category T. *Id.* Finally, he asked each operator whether the operator knew of any cheating on these examinations. *Id.* In response to the last question, some of the operators reported that they had seen cheating. TMIA Ex. 60. OO reported that "cheating on exams in [the] past has been commonplace and accepted." *Id.* Mr. Hukill did not follow up on this report, however, because Mr. Wilson, rather than Mr. Hukill, was conducting the Licensee's investigation. Tr. 23,958 (Hukill). Mr. Hukill gave his interview notes — which contained OO's statement — to Mr. Wilson (Tr. 23,925-926 (Hukill)) but Mr. Wilson did not follow up on OO's report either.

Management's response to the Shipman incident

192. The Shipman incident is described in ¶¶ 94-100, above. It was not until October 7, 1981 that Mr. Shipman first informed the Licensee of his action at the coffee machine. See ¶ 95, above. Mr. Hukill's immediate response was to question Mr. Shipman vigorously in order to discover the identity of the person who asked Mr. Shipman the question. *Id.* Mr. Shipman was shown a list of the persons in the room from which the questioner probably came, but this did not help his memory. *Id.* The

Licensee did not ask any of the examinees in the smokers' room whether they had asked Mr. Shipman the question. *Id.* Mr. Hukill admitted that asking them "might have been a good idea in our company investigation." Tr. 23,991 (Hukill). However, Mr. Hukill was not conducting that investigation; Mr. Wilson was. *Id.* There is no indication that Mr. Wilson asked them. The Licensee so admits. *Lic. Proposed Findings* ¶ 261. The Licensee contends, however, that this incident was covered by Mr. Hukill's interviews with all the operators at TMI-1, in which he asked each operator whether that operator had cheated or knew of any cheating on the NRC examination. See ¶ 191, above. There are two problems with this contention. The first is that Mr. Hukill did not interview all the persons in the smokers' room. Two of these persons were training instructors (*Lic. Ex. 83*) whom Mr. Hukill never questioned. *TMIA Ex. 60*. The second is that a broad question is always subject to interpretation, and to vagueness in memory. Mr. Shipman stated repeatedly that he had never considered this as a cheating incident until he discussed it with Mr. Hukill. See ¶ 97, above. Mr. Shipman's questioner could have had an even narrower understanding of "cheating" than Mr. Shipman, and could have failed to reveal his participation under such a broad question. See, e.g., WW's failure to mention the telephone call he received during the Kelly examination because he was not specifically asked about it by the NRC investigators. *Staff Ex. 28 Encl. 1*. See also the similar experience of OO. Tr. 25,976-977(OO). It is also possible that the event might not come to mind unless the person being interviewed were specifically asked about Mr. Shipman. Finally, a person who remembered the event, and deliberately failed to disclose his participation, might have been encouraged to do so by the possibility of being able to claim later that he had interpreted "cheating" narrowly, or had not remembered the event while he was being questioned broadly by Mr. Hukill. This latter possibility is avoided by a specific question mentioning Mr. Shipman.

193. In view of the obvious utility of questioning the eight persons in the smokers' room about Mr. Shipman, and the ease with which it could have been done, it is difficult to see why the Licensee did not do it. If the Licensee had been trying to find Mr. Shipman's questioner, such a step would have been strange to omit. When one considers that Mr. Shipman's failure to remember the questioner was itself so dubious (see ¶¶ 94-100, above), and appeared dubious to the Licensee (see ¶ 96, above), the Licensee's failure to take this step is very difficult to understand.

194. The Licensee's disciplinary action against Mr. Shipman was a letter of reprimand. This action was based upon his good record during seven years' employment. See ¶ 96, above. Also in Mr. Shipman's favor was the fact that his act was not premeditated — it occurred spontaneously at the coffee machine — and the fact that he had reported it

voluntarily to Mr. Hukill. However, against Mr. Shipman was the fact that he did not appear to be telling the truth. As stated in ¶¶ 94-100 above, his denial was against the weight of the evidence.

195. I find that the Licensee's investigation was inadequate because the Licensee did not question the eight persons in the smokers' room. I also find that the Licensee should not have accepted Mr. Shipman's statement as truthful.

Management's response to rumors about U

196. On September 22, 1981, KK went to Mr. Ronald Toole, Operations and Maintenance Director, TMI-1, to report a rumor. KK had heard that someone had been stationed in the vicinity of the examination to assist examinees, and he connected that rumor to the telephone call he had received from a person identifying himself as U. See ¶ 123, above. KK told Mr. Toole that he had received the call and that he had heard the rumor. Staff Ex. 27 at 32. Mr. Toole informed Mr. Wilson and Mr. Arnold of what KK had said. *Id.* Mr. Wilson apparently encouraged KK to give this information to the NRC investigators (Staff Ex. 27 at Encl. 8), which KK did on the next day. Staff Ex. 27 at 30. KK also told the NRC investigators that he had heard that the person stationed outside the examination room "was performing his duty . . . with at least the knowledge of someone higher up in the company." Staff Ex. 27 at 30.

197. Mr. Wilson described the telephone call to KK in his prepared testimony. Wilson, ff. Tr. 24,478 at 13-15. After setting out the circumstances of the call, Mr. Wilson concluded:

Based on my discussion with KK, my review of the NRC's discussion with U, and previous interviews I had had with U concerning rumors of cheating, Mr. Lloyd and I concluded that there was no basis for disbelieving U's denial of cheating. The NRC concurred with this opinion in OIE's Supplemental Investigation Report dated October 13, 1981 in the section entitled "Conclusions of Reporting Investigators.

Id.

198. From management's point of view, the rumor that someone was stationed outside the examination room was very serious. It implied a conspiracy. And KK's statement that the person stationed was acting with the knowledge of "someone higher up," implied a conspiracy touching management. However, Mr. Wilson did not mention this rumor in his direct testimony, and the Licensee did not investigate it. Wilson, ff. Tr. 24,478 at 13-15. Mr. Wilson's discussion with KK was limited simply to

what KK had heard. It could not discover what U and Mr. Husted knew about the rumor, or what the other candidates knew about it. Mr. Wilson's reliance on "previous interviews I had had with U concerning rumors of cheating . . ." does not refer to the rumor about U in Mr. Husted's office. The "previous interviews" took place before KK even reported that rumor. See ¶ 130, above. Thus, Mr. Wilson's conclusion rested only upon one ground: his review of NRC's discussion with U." That was the discussion in which U insisted that the word "knowingly" be inserted to qualify his denials. See ¶ 117, above. The Licensee seems never to have questioned U about his presence in Mr. Husted's office. Nor did it ever question Mr. Husted to discover why Mr. Husted decided to make his office available. Questioning Mr. Husted would have been a logical first step in tracking the rumor down. Mr. Husted's interview with the NRC investigators did not cover this rumor. Staff Ex. 27 at 16. The Licensee did not ask Messrs. Ross, Brown, and Boltz, the TMI reviewers, whether they observed U talking to anyone who was taking the examination. The reviewers were present in the office area during almost all of the time the examination was given, and were frequently searching there for training materials. See ¶¶ 140, 147, 153-178, above. They would have been in a position to observe U's behavior.

199. In view of the seriousness of this rumor it is difficult to understand why the Licensee did not investigate it. The Licensee investigated the rumor that U wrote on his hand and took crib sheets into the examination room (see ¶ 130, above) and it did so after NRC had already investigated that rumor. Tr. 24,607 (J. Wilson). If the Licensee was unwilling to rely upon the NRC to investigate the rumor that U had written on his hand and used crib sheets (an isolated incident of cheating) it seems odd that the Licensee would rely upon the NRC to investigate a rumor of conspiratorial cheating which implicated the Licensee's management. The NRC's investigation of both these rumors was incomplete. The Licensee's lack of interest in the latter rumor is unexplained.

Management's response to cheating on weekly quizzes

200. The first step in the Licensee's investigation of the weekly quizzes was to hire Mr. Edward V. Trunk, an Assistant Professor of Engineering at the Pennsylvania State University, Capitol Campus. Mr. Trunk and one of his colleagues, Mr. Donald L. Miller, reviewed the examinations given by Mr. Kelly in April of 1980, those ATTS examinations given in April of 1981 which had not been reviewed by the NRC investigators, and several sets of weekly quizzes. Mr. Trunk and Mr. Miller searched the answers of

all these examinations and quizzes for similarities. J. Wilson, ff. Tr. 24,478 at 3-4; Trunk, ff. Tr. 24,831 at 5, 8, 10-11. Mr. Trunk and Mr. Miller then filed written reports to the Licensee. See Lic. Ex. 70A-70E. Several sets of similar answers were discovered. *Id.*

201. On the basis of these findings by Mr. Trunk and Mr. Miller, Mr. John Wilson then began the Licensee's investigation. J. Wilson, ff. Tr. 24,478 at 4. Mr. Wilson, with the help of an associate, Mr. Lloyd, interviewed the operators whom Trunk and Miller identified as having given similar answers. Mr. Wilson did not interview W, who by that time had been fired, or Y, who was on an extended leave of absence. *Id.* at 4-12; Tr. 24,555, 557 (J. Wilson). Mr. Wilson interviewed G, H, S, GG, MM and BB. All of these operators denied cheating, and Mr. Wilson believed their denials. *Id.*, at 8-12. Mr. Arnold was satisfied with Mr. Wilson's investigation. Tr. 23,685 (Arnold). So was Mr. Ward of the NRC Staff. Ward, ff. Tr. 25,274 at 14. In order to evaluate Mr. Wilson's work, one must examine each particular item he investigated.

a.) G and H

202. Mr. Wilson began with G and H. The first similarity was on the question about natural circulation. See ¶¶ 29-32, above. H's answer matched the lesson plan, and G and H told Wilson they had memorized the lesson plan. J. Wilson ff. Tr. 24,478 at 6. Mr. Wilson found this explanation reasonable. *Id.* There does not appear to be any basis for questioning either Mr. Wilson's method or his conclusion on this item.

203. The second similarity was on the "two major areas of weakness noted by the Lessons Learned Task Force." See ¶¶ 33-37, above. The two identical answers by G and H ("Human factors, operational safety") did not match any of the five possible answers listed in the answer key, and were marked wrong on one occasion. See ¶ 36, above. G told Mr. Wilson that G chose these two answers because they seemed the most important of the five. See ¶ 34, above. Apparently, H did not say why he chose the answers. TMIA Ex. 75 at 4. Mr. Wilson gave no explanation for this similarity in his notes, except to say that the responses matched the answer key (TMIA Ex. 75 at 4), which is not correct. See ¶ 36, above. Mr. Wilson did not mention this item in his prepared testimony. J. Wilson, ff. Tr. 24,478. He was asked about it on the witness stand, but he gave no explanation other than to report that G and H said that their particular responses were "drummed into" them. Tr. 24,514-515 (J. Wilson). Mr. Wilson admitted that he did not find these two answers on the papers of other operators. *Id.* at 24,520. Mr. Wilson failed to formulate any plausible explanation for this item, yet he did not consider it evidence of cheating.

204. The next item was the question about "the primary deficiency" in the "general area of operational safety." See ¶ 38, above. Mr. Wilson examined the papers of other operators and discovered that "operator training," which was the answer which G and H gave, was a "universal response." *Id.* Mr. Wilson's method here was adequate and his conclusion reasonable.

205. The next item was the question on the Rosemount transmitter. Mr. Wilson testified that when he interviewed G about the Rosemount transmitter, G told Wilson that G specifically recalled the question and his answer, "forced balance rosemont." Tr. 24,522 (J. Wilson). Mr. Wilson said that G "thought training was wrong in emphasizing a trade name as opposed to a functional description." *Id.* at 24,522-523. After G made this explanation, Mr. Wilson concluded that "Mr. G did in fact know the information." *Id.*, at 25,523.

206. Mr. G did not, of course, "know the information." The Rosemount transmitter does not use the "forced balance" principle. See ¶ 41, above. Mr. Wilson could have discovered this fact very easily by calling the training department, where the correct information was available. See, e.g., Tr. 24,786-787 (Brown); Lic. Ex. 82A. Mr. Wilson consulted the training department for lesson plans and answer keys; it is odd that he did not consult it to verify G's explanation. If he had done so, he could have probed the source of G's and H's identical misunderstanding of these devices. It was a clear error for Mr. Wilson not to check G's explanation with the training department.

207. The next item was the question asking "how hydrogen gas is generated . . . following a LOCA." G and H both said that it was generated by an "aluminum, zirconium water reaction." See ¶ 44-48, above. These identical wrong answers, which make no functional sense, were never explained. *Id.*; TMIA Ex. 75 at 8. Mr. Wilson admitted that no other operator gave such an answer. Tr. 24,531 (J. Wilson). But he stated in direct testimony that he "had no basis for disbelieving G's and H's denials that they had collaborated . . ." J. Wilson, ff. Tr. 24,478 at 7. On cross examination, it appeared that Mr. Wilson based his conclusion simply upon the denials. Tr. 24,527 (J. Wilson). Given answers which are identically wrong, make no functional sense, and are unexplained, one would have to place a great deal of faith upon a denial in order to believe it. There was nothing in the demeanor or testimony of G or H at the hearing which would justify such faith. The testimony of G made such faith impossible. See ¶¶ 61-66, above. There is no reason to believe that either G or H was more credible during Mr. Wilson's interviews than at the hearing. Mr. Wilson's position on this item appears to lack any identifiable basis.

208. The next similarity was on the question asking for the location of the newly-installed radiation monitors. Both G and H answered that the monitors were located in the control room; the correct answer was that they were located in the plant. See ¶¶ 53-54, above. Mr. Trunk did not detect these similar wrong answers, and Mr. Wilson would not concede that they were similar. *Id.* The only difference in the answers was their wording. The question asked where the monitors were located. G answered: "Monitors are located in Unit #1 control room;" H answered: "Control Room." *Id.* When he was asked why he did not consider these answers to be similar, Mr. Wilson said: ". . . Mr. Trunk was the expert in identifying parallelisms. I do not see that as a parallelism. I can see that an argument may be made for it as being one, but I do not really identify it as a parallelism." Tr. 24,512 (J. Wilson). In an investigation of cheating, answers which are the same, and which are wrong, are "similar." The additional words used by G do not make the answers dissimilar in any meaningful sense. Mr. Wilson's position contradicts the obvious meaning of these answers.

209. Mr. Wilson also investigated the questions which required lists of process lines and radiation monitors. According to Mr. Wilson, G told Mr. Wilson that G listed the process lines in an order which G had learned. TMIA Ex. 75 at 11. The logic of the order was confirmed by E. *Id.* According to Mr. Wilson's notes, H told Mr. Wilson that H had memorized this order either from training materials, by order of importance, or by system. *Id.* At the hearing, however, H testified that he did not remember why he used the order he did. Tr. 25,898(H). With respect to the radiation monitors, G and H made an identical error on RMG-19. See ¶¶ 55-57, above. G told Mr. Wilson that training had never told G and H of the change in the training materials which caused this answer to be wrong. TMIA Ex. 75 at 16. At the hearing, H took the same position. Tr. 25,898-899(H). Mr. Newton and E, however, told Mr. Wilson that G and H had been told of the change. TMIA Ex. 75 at 16. At the hearing, Mr. Wilson testified that "it was never my understanding that this information got to Messrs. G and H in a timely fashion . . . prior to taking the March test." Tr. 24,545-546 (J. Wilson). Although the weight of the evidence is that G and H were informed of the change, and thus that they cooperated on the radiation monitor question, the possibility that G and H were not informed of the change gives at least some support to Mr. Wilson's conclusion. With respect to the question about process lines, Mr. Wilson's position is reasonable if based on the information which he recorded in his notes. However, H's testimony that H did not remember why he used the order he did contradicts those notes. The reasonableness of Mr. Wilson's position thus depends upon what H in fact told Mr. Wilson during their interview.

210. The last item is the question on Bernoulli's equation. In his prepared testimony, Mr. Wilson said that G and H told him that they had memorized their uniquely similar definition "either from a common answer which they may have prepared in preparation for the quiz or from language placed on the blackboard by the instructor." J. Wilson, ff. Tr. 24,478 at 8. G and H denied cooperating and Mr. Wilson "found no reason to disbelieve their denials." *Id.* On the witness stand, H said that he *independently* memorized his answer from the blackboard. See ¶64, above. G said that he and H had memorized their answers *together* from one of H's textbooks, in preparation for training week. See ¶¶ 62-63, above. Thus, Mr. Wilson's testimony reflects both statements by G and H. However, it does not reflect the fact that the statements contradict each other. It is obviously impossible for the statements of both G and H to be true. Mr. Wilson's testimony definitely implies that G and H told him that *either* they *both* memorized the definition from the blackboard, *or* they *both* memorized it from a common source in preparation for training week. Since G and H must have given Mr. Wilson the same explanation they gave at the hearing — otherwise the source of the two explanations given by Mr. Wilson is unexplained — Mr. Wilson must have known that G and H had contradicted each other during their interviews. For Mr. Wilson to submit written testimony implying the contrary was misleading. Both the Licensee, which sponsored the testimony, and Mr. Wilson must have known it was misleading. In fact, the contradictory statements by G and H, together with their unique definition, led to only one conclusion: that G and H had cooperated. Mr. Wilson avoided reaching this conclusion only by misrepresenting those contradictory statements.

211. It was also necessary for Mr. Wilson to evaluate the overall pattern of similarities for G and H. The sheer number of similarities was striking. See ¶74, above. Mr. Wilson gave a series of interrelated reasons for concluding that the pattern was caused by memorization rather than cooperation. First, with respect to the quiz of June 25, 1981, Mr. Wilson said that the similarities must have been caused by memorization because the quiz was closely proctored. J. Wilson, ff. Tr. 24,478 at 8. There were only two similarities on that quiz; the answers were short and matched the answer key. See ¶67, above. Mr. Wilson is correct in saying that they were probably memorized. The importance of the proctor is doubtful, however, in light of the fact that O and W copied extensively with the NRC proctor only twenty feet away. See ¶13, above. Second, with respect to the similarities on the quiz of March 27, 1981, Mr. Wilson said they were caused by memorization because that quiz was a take-home quiz. Mr. Wilson's theory was that if G and H had cooperated on that quiz, they would have passed. J. Wilson, ff. Tr. 24,478 at 8. Also, he said, there would have been a greater number of similarities if they had cooperated.

Id. Mr. Wilson was cross-examined on his theory that cooperation would have caused G and H to pass. He could not explain why cooperation would have that effect. Tr. 24,537-538 (J. Wilson). When Mr. Trunk was asked about this theory, he said: "I do not know if there is any correlation, to be honest. You can cheat and pass; you can cheat and fail." Tr. 24,869-870 (Trunk). With respect to Mr. Wilson's theory that cooperation would have produced more similarities, there was no evidence. Mr. Wilson appeared to express this theory as an opinion of his own. The number of similarities identified on this quiz of March 27 was already large—the similarities accounted for 8 points out of the possible 13.5. See ¶74, above. The only piece of evidence in the record on the question whether the lack of similarity on one question indicated the lack of cooperation on another was given by W, who indicated that there was no correlation. He said: "If I knew the answer, I wrote it down. If not, then I tried to get help." Tr. 26,085(W).

212. The remaining similarities were on the quizzes of November 2, 1980 and November 26, 1980. The quiz of November 2 contained the question on Bernoulli's equation, in response to which G and H gave their unique definition. See ¶58, above. The quiz of November 26 contained the questions which were answered "forced balance rosemont," "aluminum, Zr. water reaction," and "human factors, operational safety." See ¶¶ 33, 40, 44, above. Mr. Wilson did not explain the pattern of similarities on these quizzes in terms of the quizzes themselves. J. Wilson, *ff.* Tr. 24,478 at 8. Instead, his explanation was that since Mr. Trunk had identified similarities on the quiz of March 27, 1981, and the similarities on that quiz were caused by memorization (according to Mr. Wilson's conclusion about that quiz) then the similarities on the quizzes of November 2 and November 26 must also have been produced by the same "similarity in approach to taking quizzes; namely memorization." *Id.* By this theory Mr. Wilson assumed that the similar answers given on the March 27 quiz were memorized, and he assumed that if similar answers were memorized on one quiz they must have been memorized on another. His first assumption, that the similar answers on the March 27 quiz were memorized, is not in accordance with the facts. See ¶¶ 33, 44-48, 49-52, 55-57, above. His second assumption, that if similar answers were memorized on one quiz they must have been memorized on another, is no more logical than its opposite, which is that if similar answers were copied on one quiz they must have copied on another. Neither this latter assumption nor its opposite has any evidentiary basis. One cannot escape the fact that the only way to determine whether similar answers on a given quiz were memorized or copied is to look carefully at the similar answers on that quiz. The pattern of similar answers on the November quizzes was different from the pattern of similar answers on the other quizzes, and

required a different analysis. Mr. Wilson's failure to make such an analysis leaves the pattern of similarities on the November quizzes without any explanation.

213. Mr. Wilson's testimony was presented as that of an impartial investigator. J. Wilson, ff. Tr. 24,478 at 19. As such, his obligation was to find and present evidence tending to show both the presence of cheating and the absence of cheating. He presented considerable information which tended to show the absence of cheating. He supplied the lesson plan for the question on "natural circulation," which showed that G and H had probably memorized the answer to that question. TMIA #75, Attachment A; ¶¶ 29-32, above. He supplied the fact that an apparently incorrect answer, "operator training," was the one which most operators gave, and thus showed that G and H probably did not cooperate on that answer. See ¶¶ 38-39, above. On the questions requiring lists of equipment, Mr. Wilson conferred with the training department and a shift supervisor to determine that the order used by G and H was logical. See ¶¶ 49, 209, above. He also found other lesson plans and answer keys which were helpful. TMIA Ex. 75, Attachments B, C, D, E.

214. With respect to the other half of this responsibility, which was to find and consider evidence tending to show cheating, Mr. Wilson was not helpful. Mr. Wilson asked G and H whether they sat together, but he did not ask anyone else in the room with G and H where G and H sat (Tr. 24,508 (J. Wilson)) or whether anyone saw G and H cooperating (Tr. 24,532 (J. Wilson)). He did not check G's explanation of "forced balance rosemont" with the training department. See ¶¶ 204-206, above. He did not report in his written testimony the fact that the weekly quizzes were poorly proctored, that cooperation occurred, and that the operators were unsure whether they were expected to do their own work. Wilson, ff. Tr. 24,478 at 4-9; ¶¶ 68-73, above. He admitted on cross-examination that he had been informed of these conditions by U (Tr. 24,612-615 (J. Wilson)) but he said that U was referring to the time prior to the Kelly examination. *Id.* U's testimony on the stand showed that U was not referring to that period. See ¶70, above. See also the testimony in ¶71, above. An even-handed report would have discussed these conditions, which Mr. Wilson could have learned from the operators or the training instructors. Both the operators and the instructors testified freely at the hearing about the conditions during the quizzes. See ¶¶ 68-73, above. Lack of proctoring, talking about questions, and "group efforts" were highly relevant to the issue Mr. Wilson was deciding; these factors should have been discussed and considered before Mr. Wilson reached his conclusion.

215. What overall conclusion should one draw, on Mr. Wilson's investigation of G and H? Mr. Wilson did find training materials which showed that some of the similarities were benign. He also reviewed the quizzes of

other operators, and presented explanations from training instructors and shift supervisors, which showed that still more similarities were benign. All these efforts were responsible and helpful. However, there was a great deal of evidence which pointed to copying that Mr. Wilson did not present or consider. He did not disclose or consider the contradictory statements by G and H on how they learned Bernoulli's equation. He did not take the easy and obvious step of checking G's explanation of "forced balance Rosemont" with the training department. He refused to recognize the similarity of identical wrong answers which said that the new radiation monitors were located in the "control room." Finally, he did not disclose or consider in his direct testimony the highly relevant issue of how the quizzes were proctored, whether there was talking, and whether operators were expected to do their own work. With respect to the evidence he did consider, he consistently interpreted it the same way, as not indicating copying. He did so even when there was no apparent basis for such an interpretation. He interpreted the answers "Human factors, operational safety," in ¶¶ 33-37 above, as not indicating copying despite the fact that they were unique, identical, unexplained, and partially wrong. See ¶203, above. He interpreted the answer "aluminum, zirconium water reaction," in ¶¶ 44-48 above, as not indicating copying despite the fact that it was unique, identical, unexplained and totally wrong. Moreover, this answer made no functional sense. He interpreted the long definition of Bernoulli's equation in ¶¶ 58-66 above as not indicating copying despite the fact that the definition was unique to G and H, the same word-for-word through several lines, and unexplained except by G's and H's mutually contradictory statements of how they learned it. With respect to the overall pattern of similar responses by G and H, Mr. Wilson advanced his theories that copying causes one to pass, that cooperation would have produced more similarities than were found (similar answers were found on 8 points out of the possible 13.5 on the quiz in question) and that if similar answers were memorized on one quiz they would be memorized on another. On balance, one must conclude that Mr. Wilson failed to pursue, present, or consider important evidence of copying. And, with respect to the evidence he did consider, Mr. Wilson interpreted it in such a way as to reveal the lack of any principled basis for his conclusions. In effect, Mr. Wilson's presentation on G and H was that of an advocate for the Licensee's interest. Mr. Wilson appeared to view that interest as being advanced by minimizing the evidence of copying. I cannot find that Mr. Wilson acted as an impartial investigator of G and H. Nor can I find, for the reasons already stated, that his investigation was adequate.

b.) S and Y

216. The similarities between S and Y are discussed in ¶¶ 80-81, above. Mr. Wilson produced a lesson plan which matched S's answer. *Id.* The answers were correct, and were similar to those of other operators. *Id.* Mr. Wilson's method here was adequate and his conclusion was reasonable.

c.) GG, W, and MM

217. Mr. Wilson also investigated the similar answers of GG, W, and MM. These answers, which are discussed in ¶¶ 82-93 above, responded to the question asking for two of the major areas of weakness identified by the Lessons Learned Task Force. All three operators used similar, abstract language (e.g., "nonsafety related systems affecting safety systems operator action compounding the challenge (sic) to safety systems") which was quite different from the answer key. *Id.* Also, all the operators misspelled the word "challenge" as "challange." Mr. Wilson interviewed GG and MM; they both denied copying. J. Wilson, ff. Tr. 24,478 at 11, 12. Mr. Wilson concluded at first that the answers of GG and W "were so similar that without an acceptable explanation from W and GG, cheating appeared to be the only possible explanation." *Id.* at 12. Then, however, Mr. Wilson interviewed GG, who denied copying from W but suggested that W might have copied from him. *Id.* Based upon this interview, Mr. Wilson concluded that "there was no reason to disbelieve GG's denial." *Id.* Mr. Wilson did not interview W, who by this time had been fired. *Id.*

218. It is apparent that Mr. Wilson based his final conclusion upon the denials alone. His initial conclusion was that the similarities showed copying unless there were an "acceptable explanation." Were the denials an "acceptable explanation"? It is difficult to see how they could have been, even considering that W had already confessed to copying from O on the NRC examination. The only evidence of who copied from whom was GG's crossed out word; this indicated that it was GG, not W, who copied. See ¶93, above. Mr. Wilson does not appear to have considered GG's description of how the quizzes were administered. At the hearing, GG said the atmosphere was informal, that talking frequently occurred, and that course materials were present. Tr. 25,696-697(GG). This information was available from GG for the asking. *Id.* Also, Mr. Wilson did not investigate why all three operators had identically misspelled the word "challenge." This misspelling was obvious from their answers. Finally, Mr. Wilson did not pursue the stilted and unnatural language in which the three operators expressed their answer to Question 1, or the striking difference between this language and the answer key. When Mr. Wilson testified, he stated that no answer key was available for Question 1. He said: "I believe this is the one that we tried to track down with considerable effort . . ." Tr. 24,570 (J. Wilson). When it was pointed out that an answer key would be particularly helpful, in view of the abstract phrases used by the operators,

he said: "It would be very helpful, and that is why we went to the extensive effort that we did." *Id.* In fact, an answer key was available; Mr. Blake, Licensee's counsel, introduced it the next day. Lic. Ex. 68B; Tr. 24,693 (Blake).

219. From what has been said above, it is clear that Mr. Wilson failed to develop or pursue evidence of cheating which was clearly relevant. His conclusion that there was no cheating required him to accept a denial, standing alone, as more persuasive than the clear evidence pointing the other way. Mr. Wilson's investigation of cheating by GG, W, and MM was not adequate.

Management's response to cheating by VV and O in 1979

220. In early July of 1979 VV, who was Supervisor of Operations at TMI-2, handed in to the training department a closed-book, make-up examination comprised of four sections. Miller, ff. Tr. 24,358 at 1, 5. Of these four sections, two were written in the hand of VV, one was written in the hand of O, and one was written partly in the hand of VV and partly in the hand of O. Miller, *id.*, at 1. The examination was to have been completed by the examinee alone. Tr. 24,387 (Miller). At this time, O was VV's subordinate. Miller, ff. Tr. 24,358 at 4. O, it will be recalled, was the person involved with W in copying on the NRC examination in April of 1981. See ¶10-25, above.

221. VV was required to submit this make-up examination because, since 1977, he had been delinquent in his training requirements. In 1977 he sat for a "cross-licensing" examination. TMIA Ex. 64; Tr. 24,366-368 (Miller). This examination was designed to extend licenses for TMI-1 to TMI-2. VV received a score greater than 70% on that examination, which met the NRC's requirement, so he became licensed on TMI-2. Tr. 24,367-368 (Miller). However, he received less than 80% on two sections of the examination, which meant that he was required to receive additional training in the subjects covered by those sections. *Id.* at 24,368; TMIA Ex. 65. This additional training, called Fundamentals and Systems Review (FSR), was not scheduled to begin until March, 1978. TMIA Ex. 64. In February, 1978, before the FSR training began, VV sat for the annual requalification examination on TMI-1, which he passed, again with a score greater than 70%, but on which he scored less than 80% on three sections. TMIA Ex. 64, 66. One of those three sections was the same as one of the sections he had missed on the cross-licensing examination. *Id.* Since he was required to receive additional training in every section on which he had

received a score of less than 80%, he then had a total of four different sections in which he was delinquent at the beginning of the FSR training cycle in March of 1978.

222. VV attended very few of these FSR sessions in 1978. TMIA Ex. 64, 66. As a result, he was sent take-home, make-up examinations in January of 1979. Tr. 24,378 (Miller); TMIA Ex. 66. He did not return these examinations, so they were sent to him again in March of 1979. *Id.* By July 1, 1979, VV had reached the absolute deadline for complying with his training requirements. Tr. 24,379 (Miller); TMIA Ex. 64. On the evening of that day he went to the shift supervisor's office to look up material for answers to the examination questions (Staff Ex. 26 at 40); he was at the site on his own time; it was late; he needed to get home to rest before leaving on vacation the next day in his automobile; he asked O for help. Tr. 26,662(VV). He said "O had the same questions and answers." See ¶224, below. The next day, July 2, the examination was turned in to the training department with answers written by O. TMIA Ex. 66.

223. VV's conduct raised several questions. One of them was what to do about O. The issue was whether O knew that he was helping VV complete a make-up examination. Mr. Miller testified that when he interviewed O, Mr. Miller was convinced that O had no such knowledge. Miller, ff. Tr. 24,358 at 4. Mr. Miller based this judgment upon his long acquaintance with O, O's reputation as "an upstanding individual of unquestioned integrity," the absence of a cover sheet (indicating that the questions were on an examination) attached to the pages which O answered, and the fact that O, as a subordinate, could reasonably be asked by his superior, VV, to "provide answers to some questions." *Id.* On the witness stand, O denied that he knew the questions were part of VV's make-up assignment. Tr. 26,190(O). O said he thought the questions VV asked him were "just another set of questions that somebody wanted some answers to." Tr. 26,191(O). When VV was asked whether he thought O knew the purpose of VV's request, VV said: "I do not know what was in his mind" Tr. 26,640(VV).

224. O was interviewed by the NRC investigators on July 30, 1981. Staff Ex. 26 at 42. When the investigators brought up the incident involving VV, O "appeared dismayed and looked nervous and upset." *Id.* The investigators also interviewed VV, by telephone, on the same day. *Id.* at 40. VV told the investigators that he had gone to the shift supervisor's office to look up material for answers to the take-home examination. *Id.* He recalled that O "had the same questions and answers" (which implied that O had already responded during training to these same questions), and he said he put a cover sheet on both his and O's answers and submitted them in that form. *Id.* At the hearing, it was pointed out that the question sheets which O filled out had the identifying marks of an

examination. Tr. 24,398-399 (Bradford). On one page, the words "SRO 10.0 pts" were in the upper right hand corner, and the page was entitled "*Category H(K) Fuel Handling and Core Parameters.*" TMIA Ex. 67. Mr. Miller testified that operators sometimes used sheets such as these from previous examinations as study aids. Tr. 24,399-400 (Miller).

225. There are two additional points to consider with respect to O. The first is the high technical competence of VV; the second is VV's attitude toward the training program. It was widely agreed by those who testified that VV's technical competence was extraordinarily high. See, e.g. Tr. 24,375 (Miller). It was higher than O's. *Id.* at 24,401. According to Mr. Miller, VV "had an excellent memory. He knew where every valve and switch was His knowledge, intimate knowledge of the unit were very valuable" Tr. 24,422 (Miller). According to Mr. Arnold, "Mr. VV is a very, very capable technical person." Tr. 23,725 (Arnold). These opinions are corroborated by the score which VV achieved when he was reexamined on the areas he had failed: he received 99.8%. TMIA Ex. 72, at Encl. 1. Yet, his training record shows clearly that he did not respect the training program. He did not attend lectures; he did not return assignments; he allowed his delinquency to continue until the last hours of the last day for curing it. Mr. Miller testified that VV "was knowledgeable of the areas in question . . . he just had not bothered to apply himself. He did not have the respect for the training program that he should have." Tr. 24,423 (Miller). Mr. Miller added: "[W]hen he gave it attention, he got a 99.8. And when they all examined him, they had to go back and look up the answers because they were not sure." Tr. 24,424 (Miller). Mr. Miller also said that "I would doubt that he studied. He might have read some things a couple of days before. I mean he just did not have to." Tr. 24,424 (Miller).

226. In view of VV's high technical competence, his disrespect for the training program, and his disinclination to study, one cannot accept Mr. Miller's theory that O could have believed that VV simply wanted O to "provide answers to some questions" (§223, above). First, it is simply incredible, in view of VV's recognized ability, that VV could have wanted these answers written out by O to help VV do his job. VV had no need for such information—and had no respect for such information—for any purpose other than to satisfy his training requirements. O, who worked directly for VV and must have known of VV's competence and attitude, surely knew this. Second, VV believed that there was nothing wrong with what he did—he told Mr. Miller that he believed that he had satisfactorily completed the assignment simply by looking at what O had written—so there would have been no reason for VV not to inform O of the purpose of O's assignment.

227. Thus, the Licensee's conclusion that O did not know the purpose of his assignment rests upon O's denial. In light of what has just been said, it is difficult to see how Mr. Miller could have accepted that denial. VV testified that he did "not know what was in . . . [O's] mind" See ¶223, above. In the portion of Mr. Miller's testimony which sets forth Mr. Miller's reasons for accepting O's denial, Mr. Miller lists the reputation of O, the absence of a cover sheet, and the fact that VV was O's supervisor. He does not, however, state what VV said about O's knowledge. Miller, ff. Tr. 24,358 at 4. Nor do Licensee's Proposed Findings assert that VV told Miller anything about O's knowledge. *Lic. Proposed Findings* at ¶¶ 305, 310-311. These omissions, in light of VV's testimony at the hearing, are very significant. Mr. Miller's position on O boils down to the following view of the facts: VV, who was O's supervisor and pressed for time, went to the shift supervisor's office late in the evening to look up answers to an examination; O, who was VV's subordinate, was there; VV, who was far more knowledgeable than O, and who disrespected the training program, asked O for help. VV handed O some question sheets with markings which identified them as part of an examination; O "had the same questions and answers"; after O had provided the answers VV placed O's pages together with his own under the examination cover sheet; *and*, during all the time this was going on, VV never told O the purpose of it, despite the fact that VV told Mr. Miller that VV considered the entire procedure as perfectly acceptable, and thus, VV would have had no motive for not telling O the purpose. I cannot find that this view of the facts is credible. VV had neither the motive nor the inclination to appear, late at night, for the purpose of running O through a mysterious exercise in answering examination questions. Things like that do not happen. The most plausible explanation for Mr. Miller's decision not to discipline O is the reluctance anyone would feel in disciplining a subordinate for following the orders of his superior. If that is the explanation for Mr. Miller's position, it would have been better for him to admit it, rather than advancing his theory about O's lack of knowledge.

228. The second question which faced the Licensee was what action to take with respect to VV himself. After VV handed in the examination, the training department graded it. The department attributed the scores on all four sections to VV, despite the apparent fact that VV had not written them all. Miller, ff. Tr. 24,358 at 1; TMIA Ex. 67-70, 72, 74. Then Mr. R. W. Zechman, Supervisor of Training, sent a memo to VV. This was the first communication VV received on this subject. The memo notified VV that because of deficient scores on two of the four sections, he would be required to enter an accelerated training program, and be relieved of licensed duties until that program was completed. TMIA Ex. 72. The memo did not mention anything about handwriting; it simply stated that

the action had been taken because the scores on two of the sections were below 80%. *Id.* VV was credited with passing one of the sections which had been partially written by O. TMIA Ex. 70, 74. All the scores, both good and bad, were attributed to VV as reflecting his knowledge of the four sections. *Id.*

229. Mr. Miller interviewed VV on July 9, after VV had returned from vacation. VV readily admitted O's participation; VV said he (VV) was pressed for time; that he had made no attempt to disguise O's handwriting; that he had studied the material; and that he thought these actions were sufficient to complete the training requirements. Miller, ff. Tr. 24,358 at 3; Tr. 24,396 (Miller). Mr. Miller informed VV that VV's conduct was unacceptable. Tr. 24,396 (Miller). On the basis of this interview, discussions with others, and a review of VV's training record, Mr. Miller recommended that VV be suspended for one week without pay. Miller, ff. Tr. 24,358 at 5; TMIA Ex. 71. Mr. Miller also recommended that a letter describing the incident be placed in VV's personnel file. *Id.* Following a discussion with Mr. Herbein, Mr. Miller increased his recommended period of suspension to two weeks. Miller, ff. Tr. 24,358 at 5. However, VV's suspension was never implemented. Miller, ff. Tr. 24,358, at 5-6; Tr. 23,732, 736-737 (Arnold).

230. On July 3, 1979 VV was placed in the accelerated training program for the two sections he had failed (one of which O had written). TMIA Ex. 72. On July 24 VV received a grade of 99.8% on the two sections. Also, according to Mr. Miller's testimony, VV was examined orally on the section which VV and O had written together. Tr. 24,419, 437-438 (Miller). On August 20, 1979 VV was assigned temporarily to the GPU Accident Investigation Group. TMIA Ex. 54; Tr. 24,446 (Miller). Then, he was assigned permanently to a non-supervisory position to work with outside consultants. Tr. 23,771- 772 (Arnold). He was never returned to his position as Supervisor of Operations at Unit 2.

231. Mr. Arnold testified that he did not follow the recommendation to suspend VV because he (Mr. Arnold) did not believe that suspension was a proper response to the situation. Tr. 23,732, 736-737 (Arnold). Instead, Mr. Arnold believed that VV should be removed from his position. *Id.* Mr. Arnold stated that he came to that decision because he believed there was "a deficiency in the reliability of Mr. VV's judgment in various instances and in particular in situations where his judgment was very important to us as a supervisor." Tr. 23,737 (Arnold). Mr. Arnold said that "a suspension and a reinstatement to his present position would leave us vulnerable to the problems with his judgment . . ." *Id.* He said that removal of VV from his supervisory position was "a much stronger sanction than a two-week suspension . . ." Tr. 23,737-738 (Arnold). He also said that VV's removal "was clearly known to the organization," and that it "was a

very clear signal to the rest of the organization that Mr. VV's performance was deficient in ways that the company was unwilling to not address quite severely." Tr. 23,738 (Arnold). He added that "there is no question in my mind that the assignment represented a demotion and I would certainly think there is no question in Mr. VV's mind or in the rest of the organization's mind that that was a demotion." Tr. 23,772 (Arnold). Mr. Arnold expressed the view that a disciplinary action against an individual had two purposes: to provide instruction to the individual and to provide instruction to the rest of the organization. Tr. 23,620-621 (Arnold).

232. At the time when these decisions were being made, VV was not told that he was being reassigned for disciplinary reasons. Tr. 23,775-776 (Arnold). There is no documentation anywhere in the Licensee's records to show that the reassignment was disciplinary, or that it was connected with VV's performance in the training program. See, e.g., TMIA Ex. 53, 54, 62, 66, 71, 72. The only written record of VV's reassignment characterizes it as temporary and as motivated by the valuable contribution which VV could make to the Accident Investigation Documentation Group. TMIA Ex. 54. When VV testified, he stated that he did *not* consider it as a demotion, but as a lateral transfer. Tr. 26,642(VV). It also appeared that VV's fellow employees were unaware of any demotion. When W was asked about the incident involving VV and O, he said that the incident was not common knowledge among the operators at Unit 1; he also said that he did not know what position VV now holds. Tr. 26,135(W). U was also asked about it. He revealed that he had no specific knowledge of the incident before the cheating scandal broke, and did not know to what position VV had been reassigned. Tr. 26,818(U). V had never heard of the incident either, until the cheating scandal broke in August of 1981. Tr. 26,310(V). On the witness stand, VV clearly denied that the company's motive in reassigning him was to provide an example to others. He said that the cheating incident:

was not the motivation, I am sure, that prompted my superiors to act . . . it was never publicized per se, and in fact, the majority of the people at the plant do not know about this incident, and that is one reason why I have asked for the in camera session.

Tr. 26,675(VV). From this testimony, it is apparent that neither VV nor his fellow employees had the impression that VV's reassignment was disciplinary, or connected to VV's training requirements.

233. The next question for the Licensee was whether to recertify VV as eligible to retain his license as a Senior Reactor Operator. In order for VV's license to be renewed, it was necessary for him to have satisfied his training requirements, and for the Licensee to so certify to the NRC. On August 3, 1979 Mr. Miller sent to Mr. Paul Collins, of the NRC, a letter

which stated, first, that in the 1978-1979 requalification year, VV had become deficient in four examination sections; second, that he had been retested in those four sections; third, that he had passed two of them with grades of higher than 80%; fourth, that he had entered an accelerated requalification program with respect to the two sections upon which he had received less than 80%; and fifth, that at the end of the requalification program he scored 99.8% on those two sections. TMIA Ex. 74. The letter did *not* mention that VV had submitted O's work when VV was "retested" on the four sections. *Id.* Also, the letter gave VV credit for a score of 89.1 (a passing grade) on the section which had been partially completed by O. *Id.*; Staff Ex. 26, Encl. 1. The letter certified VV as "satisfactory" based upon these scores. Before this letter was sent to NRC, it was approved by Mr. Herbein, who was Mr. Miller's superior. TMIA Ex. 73, 74.

234. It is obvious from the above that the Licensee was not candid with Mr. Collins. The Licensee admits that Mr. Collins should have been told about the handwriting. *Licensee's Proposed Findings* at ¶1319. To be eligible for renewal, a licenseholder is required to have competently performed his licensed duties. Crocker, ff. Tr. 25,081 at 4; 10 CFR 55.33(a)(5). Mr. Miller knew that the handwriting incident was highly relevant to judging VV's performance; Mr. Miller should have provided that information so the NRC could consider it. Mr. Crocker, of the NRC staff, testified that VV should not have been certified for renewal. Crocker, *id.* Mr. Crocker reasoned that if the Licensee in fact intended to remove VV from licensed duties then the Licensee did not have a continued need for VV's license, so renewal would violate 10 CFR §55.33(c)(3), which requires that there be a continued need. On the other hand, if the Licensee planned to retain VV in licensed duties, "involvement in the cheating incident certainly would cast doubt upon how competently VV had discharged his duties." *Id.*

235. The Licensee's letter to Mr. Collins also stated that VV had actually scored 89.1 on the section which had been partially answered by O. This statement was not true, and Mr. Miller knew it was not true. Mr. Miller's testimony that VV was later given an oral quiz on the material of that section (see ¶230 above), to make sure he knew it, does not make the statement true. Apparently, the intention behind the statement was not to certify someone as competent on that section who was not—if one believes that VV was in fact tested orally. Instead, the decision to report this score as if VV had earned it himself must have had some other purpose. The only purpose which I can discern was to conceal the fact that VV, who was a member of Licensee's management, had been guilty of wrongdoing.

236. In view of the total evidence on cheating by VV and O, what should one conclude about the Licensee's response? First, with respect to O, the Licensee decided to take no disciplinary action. As stated above,

the evidence shows that O must have known the purpose for which he supplied the answers to VV. The Licensee warned O not to engage in such behavior again (Miller, ff. Tr. 24,358 at 5) but the warning was insufficient; O later furnished answers to W on the NRC examination in 1981. Under the circumstances, however, I believe it was reasonable for the Licensee to refrain from any stronger sanction; O's status as VV's subordinate made it very difficult for O to refuse VV's request. It was not, however, reasonable for the Licensee to contend that O did not know the purpose of VV's request. Second, the Licensee responded to VV. The Licensee reassigned VV to nonlicensed duties, but did not notify either VV or his fellow operators that the reassignment was connected with cheating, or was a demotion. Mr. Arnold testified that VV had previously made statements embarrassing to the company (Tr. 23,733 (Arnold)) and that the reassignment was caused by a combination of factors. Tr. 23,871 (Arnold). Among those factors, O's handwriting on the examination does not appear to have been important. In Mr. Miller's memorandum to Mr. Herbein on July 3, when VV's conduct was being considered, Mr. Miller mentioned the handwriting, but emphasized the inadequate examination scores, the need to comply with the regulation requiring VV to be assigned to special training, and the fact that "we need his (VV's) license." The only action proposed on the handwriting was in a note at the end of the memorandum. It said: "If the exam which is not in proper hand script develops to a problem I will have an additional problem and will get to you." TMIA Ex. 62. From this, and the fact that the examination was graded and the scores attributed to VV, it appears that the handwriting was not of great concern to the Licensee in its decision to reassign VV.

237. The overall conclusion on VV and O must be as follows: first, the decision not to discipline O was unfortunate in view of what O did later but understandable in view of O's position as a subordinate; second, there was no statement to either VV or the Licensee's organization that VV's reassignment was connected to cheating on the FSR examination—Mr. Arnold's testimony to the contrary was unsupported by documentation, and was refuted by the testimony of VV and the other operators; third, the weight of the evidence shows that there was little connection in fact between the reassignment and the cheating; fourth, management's failure to disclose the cheating to the NRC was deliberate, improper, and resulted in a false statement in the letter upon which NRC relied in renewing VV's license. With respect to its obligations to the NRC, the Licensee's response to this incident was clearly inadequate. With respect to its obligation to its own employees, the Licensee failed to declare a clear policy against what VV did. If the Licensee had declared such a policy, the Licensee might have prevented the cheating which occurred later on the weekly quizzes and the NRC examination.

D. THE LICENSEE'S TRAINING AND TESTING PROGRAM

238. The Licensee's training and testing program has several purposes. It must train persons who begin at the entry level of auxiliary operators; it must train auxiliary operators who wish to become licensed reactor operators; it must train reactor operators who wish to become senior reactor operators; and it must train all licensed operators for their periodic requalification examinations. P.I.D. ¶¶ 174-195. After the accident at TMI-2, the Commission imposed an additional requirement for training at TMI-1. The Commission ordered that all TMI-1 operators be retrained "in the areas of natural circulation and small break loss of coolant accidents . . . and the TMI-2 accident." See ¶1, above. The Commission also ordered the Licensee to "conduct a 100 percent reexamination of all operators in these areas." *Id.*

239. In response to the Commission's order, the Licensee conducted a special, one time training program for all its licensed operators. P.I.D. ¶¶ 196-204, 260. The program was entitled "Operator Accelerated Retraining Program" (OARP); it covered the topics required by the Commission and it lasted from August of 1979 to March of 1980. *Id.* In April of 1980, at the conclusion of the program, the participants sat for an examination prepared by an independent consulting firm, PQS, headed by Mr. Frank Kelly. *Id.* This examination was known as the "Kelly" examination. It included a special category ("Category T") designed to cover "lessons learned" from the TMI-2 accident. P.I.D. ¶260. The Kelly examination also happened to serve as the Licensee's annual requalification examination. *Id.* After hearing extensive evidence on the OARP and the Kelly examination, the Licensing Board found that they satisfied the requirements for retraining and retesting which the Commission had laid down in its Order. *Id.* at ¶264. However, the Board also ruled that it would retain jurisdiction to reconsider that finding in light of evidence which might be developed subsequently on cheating. *Id.* at ¶¶ 43-45.

240. The Licensee's training program was administered in weekly segments. The participants attended lectures for one week, and then took a quiz on Friday afternoon which covered the materials taught during that week. See ¶¶ 68-72, above; Tr. 24,514-515 (J. Wilson). There was some testimony that the OARP was administered slightly differently, because instructors from outside TMI gave their quizzes at the end of their lectures and took their quizzes with them when they left the site. Tr. 26,233(O). However, the weekly segment with a quiz on Friday was the usual format. This format was used for the candidates who had failed the Category T portion of the Kelly examination. See, e.g., Lic. Ex. 66E, 66F. These candidates were required to show proficiency on Category T by the

Commission's Order, so the training department included Category T in the weekly format with the quiz on Friday afternoon. *Id.*

241. The Licensee admits that the administration of its weekly quizzes was "very loose." *Lic. Proposed Findings* ¶325. The Licensee also admits that "proctoring varied widely" (*id.* at ¶327), that there was no procedure for safeguarding examination materials (*id.*), that operators "could have harbored a misunderstanding as to whether they were required to do their own work" (*id.* at ¶328), and that "cooperation on quizzes certainly occurred at times" (*id.* at ¶329). And the Licensee admits that "instructors permitted cooperation on quizzes on occasions" (*id.*), that permitting cooperation "is improper as a means of verifying operators' understanding of the subject matter" (*id.* at ¶333) and that the "Licensee did not give sufficient attention to preserving the integrity of its training and testing program" (*id.*). These admissions were clearly warranted by the evidence, which is summarized above in ¶¶ 68-72.

242. Because memorization was an issue with respect to cheating, there was considerable evidence on the method of instruction used in the training program. The most detailed testimony was given by G and H. Their evidence started with the question on "natural circulation." H was asked on the witness stand to state the conditions for natural circulation. He could not; in response to specific questions, he said that it was irrelevant whether the heat sink was above the heat source or below it. See ¶31, above. H had received repeated instruction on natural circulation and the lessons learned from the TMI-2 accident. He received that instruction in the program leading up to the Kelly examination in April, 1980, and he attended at least three separate weekly training sessions at the end of which he took make-up examinations on Category T. *Lic. Ex. 64*. The fact that the training program failed to teach H such a simple and important concept is quite remarkable. H told Mr. John Wilson that the question "required a lot of straight memorization." *TMIA Ex. 75 at 2*.

243. G and H also testified about their understanding of pressure gauges. On the quiz of November 26, 1980, they both gave wrong answers to a question which asked them to name the instrument used to measure narrow range pressure. See ¶¶ 40-43, above. G named "forced balance rosemont" and H named "force balance." *Id.* The correct answer was the "Rosemount transmitter," which does not use a forced balance principle. On the quiz of March 27, 1981 they were again asked the same question. *Id.* They had to be reexamined on this subject because they had failed the quiz on November 26, 1980. This time G named "Rosemount," which was the right answer, but H missed the question again. *Id.* On the witness stand G asked to explain his answer. He said that "Rosemount is a trade name for forced balance." *Id.* After further questioning it became obvious

that G still did not know the device, or how it operated. *Id.* H was then asked to explain his answer of "Rosemont forced balance." He could not do so either. H said: "The wording really does not make that much sense to me, because I do not work with a transmitter . . ." *Id.* G and H each attended at least two training sessions on this device, and H was marked wrong both times on the weekly quiz. *Id.* This example shows that the training program did not succeed in actually teaching materials in which G and H had shown they were weak. Instead, G and H appear simply to have memorized word formulas with no understanding of what the formulas stood for.

244. The testimony of G and H on the generation of hydrogen gas was similar to their testimony on pressure gauges. On the quiz of November 26, 1980, G and H were asked to explain "how hydrogen gas is generated . . . following a LOCA." See ¶¶ 44-48, above. G and H both said: "From aluminum, zirconium water reaction," which was a wrong answer. *Id.* The correct answer was that hydrogen is generated from two separate reactions; one between sodium hydroxide and aluminum; the other between zirconium and water. *Id.* G and H were asked the same question again on March 27, 1981. This time they responded: "From sodium hydroxide, zirconium water reaction," which was wrong again. *Id.* They explained these latter responses on the ground that the grader, when marking their quiz on November, had written "NaOH" next to their answers. *Id.* They said they were shown their November quiz before they took the one in March, and they assumed, because of the grader's markings, that "NaOH" was the right answer. *Id.* This testimony shows that they never learned the reactions at all. If they had any knowledge whatever of the reactions they could not have answered as they did the second time. After G and H had answered incorrectly the first time, and showed they did not understand the reaction, a credible teaching process would have taught them the reactions. Instead, G and H were simply given a copy of their previous quiz with markings on it. *Id.* Apparently, G and H were expected to memorize the markings and respond to the second quiz on that basis. This may be a way to have G and H pass the quiz, and technically satisfy the Commission's Order on Category T; however, it shows a definite lack of interest in the operators' actual knowledge.

245. The above testimony of G and H reveals very poor instruction. The training program, from one session to the next, did *not* attempt to teach either G or H materials in which they had shown that they were weak. Instead, the program appeared to rely simply upon memorization. H's examination answer on natural circulation did not match any concept which H actually understood. The same is true of the answer by G and H on pressure gauges, and the answers by G and H on hydrogen generation. G and H knew words, but not what the words meant.

246. The training department also had another disturbing practice on Category T. On the make-up examinations it repeated the same questions week after week. A total of 14 operators were required to take a make-up examination in order to pass Category T. Lic. Ex. 64. The training department gave the first round of these make-ups over a period of five weeks in November and December, 1981. Lic. Ex. 70A-70E. This was done by including in each of the Friday afternoon quizzes a section on Category T. *Id.*; Lic. Ex. 67B-67F. The same questions were repeated verbatim from week to week with only minor variations. Lic. Ex. 67B-67F. After this first round of make-ups had been completed, it was still necessary to give a second round because some operators had failed the first round or had not taken it. Lic. Ex. 64. The second round was given on March 27, 1981. Lic. Ex. 65, 67G. It repeated verbatim the questions from the first round. *Id.* Mr. Brown admitted that this was "not a good practice." Tr. 24,806-807 (Brown). The second round was also a take-home examination (*id.*) and therefore was unproctored. Lic. Ex. 65, 67G. Furthermore, G and H were shown their papers from the first round shortly before they took the second. See ¶45, above. Notwithstanding all this, G and H failed the second round also. Lic. Ex. 64. From this pattern one must conclude that the training department did not take seriously the Licensee's obligation to teach the subjects required by Commission's Order, and that the operators did not take seriously their obligation to learn it. This conclusion is reinforced by the opinion of Mr. Paul Collins, who told the Licensee that, based on the results of the NRC examination in April of 1981, there were a number of operators who still did not understand the meaning of TMI-2. Tr. 24,815 (Newton).

247. Before discussing the operators' attitude toward the training program, an observation should be made about the type of questions which were asked on the weekly quizzes. If one looks back over the testimony by G and H, one discovers that the operators were examined on many questions which had little to do with their ability to operate the reactor. For example, the operators were asked to "list two major areas of weakness noted by the Lessons Learned Task Force." See ¶33, above. The answer to the question required one to simply memorize a list of abstract word formulations. *Id.* The question on pressure gauges was similar in its requirement for memorization. The fact of which gauge measures which pressure may conceivably be important if the gauge breaks down; however, it is not obvious why an operator would have to know how such a gauge is designed in order to read, from a dial in the control room, the signal which the gauge transmits. See ¶¶ 40-43, above. The question on Bernoulli's equation falls into the same pattern. The equation describes important physical relationships but the value of an operator's knowing such an equation would consist in his being able to use it, not in his having

memorized a long definition of it in words. See ¶¶ 58-66, above. S and Y were asked to “describe how the ATOG program proposes to simplify the operator’s problem of identifying and reacting to (treating) abnormal transients.” See ¶78, above. S and Y answered, correctly, “By developing symptom oriented guidelines.” *Id.* This is another abstract formulation to which they both said they memorized the abstract answer. *Id.* The technical adequacy of the Licensee’s training program was not directly in issue at the hearing. However, the nature of many of the questions, and their slight relation to the operators’ needs, may explain why memorization was used to answer the questions, and why many of the operators did not respect the training program. Both G (Tr. 25,745) and Mr. Shipman (Tr. 26,404-405) commented specifically on the lack of relevance of the questions.

248. Several operators gave their opinion of the training program. The most striking example of disrespect came from VV, a member of management who ignored the program for as long as he could, and then turned in as his own work answers obviously written by someone else. See ¶¶ 220-237, above. Mr. I, a shift supervisor, expressed to the NRC investigators his opinion that O and W “must have felt compelled to cheat either because they were not prepared, or because they felt they were not prepared.” Staff Ex. 27 at Encl. 9. When asked on the witness stand to explain those remarks, he said: “I felt the training program could have been better.” Tr. 26,543(I). Mr. Shipman, who repeatedly failed the Category T make-up examinations (Lic. Ex. 64) said that: “The Category T exams that I had previously taken I do not believe reflected the real significant or more important lessons learned . . . I did not take them very serious, as far as my performing — my capacity to perform as a licensed operator.” Tr. 26,404-405 (Shipman). Mr. Shipman also said that his “attitude about the Category T exam was prevalent.” Tr. 26,406 (Shipman). In response to a question about the third round make-up on Category T, which he passed, Mr. Shipman said: “I think the sense of the question is did I just memorized a couple of things to put down on the exam, and I believe that that is what I did to get through that test.” Tr. 26,407 (Shipman). A, however, testified that the training program leading up to the NRC examination “was probably one of the best that we had set up” Tr. 26,049(A). HH, also, said the program was worthwhile and that it helped him in his work. Tr. 25,859(HH). GG, though, said that the training program was not adequate to prepare a person for the NRC examination. Tr. 25,703-704(GG). On balance, the evidence showed that many of the operators did not have confidence in the training program.

249. The Licensee’s final effort to satisfy the requirement for Category T was to re-instruct and re-examine all the operators who had not passed the examination originally given by Mr. Kelly. Brown, ff. Tr. 24,695 at 1.

This was necessary because of the evidence of collusion on the make-ups taken during the weekly quizzes. Arnold, ff. Tr. 23-590 at 8. This fourth make-up was given on November 2 and November 6, 1981. Brown, supra, at 1. On each of these two days Mr. Nelson Brown conducted a review session of about 3 ½ hours. *Id.* After the review, a one-hour study session was provided, and then the examination was given. *Id.* The examination was fully proctored. Tr. 24,653 (Brown). About half of the candidates participated in the first session and the remainder participated in the second. *Id.* The same questions were repeated on both days (Lic. Ex. 69A; Tr. 24,822 (Newton)) but the examination was safeguarded in the meantime (Tr. 24,822 (Newton)). H testified that the teaching method used in the fourth-round make-up was the same as that used earlier in the third round make-up session. Tr. 25,907(H). H said the information was well broken down (Tr. 25,906(H)) and that he understood it then for the first time (Tr. 25,907(H)). H said that he was encouraged to memorize the material and that he felt confident he would pass. Tr. 25,905(H). G testified that the fourth-round make-up was more relevant to the lessons learned from TMI-2. Tr. 25,746(G). G added, however, that "everything that was asked on the test for all practical purposes was also gone over the morning before the test . . . they just took 20 questions, about, of the contents of what they had lectured us on . . ." Tr. 25,746(G). From this testimony, it appears that the Licensee's reliance upon memorization has continued. The sessions in November were effective in having the candidates pass a test, and that test contained questions on the subjects required by the Commission. However, it is doubtful whether a half-day course can produce true understanding. One would expect more careful treatment of a subject specially required by the Commission.

250. In response to the cheating incident, the Licensee has adopted new procedures for testing. The new procedures require that examinations be secured, that examinees be told whether the examination is open or closed book, that examinations be proctored, that seating charts be made for major examinations, and so forth. Lic. Ex. 73; Long, ff. Tr. 24,925 at 25-26. If these new procedures are followed the administration of testing at TMI-1 should improve. One should keep in mind, however, the fact that the Licensee adopted new training procedures once before. After the accident at TMI-2, the Licensee assured the Licensing Board that its new training program would overcome the deficiencies in training which had existed before the accident. P.I.D. ¶¶ 182-199, 205. Also, in 1979, Mr. Miller, as a result of the incident with VV and O, recommended steps to "review and upgrade the requalification program and procedures," and he said that "with the advent of the OARP which began at about this time . . . I was confident that my recommendations would be carried out." Miller, ff. Tr. 24,358 at 6. According to U, however, the pattern of loose

quiz administration continued after the accident, and throughout the OARP. See ¶70, above. V said the pattern of cooperation on weekly quizzes continued until August of 1981, when the cheating by O and W was discovered. See ¶71, above. GG testified that the casual attitude toward taking the quizzes still existed during the Category T make-ups. Tr. 25,695-696(GG). Thus, poor test administration followed the Licensee's post-TMI-2 assurances. The Licensee's latest assurances must be viewed with that record in mind.

251. My overall conclusions on the Licensee's training and testing program are as follows. First, the administration of the testing program was clearly inadequate. The weekly quizzes were not proctored on any regular basis. Mr. Husted, a training instructor, testified that the left weekly quizzes unproctored about 50% of the time. See ¶68, above. Operators cooperated on the quizzes, and it was unclear whether they were supposed to do their own work. See ¶¶ 69-71, above. Second, the method of instruction emphasized the memorization of word formulas, rather than an understanding of the concepts which the formulas stood for. Operators were taught words without being taught what the words meant. Third, when operators showed that they were weak in a given area there was no apparent effort to actually teach them the materials in that area. On the second round of the Category T make-ups, for example, instead of actually teaching the operators the subject matter, the questions were simply repeated from the first round, the operators were shown their first round tests, and then left to answer the second round on a take-home basis. Fourth, many of the questions on the quizzes were unrelated to the candidates' ability to operate the reactor. This encouraged memorization and diminished the operators' respect for the training program. In sum, the Licensee's training program was poorly administered and, judging from the evidence presented before me, it was weak in content and ineffective in its method of instruction. I do not believe that the Licensee's training program responded adequately to the Commission's Order of August 9, 1979.

E. THE LICENSEE'S SYSTEM FOR CERTIFYING CANDIDATES

252. Under the Commission's regulations, facility licensees must certify as competent all operator candidates seeking to renew their licenses (10 CFR §55.33) or obtain new licenses (10 CFR §55.10). In the case of a renewal, licensees are required to certify that the operator candidate has satisfactorily completed the requalification program (§55.33(a)(5)). The Licensee's certification of VV in 1979 has already been discussed in ¶¶ 220-237, above.

253. At the time of the NRC examination in 1981, the Licensee had no formal certification procedure. Hukill, ff. Tr. 23,913 at 18; Ross, ff. Tr. 24,127 at 7. In order to decide which candidates to certify, the Licensee relied upon a long meeting, in attendance at which were Mr. Hukill, Mr. Herbein (Vice President of Nuclear Assurance), Mr. Toole, Mr. Ross, Dr. Knief (Manager of Training), Mr. Newton, and Mr. Brown. Hukill, *id.*, at 19-20. During this meeting, these persons evaluated each candidate according to the following criteria: the candidate's score on the ATTS examination, the candidate's performance during the training program over the preceding year, and the performance of the candidate on the job. Hukill, *id.*, at 20. All the candidates were certified. *Id.*

254. At the time the Licensee made this certification, O and W had already cheated on the ATTS examination. Staff Ex. 26 at 17. Fourteen persons took the same ATTS RO examination as O and W; twelve took the same SRO examination. *Id.* The NRC investigators found that O and W gave obviously similar answers to ten of the thirty-seven essay-style questions on the SRO examination. *Id.* However, the Licensee failed to detect these similarities. Newton, Brown, ff. Tr. 24,640 at 10. This failure was caused by the fact that all the ATTS examinations (there were 56) were graded quickly over one weekend "in rather rote fashion." *Id.* The ATTS examination was not fully proctored (*id.*) and the proctor was inattentive (Tr. 26,084-085(W)). Thus, the Licensee's system of certification approved two operators who had cheated on one of the examinations used as a basis for the certification.

255. The Licensee also certified several operators who did poorly on the ATTS examination. R obtained a score of 15.4% in one category and less than the 70% passing grade in two other categories. Aamodt Ex. 9. H obtained less than 70% in six of eight categories. *Id.* G was deficient in two categories; S in four. *Id.* R, H, and G were assigned to their shift supervisors (R was assigned to O) for intensive "cramming" during the week or so which remained before the NRC examination. Tr. 24,760-761 (Newton). S, who was himself a shift supervisor, was assigned to Mr. Boltz, a training instructor, for the same purpose. *Id.* at 24,762.

256. With respect to the candidates' performance in the weekly training program, Mr. Hukill relied upon data from Mr. Brown. Tr. 24,105 (Hukill). This data was not always reliable. For example, Mr. Brown certified to Mr. Hukill that H had fulfilled all the training requirements when this was not the case. *Id.* H was required to make up a category he had failed on the 1979-80 annual requalification examination but the quiz he took to make up that category was not graded on the answer sheet at the time of Mr. Brown's certification to Mr. Hukill; when it was graded H received a failing score of 68.2%. Tr. 24,780-781 (Milhollin, Brown). Mr. Brown said that he had certified H without computing H's grade because

the equations H used appeared correct "at first glance." Tr. 24,781 (Brown). H's use of those equations in fact provided wrong answers. *Id.* H's performance on the weekly quizzes — as well as G's performance — is discussed above. See ¶¶ 26-67. These quizzes were very poorly administered. See ¶¶ 68-73, above.

257. The evidence here shows that the Licensee's system of certification was unreliable at the time of the NRC examination in April. The grading of the ATTS examination was not adequate to detect obvious copying, and that examination was not fully proctored. The data from the weekly training program did not always reflect actual grades (in the case of H's make-up quiz) and the data from the weekly quizzes suffered from the uncertainty caused by the poor administration of those quizzes.

258. Mr. Hukill admitted that the Licensee "can be legitimately criticized for not formalizing our certification process by establishing a written certification procedure." Hukill, ff. Tr. 23,913 at 18. However, he also said that he intended to establish such a procedure before certifying the next group of candidates. *Id.* That procedure would include signed statements from training personnel certifying that the operators had completed their training requirements. Tr. 24,053 (Hukill).

259. My conclusions on the Licensee's certification process are as follows: First, the Licensee should not have certified O and W; their copying on the SRO portion of the ATTS examination was obvious enough to have been detected through careful grading. Second, the data from the weekly training program was unreliable because it was not verified by the training instructors, and also because it was taken from the weekly quizzes, which were poorly administered. Beyond that, the Licensee's certification process appears to have been adequate. The evidence on this subject was insufficient to warrant any findings other than the brief ones just stated.

F. THE NRC EXAMINATION

Proctoring and grading the examination

260. The NRC examinations in April, 1981 were given on four successive days. See ¶139, above. The candidates for all the examinations were divided into two groups: one in the smokers' room, one in the non-smokers' room. B. Wilson, ff. Tr. 25,481 at 2; Tr. 25,557-558 (B. Wilson). On April 21, the RO "A" examination was given; it lasted nine hours. B. Wilson, ff. Tr. 25,481 at 2. The smokers' room was proctored by Mr. Maines for the entire nine hours, except for lunch, when he was relieved by Mr. Young, the NRC Resident Inspector. Tr. 25,556-557 (B. Wilson).

Thus, that room was fully proctored on April 21. The non-smokers' room was proctored by Mr. Bruce Wilson. Mr. Wilson was relieved during lunch, also by Mr. Young (*id.* at Tr. 25,500), but Mr. Wilson was not relieved during the approximately one and one half hours he spent reviewing the examination with the TMI reviewers. *Id.* at Tr. 25,558. Thus, the non-smokers' room was left unproctored for one and one half of the nine hours on April 21. *Id.*

261. On April 22, the SRO "A" examination was given. It lasted for seven hours. B. Wilson, ff. Tr. 25,481 at 2. Mr. Maines again proctored the smokers' room, and was relieved again by Mr. Young for lunch, so the smokers' room was fully proctored for seven hours on April 22. Tr. 25,556-557 (B. Wilson). Mr. Wilson again proctored the non-smokers' room and again left it unproctored for one and one half hours while he reviewed the examination with the TMI reviewers. *Id.* at Tr. 25,557-558. So the non-smokers' room was left unproctored for one and one half hours on April 22.

262. On April 23, the RO "B" examination was given; it lasted for nine hours. *Id.* at 25,558. Mr. Wilson proctored the smokers' room for two or three of the nine hours. During the rest of that time, he was reviewing the examination with the TMI reviewers. *Id.* at 25,559. Thus, the smokers' room was left unproctored for six or seven of the nine hours on April 23. Mr. Maines proctored the non-smokers' room for approximately seven of the nine hours. *Id.* at Tr. 25,584. He was absent from the facility for about two hours for a health physics indoctrination and a whole body count in preparation for a site tour he was to take. *Id.* Thus, the non-smokers' room was left unproctored for about two of the nine hours on April 23.

263. On April 24, the SRO "B" examination was given; it lasted for seven hours. B. Wilson, ff. Tr. 25,481 at 2. Mr. Wilson did not proctor the smokers' room on that day except to enter it from time to time, so it remained essentially unproctored on April 24. Tr. 25,559 (B. Wilson). Mr. Maines proctored the non-smokers' room from 8:00 a.m. until about 11:30 a.m. when he left the facility to go on a plant tour. *Id.* at Tr. 25,584. That room was left unproctored from 11:30 a.m. until about 1:30 p.m. except for brief periods when Mr. Wilson checked it. *Id.* Mr. Wilson began to proctor the room at about 1:30 p.m. and proctored it until the end of the examination. *Id.* at Tr. 25,584-585. Thus, the non-smokers' room was left unproctored for about two of the seven hours on April 24.

264. There was also evidence that the proctors were not attentive while proctoring. G testified that the proctor of the non-smokers' room read a soft cover book. Tr. 25,765(G). O and W cheated rather openly while the proctor was present. See ¶¶ 13-14, above. O and W were in the non-smokers' room during the "B" examinations on April 23 and 24. Mr.

Maines proctored that room for seven of the nine hours on April 23 and Mr. Maines and Mr. Wilson proctored it for five of the seven hours on April 24. An attentive proctor would, at the least, have asked O to turn his answer sheets face down on the table, or to move them were W could not see or reach them.

265. The candidates were seated at tables eight feet long, two candidates to a table, facing the proctor. Lic. Ex. 83; TMIA Ex. 61. The tables were four or five feet apart. Tr. 25,850(HH). U brought his briefcase into the examination and had access to it during the examination. Tr. 26,840-841(U). There was no effort to inspect items such as briefcases. Tr. 25,560 (B. Wilson). Although Mr. Collins stated that the "B" set of examinations was so similar to the "A" that a person taking "B" would have had an unfair advantage by seeing "A" (Tr. 25,146-147 (Collins)) the candidates who had taken "A" were not instructed to refrain from discussing "A" with the candidates scheduled to take "B". Tr. 25,582 (B. Wilson). Mr. Husted appears to have discussed "A" with the "B" candidates. See ¶114, above. Candidates who had finished their examinations could remain in the hall near the examination room, where they would be accessible to candidates on a coffee break who were still taking the examination. Tr. 25,580 (B. Wilson). There was no limit on the time during which a candidate could be absent from the examination room. Tr. 25,423 (Ward). Mr. Wilson testified that these proctoring practices were consistent with the established practice of the NRC Staff. Staff Ex. 24.

266. At the hearing, the NRC Staff took the position that its procedures during the April examination had been adequate, Mr. Paul Collins, Chief Operator Licensing Branch, testified that he did "not believe that the procedures used by the staff to administer the April 1981 exams demonstrated any type of laxity on the part of the staff." Collins, ff. Tr. 25,109 at 6. In view of the evidence just set forth, I cannot agree with Mr. Collins. The risks of allowing an examination to go unproctored are obvious, and proctors can be hired with ease. In this case, the absence of proctoring was combined with inattentive proctoring, close seating, opportunities to receive answers in the hall (see ¶119, above) and access to briefcases. I must conclude that the Staff was lax and that its procedures were inadequate.

267. The grading of the NRC examination was also in issue. The cheating by O and W was discovered by Mr. Monte Davis, who had been hired by the NRC Staff as a consultant to grade twelve "A" and eight "B" SRO examinations. Staff Ex. 24; Collins, ff. Tr. 25,109 at 4. Mr. Davis noticed the cheating during his grading and he provided a list of O's and W's similar answers to Mr. Collins. Staff Ex. 24. Mr. Davis said there were so many similarities that he "got tired of comparing." *Id.* In addition to cheating on the SRO "B" examination, O and W also cheated on the

RO "B" examination. There were seventeen of those examinations and they were all graded by Mr. Collins. Collins, ff. Tr. 25,109 at 4-5. Mr. Collins did not detect the cheating. Mr. Collins said he did not detect it because of the large number of examinations to be graded, because roughly half of the questions required short, rather than long answers (longer, essay-type answers make it easier to detect cheating) and because he "was under a tight schedule and graded the examinations rapidly." Collins, *id.* at 5. If one reviews the answers by O and W which are quoted in paragraph 12, above, one can see that O and W gave long, essay-type answers to Question A.6(a) on the RO examination. These answers show obvious copying. On Question H.3(a), which is also quoted in paragraph 12 above, O and W also gave long, essay-type responses which show obvious copying. These answers are only examples of the many similar essay-style answers by O and W on the RO "B" examination. Special Master's Ex. 1, 2; Staff Ex. 24. The proportion of obviously similar answers by O and W on the SRO examination was higher than on the RO examination. Staff Ex. 26 at 14. However, the number and nature of the similar answers on the RO examination are such that the cheating should have been discovered, despite the greater number of "B" papers which Mr. Collins graded. The Office of Inspection and Auditor listed obvious similarities on the answers to Questions A.6.a, A.7.a, B.3.a, C.3.a, C.3.b, C.3.c, C.4.a, D.3, E.4.a, E.6.c, F.1.a, F.5.c, and H.3. Staff Ex. 24. To that list I would add the answers to several other questions. The Office of Inspection and Enforcement identified "at least 17." Staff Ex. 26 at 14. The sheer number of these similar answers (several of which are wrong) made the cheating obvious.

268. In response to the cheating, the Staff has adopted new procedures. These require 100% proctoring, admonitions against cheating, that the facility furnish a single room large enough for adequate spacing of candidates, that all reference materials and answer paper be furnished by the NRC examiner, and that examinees who have completed the examination must leave the area in which the examination is given. B. Wilson, ff. Tr. 24,481 at 4-5; Staff Ex. 30. The new procedures also require a new form of grading to check for copying. An NRC reviewer must "review in detail the answers and grades assigned for at least one question in 50% of the categories for 50% of the applicants." Staff Ex. 25. These procedures were used during the NRC examinations given at TMI-1 in October of 1981. Tr. 25,129 (Collins). The NRC Staff hired four professors from Pennsylvania State University to provide 100% proctoring. Collins, ff. Tr. 25,113 at 1-2. All the candidates took the examination in the same room. B. Wilson, ff. Tr. 25,481 at 4. Only one candidate was allowed to leave the examination room at a time and a log was made of absences. Collins, ff. Tr.

25,113 at 2. Candidates were admonished against cheating. *Id.* The grading of the October examination was reviewed according to the Staff's new procedure to detect cheating. *Id.* at 3.

Content of the examination

269. At TMI-1, the NRC Staff gave a written examination and an oral test to those operators who have been previously licensed. Staff Ex. 32. For those seeking their first license, the Staff also gave an examination on a simulator. *Id.* The content of these examinations was not expressly made an issue at the hearing; however, the nature of the questions on the written examination became an issue for the purpose of deciding whether the questions were amenable to cheating, rote memorization, or other devices which could defeat the examination's purpose. See ¶3, above. Also, the nature of the questions and their answers became important to the issue of broadening the answer keys. See ¶¶ 153-178, above. Finally, the content of the examination is relevant in evaluating the operators' attitude toward it.

270. The evidence on broadening the answer keys provided the most specific example of the examination's content. Twelve questions were chosen for analysis. See ¶¶ 153-178, above. Question B.5.a was the first example considered. It asked for the purpose of the No. 1 seal by-pass line. See ¶154, above. The question sought to discover whether the operators knew how a particular piece of equipment — the seal by-pass line — functioned. The question was on a fact specific to the design of the plant, and the answer consisted of stating that fact. The only uncertainty arose when Mr. Wilson changed the answer key because of what the reviewers said was covered by the training program. Mr. Wilson apparently accepted two principles in his decision to change the key. First, that the answer should be governed by the training program rather than the design of the plant; and second, that the reviewers' word should be taken for what the training program covered. As indicated above, neither of these principles was valid.

271. The second example considered was Question B.5.c. It asked when a reactor coolant pump must be tripped due to high vibration. See ¶159, above. This question was similar to B.5.a, in the sense that it asked how a particular piece of equipment functioned, and sought to test the operators' knowledge of a specific aspect of plant design. The answer, again, was a specific fact — that the pump must be tripped at a certain vibration. The change in the key was required because the key was incomplete. Appar-

ently, the key was incomplete because the NRC examiner did not have all the necessary information. Tr. 25,604-606 (B. Wilson). The examiner depended upon the reviewers to supply this information. *Id.*

272. The third example was Question B.6.a. The question asked for the way in which the nuclear services river water system responds to a loss of offsite power with or without a loss of coolant accident. See ¶160, above. Again, the question sought to test the operators' knowledge of a specific aspect of plant design — how certain pumps respond to a certain signal. The answer was, again, a specific fact, consisting of which pumps start on which signal. The answer key to this question was rewritten because the NRC's original answer had been taken from the OARP without considering the Licensee's blackout procedure. *Id.* The NRC had all the relevant material, but appeared unaware of how it fit together. *Id.* The NRC examiner depended upon the Licensee for the correct answer to this question. *Id.*

273. The fourth example was Question C.2.b. This question asked for the competing chemical effects which determine primary pH. See ¶161, above. The question corresponds to the pattern of the previous examples. It asked for specific facts about the design of the plant, and the answer was to state those facts. The NRC reviewer resisted the reviewers' efforts to change the answer key on this question, and did so for good reason. See ¶¶ 164-166, above.

274. The fifth example was Question D.5. The question asked for a list of the sensors which initiate automatic action for certain abnormal conditions. See ¶167, above. This question was again similar to those above in the sense that it requested the operators to list specific facts about the plant design. On part "a" the answer was changed because the Licensee had supplied erroneous information to the NRC; the information in the OARP had indicated a design change, but the change had not in fact been made. See ¶168, above. On part "b" the original answer was incorrect, for reasons which were not made clear. *Id.* On part "c" the original answer was left blank because the NRC examiner had not been able to find an answer to it which was specific to TMI-1. *Id.* On part "d", the original answer was changed because the question was too vaguely worded. *Id.* Once again, the NRC examiner depended entirely upon the Licensee's reviewers for the answers to the question. *Id.*

275. From the five examples above, two patterns emerge. The first pattern reveals that the questions all test the same kind of knowledge. In each example, the question asked the operators to state specific facts about the design of the plant. The operators were asked to state the purpose of a by-pass line; to state when certain pumps trip or when certain other pumps start; to state certain chemical effects; and for a list of sensors. If one looks at the seven remaining questions which were chosen as examples, one

sees that this pattern continues. Operators were asked on Question E.3. to list a series of set points; on Question E.4. to describe devices for detecting leaks in the emergency cooling system; on Question F.2.a to list logs which must be reviewed; on Question F.5.c to state the conditions for throttling the high pressure injection system; on Question G.4. to state the formula for the production of Cobalt 60; on Question H.5.c to state the mathematical relation between the discharge head of a pump and its speed; and on Question N.5.a to state the design flow capacity of the high pressure injection pumps. See ¶¶ 169-175, above. All of these questions asked for very specific facts about the design of the plant. To grade such questions accurately, the NRC examiner must have reliable, specific information about the design, and he must understand that material. To answer such questions accurately, the operators must be taught reliable, specific information about the design, and the operators must commit that material to memory.

276. A second pattern also emerges from the five examples above. The second pattern reveals that the NRC examiner in fact relied upon the Licensee for answers to these questions. The examiner relied upon the Licensee for the answer to the question on the purpose of the seal by-pass line (which the examiner should not have done), for part of the answer to the question on tripping a reactor coolant pump, for all of the answer to the question on starting the nuclear services river water system, and for all of the answer to the question asking for a list of sensors. The examiner resisted the reviewers' suggestion only on the answer to the question about primary pH. If one looks at the seven other questions chosen as examples, one sees the same pattern. On Question E.3, which asked for a list of setpoints, the examiner relied upon the Licensee for all of the answer; on Question E.4., which asked for devices for detecting leaks in the reactor building emergency cooling system, the examiner relied upon the Licensee for a third device (in addition to the examiner's two); on Question F.2.a, which asked for the list of logs to be reviewed by the CRO coming on shift, the examiner relied upon the Licensee for a new list of logs to replace the examiner's list of logs; on Question F.5.c, which asked for the conditions for throttling high pressure injection, the examiner relied upon the Licensee for all of the answer, which the examiner had left blank; on Question G.4., which asked how Co60 is formed and why it is hazardous, the examiner relied upon the Licensee for an addition to the answer which was necessary to make the answer complete; on Question H.5.c, which asked for the relation between pump speed and discharge head, the examiner's original answer was erroneous and was contradicted by the reviewers' answer, which was right; and on question N.F.a, which asked for the design flow capacity of the high pressure injection pumps, the examiner relied upon the Licensee for all of the answer. The most striking

example of reliance occurred while Mr. Ross was taking the examination. Mr. Wilson called Mr. Ross out of the examination room to clarify question B.4., which was on the examination which Mr. Ross was taking. Mr. Wilson did so because Mr. Ross "was the only person available to explain how the particular valve worked." Tr. 25,548 (B. Wilson).

277. The reason for the examiner's reliance on the Licensee was not the same in all of these instances. In some of the instances the reliance was produced by the examiner's misinterpretation of the materials supplied by the Licensee, or by some failure by the examiner to make the question or the answer key complete. This appeared to be the case in examples three, eight and ten. In other instances, the reliance was produced by the Licensee's failure to supply information which was currently valid. This was true in examples two, five and twelve. In still other instances, the examiner left the answer key blank because he did not have the answer when he wrote the question (instances six and nine) or he changed the answer upon the assumption that he should make it correspond to what the reviewers said was covered in the training program (instance one). Mr. Wilson testified that the most frequent cause of change was the inadequacy of the materials he received from the Licensee. He said: ". . . the vast majority of changes were necessitated by the differences between the information that we received and what was actually taking place in the plant." Tr. 25,631-632 (B. Wilson). Mr. Wilson's view was corroborated by other testimony. Mr. Hukill testified that the Licensee's practice of making constant changes to the training materials had caused the operators to have a poor attitude toward the training program. Tr. 24,021-022 (Hukill). He also said that the Licensee's method of providing information to the operators lacked a device, such as a training manual, which would serve as an approved source of information and be kept up to date. *Id.* at 24,026. Mr. Ross said that the Licensee had not furnished NRC with materials which were up to date at the time of the NRC examination and said that the cause was the lack of a prescribed training manual. Tr. 24,243, 307 (Ross). This failure to provide adequate information to Mr. Wilson forced him to rely heavily upon the Licensee's reviewers. In fact, it placed him at their mercy in many of the examples considered above.

278. The first pattern described above, which was the practice of asking questions about specific details of plant design, also encouraged memorization. In the twelve examples cited, the information sought was so detailed that no operator could have supplied it without memorization. GG testified that the NRC examination in October for SRO was so devoted to numbers and design details that it was not a fair measure of his ability. Tr. 25,711(GG). G testified that the NRC was not "capable of understanding our right answer" because, on questions covering operating procedures, the examiner would take off points for leaving out things which were trivial.

Tr. 25,743(G). G said he did "not even regard it as worthwhile . . . putting down . . . an answer" (*id.* at 25,743-744) and that "for me to pass this test I have to cold memorize all the procedures, and I refuse to do that" (*id.* at 25,744). Mr. A testified that the NRC appeared to have constructed the April examination by lifting details from the OARP materials. He said: "They went down through the material that we gave them, and it appeared that they indiscriminately just went into a sentence or paragraph and picked out a statement and fashioned a question around that statement." Tr. 26,045(A). A also said that a good operator "might not have passed that exam because of the specific questions that were on it." Tr. 26,047(A). He said that a candidate with an exceptionally good memory, who was familiar with the particular materials tested, could have passed the examination despite an overall inability to operate the plant safely. *Id.* He added that the RO portion of the October examination was less devoted to detail than the April examination had been (Tr. 26,047-048(A)) but the SRO portion in October was still quite detailed (Tr. 26,053-054(A)). S told the NRC investigators that thirty-five to forty percent of the questions required memorized answers. Staff Ex. 26 at 31. T told Mr. Hukill that the examinations were "absolutely terrible, and in no way reflected whether an operator really knew how to operate the plant or not." Tr. 23,975 (Hukill). P told the NRC investigators that "most operators viewed the NRC examinations as just one more bureaucratic obstacle to be overcome and did not perceive them as having any relevance to their abilities to operate a plant safely." Staff Ex. 27 at 40. V testified that the April examination was not a fair measure of his ability. He said "there was quite a bit of esoteric information . . ." Tr. 26,320-321(V). He cited the example of a question which asked for the definition of "isochronous." Tr. 26,321(V). He said that the switch on Units 2's diesel had a position on it marked "isochronous," but that Unit 1's switch was marked "unit in parallel," so the question, in addition to being obscure, was irrelevant to Unit 1 and therefore technically wrong. *Id.* He said that about twenty percent of the questions were technically wrong. *Id.* He also said that the October examination was better than the one in April. *Id.* at 23,322(V). Mr. Shipman testified that the April examination "covered a very, very broad range of specific details, and . . . that type of information is readily available in the reference material available [in the control room] to all the operators." Tr. 26,411 (Shipman). Mr. I testified that the written examination "really does not find out how you function as an operator . . . basically it asks you questions on . . . [operating procedures] which you would always have available . . ." Tr. 25,585(I).

279. What can one conclude from the above evidence? Whether or not one accepts the operators' criticism as valid, it is obvious that there is a problem of credibility. At TMI, Mr. Wilson was in the position of asking

the operators about details which were difficult to remember and which the operators did not believe were important. At the same time, however, Mr. Wilson was forced to rely upon the operators themselves to supply those details. It is no surprise that the operators did not respect the examination.

280. The NRC also gave an oral test to the TMI-1 operators. This test consists of a four to six hour examination session for each candidate in which the candidate is examined alone by the examiner. Boger, ff. Tr. 25,480 at 7-12. The session begins in an office or conference room, in which the examiner asks the candidate about general reactor theory, radiation protection practices, reactor operation, and so forth. *Id.* The examiner and candidate then move to the control room, where the major portion of the test is conducted. *Id.* The candidate is asked questions about reading and interpreting the instruments and manipulating the controls. *Id.* The examiner also asks the candidate about emergency operation. *Id.* The examiner postulates the symptoms of an unusual condition and asks the candidate what actions are required by the facility's procedures. *Id.* The number of questions on postulated symptoms ranged from two to about six or eight at TMI-1. Tr. 25,540-541 (Boger). The final phase of the oral test is a tour of the plant, during which the candidate is asked about monitors and radiological safety practices. *Id.* Several operators testified that they were asked about abnormal operating conditions during the oral test. See, e.g., Tr. 26,411-412 (Shipman); Tr. 26,052-053(A).

281. There were also other issues at the hearing which touched upon the examination's content. The first was whether the questions on the written examination were repeated from one examination to the next. The evidence was inconclusive. Mr. A said that he had already seen about half of "the general type of questions" on the April examination. Tr. 26,042(A). Mr. Bruce Wilson testified that the number of old questions on the April examination was small. Tr. 25,585 (B. Wilson). However, he also said that NRC does "repeat questions to a fairly significant extent." *Id.* at Tr. 25,586. He said that NRC has written new performance appraisals for its examiners which require that examinations must be changed, from one to the next, by at least fifty percent. *Id.* Mr. Collins testified that his office had compared the October NRC examinations at TMI-1 to all examinations administered since April of 1981 at facilities similar to TMI; he said that less than 4% of the questions were similar. Collins, ff. Tr. 25,113 at 5. GG said that he had already seen about ten or twenty percent of the questions on the October examination. Tr. 25,700(GG). A second issue was whether candidates could be "coached" for the oral test. Since an examiner may administer up to six oral tests during an assignment, some coaching is anticipated. Boger, ff. Tr. 25,480 at 10-11. To minimize the impact of this coaching, the examiners vary the content of the test. *Id.* It

was unclear to what extent the examiners were successful in minimizing this impact at TMI-1. A third issue was the adequacy of the NRC Staff's review of the Licensee's examination on Category T. The Staff decided, apparently at the highest level, to have the Licensee administer this examination. Tr. 25,152 (Collins). The Operator Licensing Branch reviewed and approved the original Category T examination given by Mr. Kelly in April of 1980, but the Staff did not review the Category T make-up examinations (weekly quizzes). Tr. 25,635-636 (Boger). Thus, the Staff was unaware that the same questions on the make-up quizzes were repeated from week to week within the same round; that the same questions were repeated from one round to the next; that the second round was given as an unproctored take-home examination; and that the instruction was poor. See ¶¶ 241-247, above. The NRC staff did review and approve the final Category T make-up which the Licensee gave in November of 1981. Tr. 25,635 (Boger). However, the Staff apparently did not review the method by which it was taught and administered. This method consisted of a three to four hour review session in which the candidates memorized the lecture material and then immediately took an examination on what had been presented. See ¶249, above. This failure to follow Category T more closely does not seem consistent with the emphasis placed on Category T by the Commission. See ¶¶ 1, 26, 238, above. However, the Staff's decision on this matter may have been a product of its manpower shortage (see ¶285, below) and its view that the Category T materials were also covered on the NRC examination. Tr. 25,654 (Boger). This latter position is correct. If one compares the questions on the original Kelly examination on Category T to the NRC examination, one finds that the same subjects are covered in both.

282. The final issue touching the Operator Licensing Branch was its attitude. On October 2, 1981, I asked the NRC Staff to present evidence on the following question:

The Kemeny Commission found that operator training was greatly deficient; that the depth of understanding was far too shallow. It also found that the branch of NRC that monitored operator training was "weak and understaffed," and that NRC limited itself to "giving routine exams." It concluded that no quantity of "fixes" would cure the basic problem, which it found to be the attitude of the people who were involved. Because the cheating incident occurred after the Staff has responded to the Kemeny Commission and promised to improve, what does the possibility of laxity in the Staff's procedures indicate about the Staff's attitude?

The Staff's evidence was presented by Mr. Collins, Chief of the Operator Licensing Branch. He testified that Staff was not lax in its administration of the April examination, that the Staff's procedures were adequate, and that the Staff makes a sincere effort to insure, through its examination, that operators are safe and competent. Collins, ff. Tr. 25,109 at 6. He said that "as soon as the Staff realized that the procedures did not provide as much assurance as deemed appropriate, they were changed." *Id.* Mr. Collins was asked specifically what steps his office had taken to overcome the weaknesses pointed out by the Kemeny Commission. He responded that his office had made an effort to vary the content of the examinations (Tr. 25,155 (Collins)), that the passing grade had been increased, that new categories of subject matter had been added to the examination, and that new candidates for licensing must now be examined on a simulator. *Id.*

283. Mr. Collins was also asked a series of specific questions about the April NRC examination. With respect to proctoring, he testified that "we thought at the time that we . . . [had] the proper balance between the number of people you send on an exam assignment with the various things that they have to accomplish in addition to proctoring" Tr. 25,132 (Collins). He admitted that since the examination the Staff had "revised our thinking, and we have come up with a fairly simple solution to assuring 100 percent proctoring at a minimal cost to our operations." *Id.* He said that he recalled his statement that anyone seeing the "A" examination in April would have had an unfair advantage on the "B", and he admitted that it would be appropriate to ask the examinees not to disclose questions to one another, but he said that the Staff was still considering whether a policy on this subject should be adopted. *Id.* at Tr. 25,147. He was also asked about the fact that Mr. Wilson was absent from the examination room for almost the entire period on the last two days of the examination. Mr. Collins said that he believed that other personnel from NRC were providing proctoring during this time. *Id.* at Tr. 25,148. With respect to the Category T make-ups administered by the Licensee, Mr. Collins appeared to have little knowledge of them. *Id.* at Tr. 25,153.

284. It is difficult to regard Mr. Collins' testimony as adequate. The Staff's administration of the April examination was clearly lax. See ¶¶ 260-265, above. It is disturbing to find that it could be so lax after the concerns expressed by the Kemeny Commission. As Mr. Collins pointed out himself, it would have been possible to provide 100% proctoring at minimal cost. It would also have been simple to instruct the examinees not to disclose the questions to one another and for the proctor to have excluded briefcases. In light of the controversy about the Staff's competence at TMI, it is astonishing that Mr. Collins still did not know, at the time of the hearing, whether anyone was proctoring Mr. Wilson's room on

the April 23 and 24. It is also very surprising, in light of the controversy surrounding the Category T make-ups, that Mr. Collins appeared not to know much about them.

Conclusions about the NRC examination

285. The evidence produces the following conclusions about the NRC examination: First, the administration of the examination was inadequate. The close seating, inattentive proctoring, absence of proctoring, access to briefcases, and access to other examinees in the hall have already been described. See ¶¶ 260-265, above. Second, the grading was also inadequate, in the sense that it did not detect the obvious copying. See ¶267, above. Third, the content of the examination caused the examiner to rely heavily upon the Licensee for answers (¶¶ 276-277, above); it encouraged memorization as a method of preparing for the examination (¶278, above); and it undermined the examination's credibility in the eyes of the candidates who took it (¶¶ 278-279, above). The degree of reliance was, in my opinion, unacceptable, so I find that the content of the examination was inadequate.

286. This last conclusion about the examination's content requires further comment. The heavy reliance upon the Licensee for answers is produced by the type of question asked. The questions elicit specific details of plant design. These details vary from plant to plant, and vary from time to time within the same plant. By deciding to test on this type of information the NRC inevitably must rely upon the licensee to supply it, and to supply some of it at the last minute. The amount of detail is such that the NRC examiners, even with an adequate level of staffing, could not independently master it for all the examinations they must give. Staffing levels at NRC are far from adequate, however, as the NRC Staff admits. Tr. 25,577 (B. Wilson); Tr. 25,637 (Boger). The result is a system of heavy reliance upon the licensee, with the opportunity for abuse described above in the discussion on broadening the answer key (see ¶¶ 153-178).

287. These problems of reliance upon the licensee for answers, and of the examination's credibility, are quite important. However, they are less important than the final problem presented by this evidence. The final problem is this: the operators' opinion of the examination may be right. The examination may not in fact measure their ability to operate the reactor safely. The quantity of evidence on this point was insufficient for a solid conclusion, because this point was not expressly made an issue in the proceeding. However, the evidence does raise a question in one's mind. Of the twelve examination questions which were selected as examples, *all* of

them tested the same form of knowledge. The knowledge consisted of being able to describe the details of design. The questions did not ask the operator to solve a structured problem — which is a higher form of knowledge than the knowledge of the “design facts” which go into such a problem — or to react to a new situation — which is a still higher form of knowledge and which requires knowledge of the technical facts of reactor design, knowledge of how to solve a structured problem, and the ability to use these two forms of knowledge to solve an unstructured problem. Although the operators’ opinion of the NRC examination cannot be taken at face value, their opinion is entitled to weight when it is reinforced by the nature of the twelve questions selected as examples.

G. THE NRC STAFF’S RESPONSE TO THE CHEATING

288. The NRC Staff responded in several ways to the cheating. The Staff made four investigations and filed four separate reports of those investigations. The Staff also voided the April NRC examination, administered new examinations in October, and revised its procedures for proctoring and grading. See ¶268, above.

289. The Staff’s investigation was begun by the Staff’s Office of Auditor and Inspector; however, Chairman Palladino soon directed that the investigation be transferred to the Staff’s Office of Inspection and Enforcement (OIE). Tr. 25,279-281 (Baci). The Office of Auditor and Inspector then wrote a final report (Staff Ex. 24) and turned over the information it had gathered to OIE (Resner, ff. Tr. 25,035 at 3). OIE conducted three subsequent investigations. The first was of the cheating by O and W. The Staff investigators interviewed O and W three separate times; during the third interview, O and W confessed. Staff Ex. 26 at 1-2. The Staff then obtained sworn statements from both O and W (*id.* at Encl. 4, 5) and took steps to insure that neither would continue in licensed duties at TMI (*id.* at 50). The Staff did a thorough and effective job of investigating O and W.

290. The second goal of the first investigation was to determine whether the cheating was limited to O and W. The Staff inspected the ATTS, RO and SRO examinations turned in by candidates other than O and W. The Staff found no improprieties. *Id.* at 1. The Staff also interviewed persons who sat close to O and W, and persons who had failed the NRC examination. Ward, ff. Tr. 25,274 at 7. The Staff did not, however, interview either C or Mr. I. Tr. 25,292, 296 (Baci). C sat directly behind O and W during the RO examination and was in a position to observe the cheating. Lic. Ex. 83. Mr. I sat directly behind O and W on both the RO and SRO examinations and was equally well positioned to observe the cheating. *Id.* Mr. Ward testified that at the time of the first

investigation the investigators did not have a seating chart available and hence did not know who sat behind O and W. Tr. 25,290-291 (Ward). However, W told the investigators during the first investigation that Mr. I had sat directly behind him (TMIA Ex. 55 at 2), and A told the investigators during the first investigation that he (A) had sat next to C, which placed C behind O and W (Tr. 25,292 (Baci)). Also, the investigators did not ask the persons who were interviewed, and who sat next to O and W, specifically whether these persons saw O and W pass papers, whisper, or otherwise cooperate; they asked them only whether, in general, they had seen any cheating during the examination. Tr. 25,293-294 (Baci).

291. During the first investigation, a management representative was present at the interviews. See ¶¶ 186-187, above. This presence "inhibit[ed] the free flow of information." *Id.* It also prevented the investigators from receiving evidence of management involvement on a confidential basis. *Id.* The effect of management's presence at the first investigation was probably not cured by excluding management from the subsequent investigations; a person who had withheld or falsified information at the first investigation would have been unlikely to admit later that he had done so.

292. The Staff's second investigation was launched as a result of YY's allegations concerning Mr. Ross. See ¶142, above. The Staff interviewed YY, Mr. Ross, and other operators who could have been expected to have knowledge relevant to the allegations. Staff Ex. 27 at 1-2. The Staff investigators concluded that they could not corroborate YY's allegations. *Id.* at 46. The Staff did not examine the answer key in arriving at this conclusion, or attempt to assess the credibility of the persons involved. *Id.* During the second investigation, KK revealed that he had received a telephone call during the April NRC examination from a person identifying himself as U. *Id.* at 2; ¶¶ 123-129, above. The Staff compared the question KK said he had been asked with those on the NRC examination (Staff Ex. 27 at 31); the Staff interviewed Mr. Toole (*id.* at 32-33); Mr. Ross (*id.* at 34); U (twice; *id.* at 36-38, 44); QQ (*id.* at 39); P (*id.* at 40-41); T (*id.* at 42); and O (*id.* at 43). Although the telephone call to KK remains a mystery, the Staff's investigation of it was thorough.

293. The second investigation also included the rumor about U being stationed in the vicinity of the examination room to aid examinees, and the rumor that he was stationed there with the approval of management. *Id.* at 3. The Staff concluded that there was no information to substantiate either of these rumors. *Id.* The record is insufficient to show what steps the Staff took to investigate them. The Staff does not appear to have asked U specifically whether he "unknowingly" offered help to anyone in the hall. *Id.* at Encl. 12; ¶117, above. Nor was Mr. Husted asked why he decided to furnish his office to U (Staff Ex. 27 at 16). Nor were the TMI reviewers asked whether they observed U's activities in the office area. See ¶198,

above. The final item considered in the second investigation was the comment by Mr. I. He had said, apparently, that although O and W had been fired, "the people responsible for their cheating were still around." Staff Ex. 27 at 3. When the Staff interviewed Mr. I, he said that his remark had meant only that O and W should have been better prepared by the Licensee for the NRC examination, not that he "knew of other people who cheated." *Id.* at Encl. 9. The Staff accepted his explanation and apparently did not pursue this item further. *Id.* at 3. It is unclear to what extent the Staff investigated the rumors about U writing on his hand or taking crib sheets into the examination. The Licensee's investigation of these rumors is described above in ¶130.

294. The second investigation also produced the statement by P about Mr. Husted's solicitation of an answer in the unproctored room. See ¶102, above. P's statement was not included anywhere in the Staff's reports because the Staff did not consider the incident an act of cheating; the Staff said it was only "attempted" cheating because P did not supply the answer. Tr. 25,320 (Ward). The Staff did not tell the Licensee of P's statement (Tr. 25,418-419 (Ward)) and did not confront Mr. Husted with it. Tr. 25,317 (Ward). Mr. Ward, when asked to explain his position on this point, said that he did not report Mr. Husted's solicitation because it "was not directly relevant to the main thrust of this . . . second investigation, which was management involvement . . ." Tr. 25,417 (Ward).

295. The Staff's third investigation was devoted to the telephone call to WW during the Kelly examination, and to Mr. Shipman's admission that he had supplied an answer to another operator at the coffee stand. Staff Ex. 28 at 1. Both of these events were discovered by the Licensee, which had begun its own investigation after the first and second NRC investigations had been completed. *Id.* The NRC investigators had interviewed WW in the second investigation, but the NRC investigators had not asked him about any examination other than the NRC examination. *Id.* at Encl. 1. WW said that if the investigators had asked him about the Kelly examination, he would have told them about the telephone call. *Id.* During the third investigation, the NRC investigators interviewed WW specifically about the telephone call. *Id.* WW said he did not know the identity of the caller, and did not realize at the time of the call that the question asked was on the Kelly examination. *Id.* Lacking further leads, the investigators did not pursue the matter further. Tr. 25,333 (Ward).

296. The other portion of the third investigation concerned Mr. Shipman at the coffee machine. This incident is described in ¶¶ 94-99, above, and the Licensee's response to it is described in ¶¶ 192-194, above. Mr. Shipman told the NRC investigators the same thing he told Mr. Hukill: that he (Mr. Shipman) could not remember the question, the questioner, or the specific day on which the question was asked. Staff Ex. 28 at 5-7.

As a result of this interview, and of Mr. Shipman's inability to remember the questioner when shown a list of the persons in the smokers' room (Tr. 25,363 (Baci)), the Staff decided to take no further action. The investigators concluded: "Lacking any logical leads, the NRC plans no further investigative action in this matter." *Id.* at 8. Of course, there were logical leads. There were only eight persons in the other examination room, from which Mr. Shipman's questioner apparently came. Lic. Ex. 83. It would have been a simple matter to interview them. When the Staff was asked why the eight were not interviewed, Mr. Ward said that five of the eight already had been asked in earlier investigations whether they were aware of any cheating. Tr. 25,364 (Ward). The questions posed to these five, however, had been general. The questions had not asked specifically about Mr. Shipman. Tr. 25,366-367 (Baci). Therefore, the questions were susceptible to the misinterpretation and vagueness described above in ¶192. The other three persons in the other room were not interviewed at all. The Staff said that five of eight was a "representative number," and that cost-benefit constraints limited further effort. Tr. 25,371 (Ward).

297. The OIE is also responsible for monitoring the Licensee's annual requalification program. Tr. 25,633-634 (B. Wilson). This includes the administration of that program. *Id.* After Mr. Trunk had completed his study of cheating on the weekly quizzes (see ¶¶ 26-27, 200, above) Mr. Trunk's conclusions were available to the Staff. Mr. Trunk concluded that cooperation appeared to have occurred. See ¶26, above. The NRC Staff did not, however, pursue this information. Mr. Ward explained the Staff's reason in his direct testimony. He made the following points: First, that Mr. Trunk had found three instances in which there might have been cheating; second, that "in response to questions posed by the Staff, Licensee's counsel indicated that two of the answers which appeared to indicate cheating were suspicious, but not conclusive"; third, that the third instance could not be explained; fourth, that "based on OIE's review of Professor Trunk's report, we find his methodology and analysis adequate." Ward, ff. Tr. 25,274 at 3-4. Mr. Ward was asked about these points on cross examination. First, Mr. Ward was shown the report from Mr. Trunk dated October 14, 1981. Lic. Ex. 70E. This was the report which discussed G's and H's similar definitions of Bernoulli's equation, and which concluded that "some cooperative effort did take place." *Id.* Mr. Ward testified that he had not seen that report before it was shown to him on the witness stand. tr. 25,336 (Ward). He said that the statement in his direct testimony about instances which were suspicious but not conclusive referred to Mr. Trunk's earlier report dated October 1, 1981. Tr. 25,337 (Ward). Mr. Ward was also asked about the NRC Staff's review of the investigation which Mr. John Wilson had done to follow up on Mr. Trunk's reports. Mr. Baci responded, and said that the review was limited

to looking at copies of some of Mr. Wilson's interview reports while Mr. Baci was in Mr. Wilson's office. Tr. 25,399-400 (Baci). Mr. Baci said that he looked at the reports because Mr. Wilson asked him to do so. *Id.* In response to a direct question by me, Mr. Ward admitted that no one in his office had made an independent comparison of the parallel answers given by G and H. Tr. 25,443-444 (Ward). Mr. Ward explained why the Staff did not devote more effort to these matters. He said:

We decided, based on the resources available to us, the lack of immediacy to the examination in which we had the greatest interest — that is, the April examinations — that it was more remote. Based on that, we elected to take no further action.”

Tr. 25,338 (Ward). Mr. Ward added:

“As we go backwards in time [from the NRC examination] it becomes more and more remote to us . . . and it becomes less useful for us on a cost-benefit basis to commit resources to it.”

Id. at Tr. 25,343.

298. My conclusions on the Staff's investigations are as follows. First, the Staff did a thorough job of investigating the cheating by O and W. Beyond these two matters, however, the Staff's performance was uneven. The Staff's first investigation was not sufficiently thorough to determine whether other operators saw O and W cheat. Also, that investigation was conducted with management present at the interviews. Management's presence was unwarranted, it burdened the flow of information, and it prevented the Staff from receiving information in confidence. These disadvantages should have been enough to convince the Staff to exclude management.

299. In the second investigation, the Staff interviewed the individuals who had information about YY's allegations, but the Staff did not analyze the changes to the answer key. Those changes had been the basis for one of YY's allegations. Nor did the investigators follow up in very much detail the rumor about U being stationed in the hall, or follow up the rumors about U writing on his hand or using crib sheets. Given the limits on the Staff's resources, these steps may not have seemed worthwhile at the time of the Staff's investigation.

300. A lack of resources cannot explain the Staff's attitude about Mr. Husted, however. It is simply not acceptable to consider Mr. Husted's solicitation of P — which the Staff said Mr. Husted made — as other than cheating. P's failure to provide Mr. Husted an answer does not change what Mr. Husted did. There is no ethical or moral difference between an attempted solicitation and a successful one. Mr. Ward's statement that the second investigation's “main thrust” was management involvement, and therefore that the solicitation was “not directly relevant,” cannot be taken seriously. An instance of cheating which would have been

relevant to the first investigation, and to the third investigation, does not become irrelevant because it came up during the second investigation. The Staff should have reported this incident, and the Staff should have followed up on it by confronting Mr. Husted with P's statement.

301. The Staff also cited its lack of resources as a reason for not following up on the Shipman incident. As stated above, it would have been a simple matter to have asked the eight persons in the other examination room whether they had received an answer from Mr. Shipman. In view of the strong likelihood that one of the eight persons cheated, the cost-benefit argument fails. There was a strong lead and a narrow field of suspects. The Staff's decision not to pursue this lead was clearly wrong.

302. The last conclusion concerns the Trunk reports. The Staff's response to those reports was to not read them. The Staff never made an independent comparison of the answers of G and H, nor, apparently, of W and GG. Mr. Ward had never seen the fourth report, which contained the parallel definitions of Bernoulli's equation, before he testified at the hearing. The Staff seems simply to have taken Mr. John Wilson's word for the fact that the parallels were "suspicious, but not conclusive." The lack of basis for Mr. Wilson's views is revealed above in ¶¶ 202-219. Mr. Ward's statement that "as we go backwards in time" the incidents in the Trunk reports became "more remote" was not based upon any knowledge of the reports. The second round make-up for Category T, upon which there were numerous similar answers, was given on March 27, 1981 (see ¶246, above); the NRC examination was given less than one month later (see ¶139, above). The third round make-up for Category T, upon which there were also similar answers, was given on June 25, 1981 (see ¶67, above), which was two months *after* the NRC examination was given. In fact, the cheating on the make-ups was very close in time to the cheating on the NRC examination. The similarities between the answers of G and H, and of W and GG, were obvious from the Trunk reports and Mr. Trunk's conclusions were also obvious. The Staff's decision not to pursue this evidence was explained only by citing costs and benefits. In the face of evidence as clear as that in the Trunk reports, costs and benefits cannot justify inaction. The Staff should have pursued this evidence.

III. CONCLUSIONS AND RECOMMENDATIONS

303. The conclusions and recommendations presented below concern three different kinds of interests: those of individuals; those of the Licensee; and those of the NRC Staff. Because these interests are different — particularly the interests of the individuals — different considerations

are appropriate in deciding what conclusions and recommendations to make respecting them. For example, an individual has an interest in maintaining his employment, and can expect not to lose his employment absent a showing of serious misconduct. The Licensee's interest is a corporate interest. In this case that interest is in being authorized to restart TMI-1. In pursuit of that interest the Licensee has the general burden of proving to the Licensing Board and the Commission that the authorization should be granted. The NRC Staff has a governmental interest in its own procedures, action, and decisions in the matters over which it exercises regulatory control. It has the general burden of proving that these procedures, actions and decisions were adequate at TMI-1.

A. CONCLUSIONS AND RECOMMENDATIONS: INDIVIDUALS

304. The individuals who have been implicated in cheating or other misconduct are O, W, G, H, GG, MM, U, VV, Mr. Shipman, and Mr. Ross. Their actions differed widely. The actions occurred on different examinations, under different circumstances, and were different in character. Separate conclusions and recommendations are made for each individual.

O and W

305. O and W both engaged in a pattern of cheating over a period of time. They also conspired to cheat, by agreeing to do so before examinations were given. They both lied to NRC investigators during their first two interviews. When they testified in this proceeding neither was forthright under oath. O, in particular, still fails to recognize the character of his acts.

306. O and W were both fired when their guilt was established. Both have found other employment. In the case of O, something stronger than dismissal will be required to convince him that the NRC licensing process is important. O's attitude was not unique to himself, although he seemed to express it more clearly than others.

307. O and W appear to have violated two sections of the United States Criminal Code. The first, 18 U.S.C. §1001, makes it unlawful to knowingly falsify or conceal a material fact, or make false statements or representations of a material fact in any matter within the jurisdiction of a department or agency of the United States. The elements of this offense are (1) a statement, (2) falsity (materiality), (3) specific intent, and (4) agency jurisdiction. The second is 18 U.S.C. §371, the conspiracy statute.

Persons indicted under this statute can be charged with conspiracy to defraud the United States, with conspiracy to commit an offense against the United States, or with both. The elements of this offense are (1) an agreement between two or more persons, (2) an unlawful purpose, and (3) an act by one or more of the conspirators to further this purpose. The unlawful purpose can be to defraud the United States or to commit an offense against the United States.

308. Examples of false statements prohibited by §1001 are the following: concealing material facts relating to a patent application, *United States v. Markham*, 537 F.2d. 187 (5th Cir. 1976); submitting false statements in response to inquiries from the Securities and Exchange Commission, *United States v. DiFonzo*, 603 F.2d. 1260 (7th Cir. 1979); filing a false complaint with the Federal Bureau of Investigation, *United States v. Lambert*, 501 F.2d. 943 (5th Cir. 1974); signing false names to civil service examinations, *United States v. Salazar*, 293 F.2d. 442 (2d Cir. 1961); stating falsely to the Nuclear Regulatory Commission that security guards had been properly requalified on firearms, *United States v. Barry*, Case No. 78 CR 28 (W.D. Wis. 1978).

309. The facts in the *Salazar* case are closest to the conduct by O and W. In *Salazar*, the defendant was charged with conspiracy to violate 18 U.S.C. §1001 by taking civil service examinations for ten of his fellow post office employees and signing identification cards and declarations of honesty in their names. Although the court remanded the case because of prejudicial statements by the trial judge, the court found that the materiality and jurisdiction elements of the offense had been clearly established. 293 F.2d. at 445. In general, the test for the materiality of a false statement is "whether the statement has a natural tendency to influence or was capable of influencing the decision of a tribunal in making the determination required to be made." *United States v. DiFonzo*, 603 F.2d. at 1266. A materially false statement is one "calculated to induce action or reliance by an agency of the United States." *United States v. East*, 416 F.2d. 351, 353 (9th Cir. 1969). The copied answers on the NRC examination were materially false in the sense that the Commission would have relied upon them to evaluate the operators' abilities. While the copied answers are not false in the sense of "incorrect," they are false under this statute because they misrepresent the knowledge of the examinees. Such a misrepresentation impairs one of the Commission's functions, which is to evaluate the operators. As the court in *Lambert* noted, "perversion of a governmental body's function is the hallmark of a §1001 offense." 501 F.2d. at 946.

310. Because of the generally disrespectful attitude at TMI-1 toward the NRC examination, the other acts of cheating or attempted cheating which occurred during the examination, the unrepentant posture of O, W,

and some of the other operators, and the threat to the public health and safety posed by unqualified operators and supervisors, I believe the Commission should recommend criminal prosecution of O and W.

G and H

311. G and H also engaged in systematic, extensive cooperation over a period of time. The evidence of their cooperation was clear, both from the number, and the nature, of their similar written answers. Despite this clear evidence they denied to Mr. Wilson that they had cooperated and they also denied it on the witness stand. Their denials were wholly implausible. The only mitigating factor concerning G and H is the possibility that they may have thought, because of the loose administration of the weekly quizzes, that cooperation was acceptable. The stance they took at the hearing, however, and the stance which the Licensee took, was to deny that they were, or could have been motivated by such a thought. The Licensee and these individuals took the position that cooperation on the quizzes was cheating, and then contended, in the face of overwhelming evidence to the contrary, that no cheating occurred. The fact is that G and H are guilty of cheating as they and the Licensee have defined cheating. I see no alternative to concluding, and recommending, that the Licensee be prohibited from using G and H to operate TMI-1.

GG, W, and MM

312. On one weekly quiz, GG, W, and MM gave stilted, unnatural, virtually identical answers with the same misspelling. The correct answers of the two other operators who took this same quiz at the same time were expressed in natural language wholly different from that used by GG, W, and MM. The evidence of cooperation is therefore very strong. MM's participation, however, is limited to a brief answer to one question. MM could have copied lesson materials, although the possibility that he did so independently of GG and W is slight because of the wholly different answers given by S and Y, who presumably would have had access to the same materials. With respect to MM, I believe the brevity of his involvement argues against any strong sanction. He was never called to testify, and so had no opportunity to respond to questions from the parties. I recommend that no action be taken against MM.

313. With respect to GG the issue is more difficult. The similarities between GG and W were more extensive than the similarity involving MM, were not explained despite testimony on the witness stand, and apparently cannot be explained. In GG's favor is the fact that he was comparatively forthright in his testimony. He stated that the quizzes were not taken seriously by the instructor or the candidates, that talking occurred, and that instructional materials were present. He gave me the impression that he did not believe, at the time of the quizzes, that cooperation in such an atmosphere was a serious matter. Also in GG's favor, in comparison to G and H, is that GG's cooperation was limited to a single quiz. There is no evidence that GG systematically cooperated over a period of time. I do not believe that GG's conduct was so serious that he should be prevented from performing licensed duties at TMI-1. Some lesser sanction might be appropriate, but the amount of discretion in formulating it is very great. I do not have the information necessary for exercising that discretion. Therefore, I make no recommendation regarding a lesser sanction.

Mr. Shipman

314. Mr. Shipman gave a single, spontaneous answer at the coffee machine to a person who Mr. Shipman believed was taking the NRC examination. The discipline imposed by the Licensee was to place a letter of reprimand in Mr. Shipman's file. In view of Mr. Shipman's position and responsibility, this discipline may seem mild. However, discipline is inherently discretionary. One must consider, as the Licensee did, Mr. Shipman's employment record and other facts. I cannot say that this discipline fell wholly outside the range of what is appropriate to Mr. Shipman's conduct at the coffee machine.

315. The more serious problem with Mr. Shipman is that he does not appear to be telling the truth about what he remembers. Mr. Shipman's statement that he cannot remember his questioner proved to be inconsistent with the circumstances under which the question was asked, with Mr. Shipman's responsibility and background, and with Mr. Shipman's own testimony. The evidence shows, in my view, that Mr. Shipman is protecting someone. This presents the following situation: Mr. Shipman cheated; another person, not named, also cheated; Mr. Shipman has failed to give a credible reason for not naming that person. On the record as it now stands, Mr. Shipman's responsibility to name his questioner, or give a credible reason why he cannot name him, has not been met. It is unacceptable for

such a responsibility not to be met. I conclude, and recommend, that the Licensee be prohibited from using Mr. Shipman to operate TMI-1 until the Licensee can show that this responsibility has been met.

Mr. Husted

316. The preponderance of the evidence showed that Mr. Husted solicited an answer from P in the unproctored room. The evidence is fully described above. However, the evidence amounted to Mr. Ward saying that P said that Mr. Husted made the solicitation. Because of Mr. Ward's credibility, and because Mr. Ward's description of P's statement was corroborated by P's deposition, and by P's statements to the NRC investigators, I found that P said what Mr. Ward said that P said, and I found that what P said was true. Thus, I found that Mr. Husted made the solicitation. Mr. Husted denied making the solicitation, but his flippant demeanor and general lack of credibility deprived his denial of any weight.

317. The evidence of Mr. Husted's solicitation establishes only a single act. That act is not more culpable than Mr. Shipman's act of giving a single answer at the coffee machine. With respect to Mr. Shipman, I have already said that a letter of reprimand seemed within the acceptable range of discipline for a single act of cheating. Mr. Husted, however, refused to cooperate with the NRC investigation. He appears to have deliberately withheld information from the NRC investigators because the investigation annoyed him. He "did not like the way the investigation was conducted." I cannot see how Mr. Husted's attitude can be acceptable, particularly on the part of a training instructor. In sum, Mr. Husted solicited an answer from P; he appears to have withheld information from the NRC investigators; and he displayed an attitude toward the hearing and the investigators which was unacceptable. Is this enough to exclude Mr. Husted from licensed duties? Or from the Licensee's training program? The only way to answer that question is to have some standard against which to measure the seriousness of these deficiencies. The Licensee's employees do have an obligation to cooperate forthrightly with public regulation, and Mr. Husted did not meet that obligation. Once that is said, however, there remains the problem of deciding what to do about Mr. Husted's failure to meet it. Once again, I find myself without sufficient guides — this time in the form of standards — for arriving at a solid conclusion. Because the evidence that Mr. Husted made the solicitation is subject to at least a small doubt, and because I can find no reliable standard for judging the seriousness of his poor attitude and lack of cooperation with public regulation, I cannot conclude or recommend that he should be removed from

licensed duties. A lesser sanction is no doubt appropriate. However, as in the case of GG above, the lesser sanction requires discretion, and I do not possess the information necessary to exercise such discretion. Therefore I make no recommendation regarding a lesser sanction.

U

318. U spent the two days following his NRC examination in Mr. Husted's office, where U said he was studying for an oral examination scheduled to be given four to six months later. There was a widespread rumor that U was available in the hall to look up answers for examinees. U approached OO in the hall and made an offer of assistance. On one of these same two days, KK received a telephone call from a person identifying himself as U. The caller said he (the caller) was helping O on the NRC examination. The preponderance of the evidence showed that U made the telephone call. U testified that he would not have considered it cheating to give someone a brief answer on the NRC examination, and that he might have done so — without remembering it — when he was in the hall. There were also rumors that U wrote on his hand and took crib sheets into the examination. The evidence was insufficient to establish that U was stationed in the hall by the order of, or with the knowledge of, management.

319. U's conduct and attitude are clearly not acceptable. His conduct consisted of offering assistance to OO in the hall and, apparently, of making the telephone call to KK. The telephone call to KK was not an act of cheating because of the question asked, although the caller's stated intent was to cheat by helping O on the NRC examination. The rumors that U wrote on his hand and used crib sheets were not substantiated. So the evidence on U boils down to this: he offered assistance to OO; he appears to have made the telephone call to KK; he may have "unknowingly" supplied a brief answer to someone in the hall (which he would not have considered cheating); and all of this is consistent with the rumor that he was available to assist examinees. When these items are taken together they are very disturbing. When they are taken one by one, however, they appear less serious. The offer of assistance to OO was the only such offer established by the evidence; the evidence that U telephoned KK was not without doubt; and U never admitted that he actually helped anyone "unknowingly." In order for me to conclude and recommend that U be removed from licensed duties, I believe the evidence of his misconduct should be clearer in the individual instances. The offer of help to OO is the only act of misconduct supported by strong evidence. The

telephone call is not supported by strong evidence. It might be possible to conclude that the offer, plus whatever chance there is that U made the call, plus the rumors, and plus U's attitude, are sufficient in combination for removal from licensed duties. It would seem to be a matter of judgment whether one should insist upon strong proof of each item in a series, or whether one can accept an inference from the cumulative effect of the items taken together. I prefer to give U the benefit of the doubt, so I do not conclude or recommend that he be removed from licensed duties. I make no conclusion or recommendation regarding a lesser sanction for the same reasons as given above for GG and Mr. Husted.

VV and Mr. Ross

320. Mr. Ross and VV are members of the Licensee's management. As such, their acts are the Licensee's acts. Their conduct will be considered below in the discussion pertaining to the Licensee.

B. CONCLUSIONS AND RECOMMENDATIONS: THE LICENSEE

321. The conclusions and recommendations concerning the Licensee are presented in the following order: first, management's involvement in cheating; second, management's responsibility for the cheating; third, the Licensee's response to the cheating; fourth, the Licensee's training and testing program; and fifth, the Licensee's system for certifying candidates.

Management's involvement in cheating

322. There was no evidence that the Licensee's management encouraged, condoned, participated in, or knew of the cheating by O and W when it occurred. Nor is there any such evidence respecting any of the other individuals mentioned above. There is, however, the question whether the Licensee is responsible for the attitude which produced the cheating. That point is discussed below.

323. The evidence showed that Mr. Ross acted improperly in his review of the answer key to the NRC examination. Twelve changes to the key were examined at the hearing; in two of them there was no rational ground for the changes, there was an advantage to the reviewers' grades from the

changes, and the reasons which the reviewers gave for the changes were not credible. Remarks which Mr. Ross made at the time of the review revealed that Mr. Ross did not act in good faith when he advocated the changes, and Mr. Ross' testimony about the circumstances of the review was not credible. The review of the answer key also had the effect of keeping the proctor away from the examination room for a long time. The evidence of Mr. Ross' motive in keeping the proctor away was not as strong as the evidence concerning the changes to the answer key. However, as I indicated above, I found that the preponderance of the evidence on this point was that Mr. Ross intended to keep the proctor away in order to aid the examinees.

324. The NRC examination relies heavily upon the licensee's reviewers for answers to detailed questions. For the examination to achieve its purpose, the reviewers must act in good faith. If the reviewers use their greater knowledge to mislead the NRC examiner, then the examination can only measure the examinees' answers against the reviewers' suggestions. There is no longer a measure of whether the answers correspond to the facility or to its operation. For this reason, the obligation of good faith in the review of the examination is quite important. I conclude that the Licensee failed to meet that obligation in this case. I also conclude that the failure of the Licensee's management to meet this obligation of good faith shows an attitude toward the NRC examination which is not acceptable.

325. The question of management's involvement in cheating also poses the question of who should be considered "management." As stated above, the cheating on the NRC examination did not occur in the lower ranks of the operations staff. It occurred in the middle and upper ranks. The senior operations engineer, the two shift supervisors, and the shift foreman came from those ranks. Shift supervisors and shift foremen have important responsibilities for safety and for supervision. They function as managers while on duty, and their authority is important. With respect to the operations staff, the cheating involved the "management" of that staff. Adding G, H, and GG to the list of those who cheated shows that the operations staff was deeply compromised by the evidence in this case. Mr. Ross and VV, who functioned as the link between upper management and the operations staff, were also compromised. In light of the number of persons who were compromised, and their positions on the operations staff, I conclude that the overall level of integrity of the operations staff has been shown to be inadequate.

Management's responsibility for the cheating

326. To what extent was management responsible for the cheating? This was one of the most elusive, yet important issues at the hearing. The Licensee recognized that it is

difficult to assess . . . whether management has a properly serious attitude about the subject [of cheating], has inculcated its staff with a fundamental understanding of its responsibilities in this regard, and has established adequate lines of communication with its staff members to "reach" them on this subject.

Lic. Proposed Findings ¶ 231.

327. The issue with respect to O, W, U, Mr. Husted and Mr. Shipman is whether the Licensee fostered an attitude which caused these persons to cheat. There was substantial testimony about this attitude, and the Licensee's responsibility for it. W testified that the NRC examination was "one we did not want to participate in . . .;" O said "I did not cheat because I did not copy any answers;" Mr. Shipman said that he regarded supplying an answer at the coffee machine as "insignificant;" and U said he did not consider it cheating to supply someone a brief answer "unknowingly" in the hall. The Licensee admitted that the "operators were quite bitter about the reexamination requirement" *Lic. Proposed Findings* at 129. Several of them expressed this sentiment at the hearing. Tr. 25,686-87 (GG); Tr. 25,843 (HH); Tr. 26,308 (V); Tr. 26,559, 26,588-89 (I). See also ¶278, above. Mr. Hukill testified that he was "concerned with the . . . problem of the degree to which O and W felt 'driven' to cheat . . .," and he described his discovery of the "degree of the morale problem with the operators, and of a need to change their attitude with respect to the importance of the examination process." Hukill, ff. Tr. 23,913 at 11. Mr. Hukill said that he did

not know how much they were driven to cheat There is obviously a very strong feeling from the top to the bottom up there to get that plant on the line Did I push this to the point where these people felt they had to cheat to do it? I would like to say to myself that I am totally innocent, that I did not at all contribute to this; but I somehow cannot do that."

Tr. 24,010-011 (Hukill).

328. Management must have known of the widespread, negative attitude toward the NRC examination. The OARP program and the ATTS examination were designed to prepare the operators for the NRC examination. They were management's principal response to the deficiencies in

training which had been revealed by the accident at TMI-2. It was management's responsibility to insure that the training program succeeded, and to insure that the operations staff realized the importance of the reexamination requirement. I conclude that management failed in its responsibility to instill in the operations staff a proper attitude toward the NRC examination and that after an improper attitude had developed, management did not act to change that attitude. Although management did not encourage or condone the cheating, it permitted an attitude to develop which caused the cheating to occur.

329. Management's responsibility for the acts of G, H, GG, and MM depends upon the conditions under which the weekly quizzes were given. There was inadequate or non-existent proctoring, examinees cooperated, and the operators were uncertain whether they were expected to do their own work. The Licensee must have known that these conditions existed. If it did not, then its management was out of touch with the training program. Since the Licensee was relying upon the training program to overcome the deficiencies revealed by the accident at TMI-2, it is fair to suppose either that the Licensee was not out of touch with the training program, or should not have been out of touch with it. At the very least, the Licensee should have learned of the poor testing conditions on the weekly quizzes when the Licensee prepared for this hearing. Yet, the Licensee did not admit at the hearing that the poor testing conditions, and the operators' uncertainty whether they were expected to do their own work, might explain the similar answers on the weekly quizzes. The Licensee took the position that cooperation on the weekly quizzes was "cheating," and then denied that cheating had occurred. This made it necessary to pull the evidence of cooperation out of the operators on the witness stand. I concluded above, in the case of G and H, that the Licensee should be made to live with its characterization of G's and H's conduct. However, that does not mean that the Licensee is not responsible for it. In effect, the Licensee's litigation strategy was to maintain the credibility of its training program by characterizing the cooperation on the weekly quizzes as "cheating" when the operators did not regard it as such at the time it happened. The heavy reliance upon memorization in the training program, and the poor quality of many of the questions to which similar answers were given, encouraged cooperation. I conclude that the cooperation on the weekly quizzes was caused directly by the conditions under which the quizzes were given, and that the Licensee was responsible for those conditions and whatever "cheating" occurred.

330. There remains the question of management's responsibility for the acts of VV and O in 1979. When VV submitted as his own work answers written by O, VV was Manager of Operations at TMI-2. He had direct

line authority over O and was responsible for O's involvement. VV's acts, and his disrespect for the training program, were the acts and disrespect of a person in management.

331. There was no evidence that any of VV's superiors authorized VV to act as he did. VV's decision was apparently his own. There was, however, evidence that the training program was not taken seriously at this time. Mr. Arnold testified that a person missing class could make it up through "correspondence-type courses" (Tr. 23,627 (Arnold)), that VV had relied too much upon these courses (*id.* at 23,710), that during the year or two before the accident at TMI-2 training had not been a high priority (*id.*), and that at the time of VV's acts, management's effort to improve the training program "did not include the administration of the examinations in the way in retrospect it clearly would have desired to be the case." *Id.* at 23,890. This evidence shows that the Licensee allowed a poor attitude toward the training program to develop, and did little to change that attitude. The Licensee admitted that it "did not give sufficient attention to preserving the integrity of its training and testing program." *Lic. Proposed Findings* at ¶167. It is difficult to know whether VV's acts were caused by this attitude. Could VV honestly have believed that O's answers would be accepted by the training department? The Licensee's reaction was to grade the answers and credit the scores to VV. I conclude that the Licensee was responsible for VV's acts in only three respects: first, VV was a member of management and acted as such when he obtained O's assistance; second, VV set a poor example for his subordinates (the Licensee so admits; see *Lic. Proposed Findings* at ¶ 147); third, VV's attitude of disrespect for the training program was one which the Licensee allowed to develop and did little to change.

The Licensee's response to the cheating

332. As stated above, the Licensee responded to three different types of cheating. First, the cheating on the NRC examination in April of 1981; second, he cheating on the weekly quizzes; third, the cheating by VV and O in 1979. With respect to the first, the Licensee responded to the cheating by O and W, to Mr. Shipman's remark at the coffee machine, and to the various allegations concerning U. With respect to the second, the Licensee examined the similarities among the answers given to the weekly quizzes by all the operators who took them. With respect to the third, the Licensee's response had already been made in 1979, but the propriety of the response was made an issue at the hearing.

333. My conclusions on management constraint of the NRC investigation, management's dealings with O and W, management's meetings with employees, and management's response to U and Mr. Shipman are set out above in ¶¶ 185-191. I have nothing further to add here on those topics.

334. The Licensee's response to cheating on the weekly quizzes was Mr. John Wilson's investigation. Mr. Wilson testified at the hearing as an impartial investigator, but he presented only evidence which tended to show the absence of cooperation. He could not explain the similar answers of G and H on the question having to do with "two major areas of weakness noted by the Lessons Learned Task Force," but he did not regard the similar answers as evidence of cheating; he accepted an incorrect explanation from G on the question about the Rosemount transmitter (to which G gave a wrong answer similar to H's) without bothering to check G's explanation with the training department; he could not explain the similar wrong answers (which made no functional sense) by G and H on the generation of hydrogen gas, but he did not regard the similar answers as evidence of cheating; with respect to the similar wrong answers of G and H saying that radiation monitors were located in the control room, he refused to admit that the answers were even similar; in order to avoid finding that the uniquely similar definition of Bernoulli's equation by G and H was evidence of cheating, Mr. Wilson gave misleading testimony on how G and H said they learned the definition; to explain the fact that G and H alone showed a consistent pattern of similar answers on several different examinations, Mr. Wilson advanced the theory that copying causes one to pass, that cooperation would have produced more similarities than were found (similar answers were found on 8 points out of the possible 13.5), and that if similar answers were memorized on one quiz they would have been memorized on another. Mr. Wilson also failed to consider the highly relevant fact of how the weekly quizzes were administered in arriving at his conclusion. My conclusion is that Mr. Wilson did not conduct a thorough or impartial investigation of the cheating on the weekly quizzes. Since the Licensee's response to this cheating consisted of Mr. Wilson's investigation, and since Mr. Wilson's testimony was the Licensee's position, I conclude that the Licensee's response to the cheating on the weekly quizzes was inadequate. I also conclude that the Licensee's testimony on this point was very poor.

335. The Licensee's response to the cheating by VV and O has been explained above. Although the Licensee's reluctance to discipline O was understandable — VV was O's supervisor and O could be expected to comply with VV's request — the Licensee's acceptance of O's statement that O did not know the reason for VV's request had very little basis. The Licensee acted properly and in accordance with its procedures when it removed VV from licensed duties. However, the Licensee's contention that

VV was removed permanently from licensed duties because of his training deficiencies was not supported by the evidence. Nor was the Licensee's contention that the removal was a demotion, and known to be such by the operations staff, supported by the evidence. The Licensee should have informed the NRC of VV's cheating, and should not have written a letter to the NRC which stated falsely that VV had achieved a score on an examination which in fact had been achieved by O and VV together. The Licensee's failure to disclose VV's cheating to the NRC was deliberate, improper, and resulted in a false statement upon which NRC relied in reviewing VV's license. This conduct fell considerably short of being acceptable.

The Licensee's training and testing program

336. My conclusions on the Licensee's training and testing program are set forth above in ¶ 251. As that paragraph states, I conclude that the Licensee's training program was not an adequate response to the Commission's Order of August 9, 1979.

The Licensee's system for certifying candidates

337. The evidence on the Licensee's system for certifying candidates is set out in ¶¶ 252-258, above. My conclusions on that system are stated in ¶ 259.

Overall conclusions: the Licensee

338. There was no evidence that the Licensee's upper management encouraged, condoned, participated in, or knew of the cheating by O and W when it occurred. Nor is there any such evidence respecting cheating by any of the other individuals named in this report. However, the Licensee failed to meet its obligation to review the answer key to the NRC examination in good faith, and that failure showed an unacceptable attitude toward the NRC examination. The number, and the responsibility, of the persons on the Licensee's operations staff who were compromised by the evidence in this case was such that the overall integrity of the operations staff was shown to be inadequate. Although the Licensee did not encourage or condone the cheating on the NRC examination, it permitted an attitude to develop which caused the cheating to occur. The

cooperation on the weekly quizzes was caused by the conditions under which the quizzes were given, and the Licensee was responsible for those conditions. The Licensee's response to the cheating on the weekly quizzes was inadequate and its testimony at the hearing on that subject was not credible. The Licensee's response to the incident involving VV in 1979 was unacceptable because of the Licensee's lack of candor with the NRC. The Licensee's training and testing program was poorly administered, weak in content, ineffective in its method of instruction, and not an adequate response to the Commission's Order of August 9, 1979 CLI-79-8, 10 NRC 141.

C. CONCLUSIONS AND RECOMMENDATIONS: THE NRC STAFF

Proctoring and grading

339. My conclusions on the proctoring and grading of the NRC examination are set forth above in ¶¶ 226-227, 285. I concluded that the Staff was lax and that its procedures were inadequate. The Staff's new procedures for proctoring are also described above. They were used successfully during the examination at TMI-1 in October of 1981. They should be effective in preventing cheating on NRC examinations in the future if they are followed carefully.

Content of the examination

340. My conclusions about the content of the NRC examination are set forth in ¶¶ 285-287, above. The content of the examination caused the examiner to rely heavily upon the Licensee for answers; it encouraged memorization as a method of preparing for the examination; and it undermined the examination's credibility in the eyes of the candidates who took it. Also, the twelve questions chosen as examples all tested the same form of knowledge. That knowledge consisted of being able to describe the details of design. The questions did not ask the operator to solve a structured problem — which is a higher form of knowledge — or to react to a new situation, which is a still higher form of knowledge. The operator's criticism of the examination was corroborated by the nature of these twelve questions. Because of the examination's heavy reliance upon the Licensee for answers, its encouragement of memorization, its lack of credibility in the eyes of the examinees, and the comparatively rudimen-

tary form of knowledge which the examination tested, I conclude that the April NRC examination was inadequate in its content. I recommend that the Commission take steps to assure itself that the type of knowledge which the examination tests is the type of knowledge which reactor operators should have. I also recommend that the Commission take steps to reduce the heavy reliance upon licensees for answers to the examination's questions, and to avoid having memorization be the primary means of preparing for the examination.

The NRC Staff's response to the cheating

341. My conclusions on the Staff's response to the cheating are stated above in ¶¶ 298-302. They can be summarized as follows: First, the Staff's investigation of the cheating by O and W, and the investigation of the telephone call to KK, were thorough and entirely adequate. The Staff should not, however, have permitted management to be present at the interviews conducted during its first investigation. Management's presence burdened the flow of information and prevented the Staff from receiving in confidence any evidence of management involvement. The Staff should have reported Mr. Husted's solicitation of Mr. P in the unproctored room; the Staff's stated reasons for not reporting this incident were inadequate. The Staff should have asked the eight persons who took the "A" examination in the smokers' room whether they received assistance from Mr. Shipman at the coffee machine. Finally, the Staff should have followed up on the Trunk reports, which contained clear evidence of cooperation on a series of weekly quizzes. Instead of doing so, the Staff did not read the Trunk reports carefully; the Staff relied instead upon Mr. John Wilson's characterization of this evidence as inconclusive.

Overall conclusions: the NRC Staff

342. My overall conclusions on issues concerning the NRC Staff are as follows: First, with respect to proctoring and grading the NRC examination in April of 1981, the Staff was lax and its procedures were inadequate. Second, the Staff's new proctoring procedures should prevent cheating on NRC examinations in the future if the procedures are carefully followed. Third, the content of the NRC examination in April was inadequate. Fourth, the Commission should take steps to assure itself that the NRC examination in fact tests the type of knowledge which reactor

operators should have. Fifth, the NRC Staff's investigation was adequate with respect to some of the cheating which occurred, but inadequate with respect to other cheating which occurred.

D. OVERALL CONCLUSION OF THE SPECIAL MASTER

343. As stated in ¶ 3, above, the broad issue in this proceeding is the effect of the record made here on the Licensing Board's Partial Initial Decision. It is the Licensing Board's duty, rather than my duty, to determine whether the Licensee's management and operations staff have demonstrated the necessary level of competence and integrity to operate safely Three Mile Island Unit 1. It is also the Licensing Board's duty to determine whether the NRC examination is a reliable measure of that competence. I offer no overall conclusion on these questions, although I recognize that some of the conclusions I have reached above have a great potential for determining the ultimate issues before the Licensing Board. I recommend that the Licensing Board adopt the conclusions I have reached above.

344. I also recommend that the Licensing Board receive, as part of the record in the restart proceeding before it, the record compiled in this proceeding before me. This record includes the transcript of testimony and the exhibits admitted into evidence.

Gary L. Milhollin
ADMINISTRATIVE JUDGE

Rendered:
Bethesda, Maryland
April 28, 1982

APPENDIX A
KEY TO LETTER
DESIGNATIONS OF INDIVIDUALS

Letter	Position	Name
A	Shift Supervisor	
B	Shift Foreman	
C	Control Room Operator	
D	Control Room Operator	
E	Shift Supervisor	
F	Shift Supervisor	
G	Control Room Operator	J. Banks
H	Control Room Operator	D. Mayhue
I	Shift Supervisor	B. Mehler
L	Control Room Operator	
O	Shift Supervisor (terminated)	
P	Shift Supervisor	
Q	Control Room Operator	
R	Control Room Operator	
S	Shift Supervisor	
T	Control Room Operator	R. Heilman
U	Shift Foreman	

V	Control Room Operator	
W	Shift Supervisor (terminated)	
X	Shift Foreman (terminated)	
Y	Control Room Operator	
Z	Shift Foreman	
AA	Control Room Operator	
GG	Shift Foreman	D. A. Smith
HH	Control Room Operator (terminated)	V. Ruppert
JJ	Shift Technical Advisor	
KK	Shift Technical Advisor	R. Lengel
MM	Shift Technical Advisor	
NN	Control Room Operator (terminated)	
OO	Control Room Operator	
PP	Shift Technical Advisor	
QQ	Shift Technical Advisor	
RR	Shift Technical Advisor	
SS	Control Room Operator (terminated)	
UU	Control Room Operator	
VV	Employee at TMI-2	

WW

Shift Technical Advisor

H. Crawford

YY

Employee at TMI-1
TMI Project
(terminated)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Charles Bechhoefer, Chairman
Dr. Frederick P. Cowan
Ralph S. Decker

In the Matter of

Docket Nos. 50-329 OM
50-330 OM
Docket Nos. 50-329 OL
50-330 OL

CONSUMERS POWER COMPANY
(Midland Plant, Units 1 and 2)

April 30, 1982

The Licensing Board imposes, on an interim basis, certain conditions governing soils-related construction activities. The conditions, which are to remain in effect pending issuance by the Board of a Partial Initial Decision, require that Consumers Power Co. obtain NRC Staff approval before commencing certain activities and that, with limited exceptions, those activities be governed by a Staff-approved quality assurance program.

CONSTRUCTION PERMIT: AUTHORITY OF PERMIT HOLDER

Under normal circumstances, the holder of a construction permit may engage in construction activities in accordance with the principal architectural and engineering criteria and environmental commitments set forth in the application for the facility and the construction-permit hearing record, without seeking prior approval of NRC Staff.

CONSTRUCTION PERMIT: AUTHORITY OF PERMIT HOLDER

When a construction permit holder undertakes construction activities, it does so at its own risk; the construction is subject to Commission approval before an operating license may be granted. 10 C.F.R. §50.57.

TECHNICAL ISSUE DISCUSSED:

Quality Assurance

MEMORANDUM AND ORDER (Imposing Certain Interim Conditions Pending Issuance of Partial Initial Decision)

Pending before this Licensing Board are consolidated proceedings arising out of the NRC Staff's December 6, 1979 Order Modifying Construction Permits No. CPPR-81 and No. CPPR-82 (OM proceeding), and the application by Consumers Power Co. for operating licenses for Midland Nuclear Power Plant, Units 1 and 2 (OL proceeding).¹ The facility, currently under construction, consists of two pressurized water reactors located in Midland, Michigan.

The Modification Order was generated as a result of the excessive settlement which occurred with respect to the facility's diesel generator building and other plant structures. Hearings which have been held to date concern the soils settlement issues raised by the Modification Order, as well as related contentions of intervenors in each of the proceedings. (The majority of the soils settlement contentions have been sponsored by Ms. Barbara Stamiris, an intervenor in the OM proceeding.) As reflected in our Memorandum² of October 2, 1981, we have determined to issue separate partial initial decisions dealing with various aspects of the soils issues. The first, now under preparation, deals with quality assurance/quality control (QA/QC) and management attitude issues, as delineated in the October 2, 1981 Memorandum. With limited exceptions, the record on these matters was closed on February 19, 1982, following some thirty-five days of hearings.³ The second will deal with proposed remedial actions to correct the soils settlement problems. Hearings on these matters are not yet completed, partially as result of the as-yet developing positions of all parties on these questions.

With respect to the QA/QC and management attitude issues, proposed findings of fact and conclusions of law, and supplemental proposed findings and conclusions covering matters as to which the record was reopened,

¹ The proceedings were consolidated at the request of Consumers Power Co., the Applicant in the OL proceeding and the Licensee in the OM proceeding (hereinafter referred to as "Consumers"). See Prehearing Conference Order, dated October 24, 1980 (unpublished).

² Memorandum (Concerning Telephone Conference Call of September 25, 1981 and Applicant's Motion for Partial Decision), dated October 2, 1981 (unpublished).

³ Certain aspects of these issues will remain open until our second partial initial decision.

have been received from all interested parties, and Consumers has just recently filed its replies to each of the proposed and supplemental proposed findings and conclusions of the other parties. During the course of our review of these various filings, as well as of the entire record, we have determined that certain conditions governing further construction, as set forth in Section VI of this Memorandum and Order, should be put into effect immediately, pending the completion of our review and the issuance within approximately two or three months of our first Partial Initial Decision.⁴ Our reasons follow.

I. Background

Under construction permits such as are in effect for the Midland plants, a permittee may normally engage in construction activities in accordance with the principal architectural and engineering criteria and environmental commitments set forth in the application for the facility and the construction-permit hearing record, without seeking prior approval of the NRC Staff. The permittee undertakes such activities at its own risk; they are subject to Commission approval before an operating license may be granted. See 10 CFR §50.57; *Cf. Northern Indiana Public Service Co.* (Bailly Generating Station, Nuclear-1), CLI-79-11, 10 NRC 733 (1979), *reversed on other grounds, sub nom. People of the State of Illinois v. NRC* (D.C. Cir. No. 80-1163, July 1, 1981). The December 6, 1979 Modification Order would have modified this regime by prohibiting certain construction activities with respect to safety-related structures and systems affected by the soils settlement problems which have been aired in the ongoing consolidated proceeding. The prohibited activities could not be undertaken absent (1) submission of an amendment to the application seeking approval of remedial actions, and (2) issuance of an amendment to the construction permits authorizing the remedial actions.⁵ The Modifica-

⁴ This procedure has been previously utilized by the Appeal Board with respect to these very same reactors. ALAB-106, 6 AEC 182 (1973).

We note that, in a telephone conference call on April 28, 1982, the Staff indicated that it might reconsider certain earlier testimony expressing reasonable assurance that Consumers' QA program will be appropriately implemented with respect to future soils construction activities (Keppler, prepared testimony, p. 9, fol. Tr. 1864). It requested that we cancel certain near-term hearings which we had scheduled, and we did so. Memorandum and Order (Cancelling Evidentiary Hearings and Conference of Counsel or Representatives), dated April 28, 1980 (unpublished). As a result, our first Partial Initial Decision could be delayed beyond the time frame we are now projecting.

⁵ Modification Order, Part IV. The Modification Order has been admitted into evidence as Stamiris Exh. 3, Attachment 15 (Tr. 2479).

tion Order further provided that a hearing could be requested by Consumers or other interested person and, if it were, the Order would go into effect only as a result of an order made following the hearing.⁶

The construction activities which the Modification Order would have prohibited consist of the following:⁷

- (a) any placing, compacting, or excavating soil materials under or around safety related structures and systems;
- (b) physical implementation of remedial action for correction of soil-related problems under and around these structures and systems, including but not limited to:
 - (i) dewatering systems
 - (ii) underpinning of service water building
 - (iii) removal and replacement of fill beneath the feedwater isolation valve pit area
 - (iv) placing caissons at the ends of the auxiliary building electrical penetration areas
 - (v) compaction and loading activities;
- (c) construction work in soil materials under or around safety-related structures and systems such as field installation of conduits and piping.

Had the hearings in the OM proceeding not been requested, Consumers could not have undertaken any of the foregoing activities without submitting an amendment to its application and obtaining construction- permit amendments authorizing such activities. Since the hearing was requested, the normal construction permit authority remains in effect, and no construction permit amendment (or other NRC authorization) needs to be sought in order for Consumers to engage in the activities in question.

Both the Modification Order (Part V) and the Commission's Notice of Hearing of March 14, 1980 (45 *Fed. Reg.* 18214, March 20, 1980) stated that this Board is to consider and decide the following issues:

- (1) Whether the facts (concerning quality deficiencies) set forth in Part II of the Order are correct; and
- (2) Whether that Order should be sustained.

II. Facts Underlying Modification Order

One of the bases for the Modification Order was the allegation that there had been a breakdown in quality assurance related to soils. Another

⁶ Modification Order, Part V.

⁷ Modification Order, Part IV.

basis was that Consumers had not provided the information which the Staff and its consultants required to permit a thorough safety review of proposed remedial actions.⁸ As a result of these deficiencies, the Staff concluded that it did not have reasonable assurance that the safety-related portions of the Midland facilities would be so constructed that they could be operated without undue risk to public health and safety.

With regard to the first basis, Consumers and the Staff entered into a stipulation on June 5, 1981, in which Consumers conceded that prior to December 6, 1979 there were quality assurance deficiencies related to soil construction activities. Consumers agreed not to contest the Staff's conclusion that these deficiencies constituted a breakdown in quality assurance with respect to soils placement at Midland, and it acknowledged that the deficiencies constituted an adequate basis for issuance of the Order.⁹ With regard to the second basis for the Order, the Staff and Consumers entered into two additional stipulations in which Consumers agreed not to contest that, as of December 6, 1979, the NRC Staff had insufficient information to evaluate the proposed remedial actions for the auxiliary building, for the borated water storage tanks and underground piping.¹⁰

As a result of these stipulations, we are able at an early stage of our review to conclude, with respect to the first hearing issue, that the facts set forth in Part II of the Modification Order (to the extent they relate to soils QA deficiencies and the adequacy on December 6, 1979 of the Staff's information to review remedial actions) are correct and constituted an adequate basis for issuance of the Order. Consumers, the NRC Staff, and intervenor Barbara Stamiris each submitted proposed findings to this effect.¹¹

III. Facts Giving Rise to Interim Requirements

We have not yet completed our review of the second hearing issue — *i.e.*, whether and, if so, to what extent, the Modification Order should be

⁸ We are here making no findings and reaching no conclusions with respect to a third basis for the Order, an alleged material false statement. Hearings on that subject are not yet completed although we have heard testimony on the management-attitude aspects of the alleged statement.

⁹ Applicant/Staff Joint Exh. 1, following Tr. 1175, admitted at Tr. 1188.

¹⁰ Applicant/Staff Joint Exhs. 2 and 3, dated December 1, 1981 and February 9, 1982, respectively (Tr. 5447, 7164).

¹¹ Consumers Proposed Findings ¶ 35; Staff Proposed Findings, ¶¶ 236-237; Stamiris Proposed Findings, ¶ 10.

sustained. Consumers has described this issue as "whether the safety issues [giving rise to the facts set forth in Part II of the Modification Order] have been resolved so that the quality assurance program with respect to soils is now being properly implemented and there is reasonable assurance such implementation will continue through the construction process."¹² Ms. Stamiris has described it somewhat similarly, as "whether as a result of revisions, improved implementation, and other factors, this Board has reasonable assurance that the QA and QC programs will be appropriately implemented with respect to future soils construction and remedial activities".¹³ However, they reach different answers to this question.

Consumers asserts that, as a result of organizational and procedural changes which it has put into effect since the issuance of the Modification Order, its QA program is now being properly implemented. It urges us to find reasonable assurance that the future soils construction activities including the remedial actions taken as a result of inadequate soils placement will be accomplished in accordance with QA principles of public health and safety.¹⁴ On the other hand, although Ms. Stamiris concedes that Consumers' organizational changes represent a "positive response",¹⁵ she nonetheless concludes that the implementation of QA at Midland is inadequate¹⁶ and that the same kind of problems and weaknesses currently exist as had lead to problems in the past.¹⁷ She would have us put the Modification Order into effect and shut down soils-related construction immediately.¹⁸ The NRC Staff also gave its reasonable assurance that the QA program would be properly implemented,¹⁹ although at least one of its witnesses expressed some reservations (Tr. 2441-42 (Gallagher)).²⁰

We do not at this point in our review express any opinion with respect to those positions—except to note that none of them is baseless and all have evidentiary support. The resolution of this broad issue will, as we have seen, affect the degree to which and the manner in which soils-related

¹² Consumers Proposed Findings, ¶ 37 [*sic*; should be 36].

¹³ Stamiris Proposed Findings, ¶ 10.

¹⁴ Consumers Proposed Findings, ¶¶ 81-83.

¹⁵ Stamiris Proposed Findings, ¶ 222.

¹⁶ Stamiris Proposed Findings, ¶ 221.

¹⁷ Stamiris Proposed Findings, ¶ 225.

¹⁸ Stamiris Proposed Findings, ¶ 254; Part III.C.

¹⁹ NRC Staff Proposed Findings, ¶ 375.

²⁰ Mr. Gallagher stated that he supported Mr. Keppler's conclusions concerning implementation of the QA program "entirely" but added that he "would like to see some other things to be included" (Tr. 2455). See also fn. 4, *supra*, ¶ 2.

construction activities (and particularly remedial actions) will be permitted to continue.²¹

As background for our approach to this question, we deem it important to note that the QA/QC deficiencies which are addressed by the Modification Order are not the first instances where Consumers has experienced difficulty in properly implementing its QA/QC program. The Appeal Board pinpointed one such instance in ALAB-106 (fn. 4, *supra*), and it imposed conditions designed to alleviate the deficiencies which it found to exist. Later, questions were raised concerning the QA/QC organization being utilized for this facility. ALAB-132, 6 AEC 431 (1973); ALAB-147, 6 AEC 636 (1973); ALAB-152, 6 AEC 816 (1973). Subsequently, the Staff issued a show-cause order which was founded on other QA/QC deficiencies, and additional corrective actions were mandated. ALAB-283, 2 NRC 11 (1975), *clarified*, ALAB-315, 3 NRC 101 (1976). During that show-cause proceeding, the Appeal Board remarked that "non-compliance with the Commission's quality assurance regulations is * * * a problem which has plagued the construction of this facility." ALAB-270, 1 NRC 473, 476 (1975).²²

With this history before us, early in this proceeding we expressed concern about the adequacy of the potential safety impact of ongoing construction activities (Tr. 754-55). On the opening day of the hearing, the Staff responded to our inquiry by presenting testimony regarding soils-related construction of the type that would be going on during the period of time before we could issue a decision governing construction encompassed by the Modification Order.²³ From that testimony, it appeared to us that consumers was at that time consulting with and seeking approval of the Staff before engaging in any of the construction activities there under consideration—*i.e.*, installation of 20 permanent back-up interceptor wells in the area near the Service Water Structure and the Circulating Water Intake Structure, and surcharging of the two valve pits which are adjacent to each of the Borated Water Storage Tanks.²⁴ Although all of the

²¹ As we have pointed out (pp. 4-5, *supra*), the most stringent condition we could impose on those activities under the Modification Order would be to prohibit such activities pending submission of an amendment to the applications and issuance of construction-permit amendments authorizing remedial action. All or any portion of that condition could be put into effect. *Cf. Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), CLI-80-10, 11 NRC 438 (1980); *Wisconsin Electric Power Co.* (Point Beach, Unit 1), CLI-80-38, 12 NRC 547 (1980).

²² See also Board Exhibits 1A and 1B (Tr. 1875), which contain a summary of problems experienced at Midland since the start of construction.

²³ Testimony and Supplemental Testimony of Darl S. Hood, both following Tr. 1097.

²⁴ Hood, prepared testimony, p. 2. Those were the only two soils-related activities then under way or planned to be undertaken by Consumers in the near term (Tr. 1112).

outstanding questions raised by the Staff concerning those proposed remedial activities had not then been resolved, the Staff expressed its "reasonable assurance" that the activities would be performed in an acceptable manner.²⁵ We interpret that reasonable assurance conclusion as premised upon Consumers' affording the Staff the opportunity to review the proposed resolution of the unresolved questions.²⁶

In addition, Consumers advised us that, in February, 1980, it had voluntarily committed not to proceed with further remedial actions without Staff review and concurrence.²⁷ (Insofar as the record reflects, this commitment appears to have been an oral one, not reduced to writing prior to its incorporation into testimony in this proceeding.) That Consumers will provide the Staff with sufficient information to permit a thorough safety review is inherent in this commitment.

We find no indication in the record that Consumers has failed to honor this commitment. For its part, the Staff agreed that it would accept information through meetings and presentations rather than an amendment to the application. Beyond the two matters about which the Staff initially testified, the Staff has utilized this arrangement to approve such activities as construction of access shafts and a freezeway in preparation for underpinning the auxiliary building and feedwater isolation valve pits,²⁸ and any drilling activities near seismic Category I underground utilities and structures (Tr. 5485-86). During the hearing, Consumers agreed that the commitment would be extended to the matter of crack evaluation, a question which Consumers judged to be less important than does the Staff (Tr. 5735-38). As far as we are aware, certain additional remedial actions to which the commitment is being applied are currently under review or in progress.

From the present stage of our review, it appears that Consumers' voluntary agreement has resulted in adequate Staff surveillance of the proposed remedial actions covered thereby, prior to Consumers' commencement of the remedial actions. Consumers itself has acknowledged the usefulness to it of its consultation with the Staff prior to the initiation of remedial activities (Tr. 5660-61). At this time, we are making no changes to the procedures utilized under this arrangement.

It is important to note, however, that Consumers' commitment does not

²⁵ Hood, supplemental testimony, p. 3. Subsequently, on December 10, 1981, the Staff approved the installation of 5 additional temporary dewatering wells. Staff Exh. 13 (Tr. 6901).

²⁶ Hood, prepared testimony, p. 3; supp. test., pp. 2, 3; Tr. 1113-14, 1119.

²⁷ Testimony of Gilbert S. Keeley, fol. Tr. 1163, p. 13.

²⁸ Letter dated November 24, 1981, from Darl Hood (NRC) to James W. Cook (CPC) (Staff Exh. 5, Tr. 5467).

extend to all the activities which Part IV of the Modification Order would have prohibited (Tr. 1202-1212, 1390). The scope of the oral commitment is not clearly defined. While it appears essentially to cover those major remedial actions within the scope of Section 1(b), but not activities falling within Sections 1(a) and 1(c), of Part IV of the December 1979 Order (Tr. 1420-1422), there is some ambiguity whether certain activities may fall within Section 1(b) or one of the other categories.

Although we have no objection to the Staff/Consumers working relationship for those portions of the remedial work to which the commitment applies, several matters of record cause us to be dissatisfied with the limited scope of activities covered. More specifically, as a result of the matters described in this section of this Memorandum and Order, augmented by the related information appearing in Part IV, we are of the view that certain activities outside the scope of Consumers' commitment but within the coverage of the prohibition in the Modification Order should be subject to prior Staff review and approval.

The first of these matters which gives us concern is that of underground piping. Consumers proceeded with work associated with underground piping which carries cooling water essential to safety without seeking or receiving formal Staff concurrence (Tr. 7784, 7788a). This work would clearly have been prohibited under Part IV, Section 1(c) of the Modification Order, and it could also be interpreted as falling within Section 1(b)(Tr. 7788c). The record is confusing as to whether the Staff regarded Consumers' commitment as in fact covering that type of remedial action (Tr. 7781-7783, 7788a-7790, 7894-7901).²⁹ The Staff expressed the opinion that underground piping should be covered by the commitment (Tr. 7788c, 7789, 7899). Underground piping was of concern to the Staff prior to its issuance of the Modification Order.³⁰ One reason we believe it essential that safety-related activities such as the rebedding of piping should have prior full Staff review and concurrence is that once such work is performed and the piping then recovered with earth, it is no longer accessible for inspection for such concerns as have been identified during the course of this hearing—*e.g.*, corrosion (Tr. 7683-86, 7827-35), deformation (Tr. 7913-14), quality of foundation soils (Tr. 7911), pipe welds (Tr. 7652-56), and condition of pipe wrapping materials (Tr. 7860, 7914-15). Therefore, adequate QA/QC surveillance is fundamental to assuring safety. The Staff has expressed its desire, in fact, to review such matters as compaction criteria and procedures prior to the work taking place, and to be able to inspect the work while being performed (Tr. 7899). Moreover, the Staff

²⁹ We disagree with Consumers' response to Ms. Stamiris' Proposed Findings and Conclusions, ¶ 8, pp. 6-7.

³⁰ I.E. Rept. 79-06, dated April 4, 1979 (Stamiris Exh. 3, Att. 8, at p. 5).

has stated that it had insufficient soil-profile information to evaluate distortion in pipes buried in soils which have settled.³¹

The second reason for our requiring further Staff review and approval prior to the start of soils-related construction differs from the first in that it does not stem from a single type of construction activity. Rather, it pervades the entire spectrum of soils-related construction activities. As a result of Board questioning, we have some doubt whether, in the absence of Staff review and approval, Consumers would carry out certain remedial soils activities using appropriate QA procedures and principles. Its witnesses presenting the remedial plans for the auxiliary building were unsure of the manner in which QA principles would be applied to that operation (Tr. 5530-32). With respect to the engineering of the remedial actions, Consumers was able to describe the QA procedures it had already followed (Tr. 5718-20), but it also indicated that it did not consider the engineering a problem area and was therefore not applying any specialized procedures to those activities (Tr. 5622)—despite the fact that it had to formulate and rework its plans four different times before it obtained a system acceptable to the Staff (Tr. 5647-58). Consumers does not appear to have obtained Staff approval with respect to the engineering QA procedures which it had followed (Tr. 5750). Furthermore, Consumers seems to have a tendency to treat as many structures as possible as non-Q-listed (and, hence, as not subject to QA controls) (Tr. 5626, 5671-72).

For these reasons, we are not completely satisfied as to the extent to which QA plans and controls are to be applied by Consumers to underpinning activities. In particular, we are concerned about areas adjacent to, but not necessarily directly under, safety-class structures. These activities include boring of large diameter, closely spaced holes for soldier piles which would penetrate low shear-strength soil layers at elevations below the foundations of adjacent safety-class structures (Tr. 5674-79; 5765-71), and essentially all underpinning activities beneath the turbine building the failure or tilting of which might influence the safety or future seismic resistance of the adjacent safety-class structures (Tr. 6083-85; 7125-27). These potential QA/GC gaps lead us to believe that, at least in the near future, the commencement of safety-related activities of this type should be subject to the Staff's approval—particularly as to whether specific activities are to be covered or not covered by an appropriate QA plan.³²

³¹ Kane, prepared testimony, fol. Tr. 7752, p. 3.

³² We understand that Consumers later indicated that monitoring instruments would be placed before commencing underpinning activities to measure horizontal movements between the turbine building and adjacent structures "in response to questions raised by the Atomic Safety and Licensing Board". Memorandum dated March 11, 1982 from Darl Hood, Summary of March 8, 1982 Telephone Conversation Regarding Soil Spring Stiffnesses for Auxiliary Building Underpinning and Phase II Construction.

IV. Related Matters Substantiating The Need for Interim Conditions

Certain matters which have been the subject of notifications by various parties to the Board tend to accentuate what we regard as the need for the interim conditions we are imposing. These matters have not yet been the subject of evidentiary hearings, and we express no final view as to their accuracy or import. Nonetheless, we regard these matters as closely relevant to the facts on which we have taken evidence and pertinent to our determination that interim conditions should be imposed.

As one example of this type, representing an activity we believe should be covered by the commitment, the Board has been informed by way of a Consumers' Non-Conformance Report that a 42-inch diameter hole was drilled to a depth of 40 feet within the "Q" fill area, apparently without proper authority; without the development of, or adherence to, written procedures; without the participation of the On-Site Geotechnical Engineer; and without adequate QA/QC surveillance, if any.³³ We hasten to point out that we have not yet heard evidence on this report and express no view as to its accuracy. It appears, however, to describe the type of activity which is encompassed by the prohibition in Part IV, Section 1(a) of the Modification Order. Moreover, if the NCR is accurate, the activity would constitute a prime example of the kind of work which we believe should be subject to prior Staff review and concurrence.

Additionally, we have also recently been notified of loose sands located in the plant fill north of the Service Water Structure and Circulating Water Intake Structure. This loose sand reportedly underlies about 500 feet of seismic Category I pipe. We understand that Consumers has decided to remove and replace this material to avoid potential liquefaction problems.³⁴ Once again, we express no view as to the validity of this information. But considering the vagueness as to the limits of Consumers' commitment and the apparent potential effect on public safety of these construction activities should the plant later be allowed to operate, we deem it necessary at this time to eliminate any uncertainty and to require that any remedial actions intended to rectify this matter receive full Staff review and concurrence before being undertaken.

Finally, the Board notes that the Staff has disagreed with Consumers³⁵

³³ NCR # M01-4-2-008 Rev. 1, dated February 25, 1982, transmitted to the Board and parties by letter dated March 12, 1982, from James E. Brunner, CPC. The Board requested that it be provided with audit reports of this type (Tr. 5975-76).

³⁴ Memorandum from Darl Hood, Notification of Loose Sands Beneath Service Water Piping, March 16, 1982. See also letter from James W. Cook to Harold R. Denton, Additional Information Concerning Safety Grade Buried Piping, March 16, 1982.

³⁵ Memorandum dated March 12, 1982, from Darl Hood, subject: Summary of March 10, 1982 Meeting Concerning Quality Assurance To Be Applied To Remedial Foundation Work.

over the extent of QA coverage and control of the underpinning activities beneath the safety-class and adjacent non-safety class buildings. The disagreement apparently has been resolved by Consumers' agreeing that essentially all underpinning activities would be subject to Q-controls, except for certain already completed activities and certain agreed-upon non-critical activities.³⁶

Although the Board recognizes that these disagreements may reflect genuine differences of interpretation of requirements in Appendix B to 10 CFR 50, we deem it important to public safety that, pending the completion of our QA review, the Staff's more conservative interpretation should apply to remedial work activities, some of which are, or shortly will be, in progress. Accordingly we have made the elements of that agreement part of this Interim Order. Again, while we express no views as to the validity of those matters brought to our attention outside the actual hearings, they represent the kinds of issues that were alleged in the December 6, 1979 Modification Order, and that were the subject of ongoing efforts by the Staff and Consumers to resolve them.

V. Description of Interim Requirements

As a result of the various safety problems which we have described in Section III, above, the potential and related problems described in Section IV, above, and the imminence of the commencement of additional safety-related work activities on remedial measures for the soils settlement problems which we have been considering, we find it necessary to act now to remove ambiguities in Consumers' commitment to obtain prior Staff approval for remedial measures. Pending the completion of our review of the record and issuance of a partial initial decision, we are requiring that the construction permits be amended to prohibit (in the absence of Staff approval) the same activities as would have been prohibited by Section IV of the Modification Order. (We are updating the requirement to take account of certain developments which have occurred since December 6, 1979.) This requirement would not apply to any of the activities as to which the NRC has already given its approval. Nor does it dictate the manner in which the Staff may exercise its review—*i.e.*, whether piecemeal (individual construction steps) or as an integrated package. In addition, for the reasons we have outlined, we are requiring that certain of these

³⁶ Letter, James W. Cook (CPC) to J. G. Keppler (NRC), dated April 5, 1982, subject: Quality Assurance for Remedial Foundation Work.

activities be governed by a QA plan.³⁸ We have pointed out that some of the material which we have considered in this order has not yet been the subject of a completed evidentiary hearing; indeed, the scope of our QA requirement is premised in part upon an apparent agreement between Consumers and the Staff contained in material of this sort. Letter of James C. Cook, fn. 36, *supra*. We expect Consumers and the NRC Staff to present testimony on these open items at a later evidentiary session.

We stress that in our forthcoming Partial Initial Decision we will reexamine the terms and conditions which we are here imposing on an interim basis. At that time, we may reaffirm, expand or remove them. Until such time, however, we find that the Modification Order should be made effective to the extent which we have described. We stress that we are *not* at this time requiring the submission or approval of any amendments to the applications for construction permits (as provided by the Modification Order). In our opinion, the Staff consultation and approval which we are requiring will achieve the substantive results we believe necessary without adding certain procedural requirements of an application for a construction permit amendment which, in the present context, do not appear to be necessary to attain the safety goals which we believe should be achieved.

VI. Order

Based on the foregoing, it is, this 30th day of April, 1982
ORDERED

That the Director of Nuclear Reactor Regulation, in accordance with 10 CFR §2.764(b), is authorized to amend Construction Permits CPPR-81 and CPPR-82 as follows:

- (1) Construction Permits CPPR-81 and CPPR-82 shall be amended to require that the permit holder obtain explicit prior approval from the NRC Staff (to the extent such approval has not already been obtained) before proceeding with the following soils-related activities, and that these activities, with the exception of those already approved by the NRC, and those that the Staff agrees are not

³⁸ To require a QA plan for safety-related remedial soils construction activities is consistent with the requirements of 10 CFR §50.34(a)(7). We note that the large-scale underpinning and other remedial activities which are being undertaken are sufficiently distinct from the activities contemplated during the construction-permit review as to warrant a supplementation of the applicable QA program.

critical, shall be controlled by a Staff-approved Quality Assurance Plan:

- (a) any placing, compacting, excavating, or drilling soil materials around safety-related structures and systems;
 - (b) physical implementation of remedial action for correction of soil-related problems under and around safety-related structures and systems, including but not limited to:
 - (i) dewatering systems
 - (ii) underpinning of service water building
 - (iii) removal and replacement of fill beneath the feedwater isolation valve pit areas, auxiliary building electrical penetration areas and control tower, and beneath the turbine building
 - (iv) placing of underpinning supports beneath any of the structures listed in (iii) above
 - (v) compaction and loading activities;
 - (c) construction work in soil materials under or around safety-related structures and systems such as field installation, or rebedding, of conduits and piping.
- (2) Paragraph (1) above shall not apply to remedial actions approved by the NRC Staff prior to the effective date of this Order, nor to any exploring, sampling, or testing of soil samples associated with determining actual soil properties on site which has the approval of the Director of Region III, Office of Inspection and Enforcement. These testing activities, however, shall be controlled by a Staff-approved Quality Assurance plan which includes procedures for controlling excavation or drilling activities more than 6-feet deep in "Q" areas.

In accordance with 10 CFR 2.760, 2.762, 2.764(a), 2.785 and 2.786, this Memorandum and Order shall be effective immediately upon issuance and shall constitute the final action of the Commission on the matters considered herein forty-five (45) days after issuance, subject to any review pursuant to the above-cited Rules of Practice. Exceptions to this Memorandum and Order may be filed by any party within ten (10) days after its service. A brief in support of the exceptions shall be filed within thirty (30) days thereafter (forty (40) days in the case of the NRC Staff). Within thirty (30) days of the filing and service of the brief of the

appellant (forty (40) days in the case of the NRC Staff), any other party may file a brief in support of, or in opposition to, the exceptions.

**THE ATOMIC SAFETY AND
LICENSING BOARD**

**Charles Bechhoefer, Chairman
ADMINISTRATIVE JUDGE**

**Dr. Frederick P. Cowan, Member
ADMINISTRATIVE JUDGE**

**Ralph S. Decker, Member
ADMINISTRATIVE JUDGE**

**Dated at Bethesda, Maryland
this 30th day of April, 1982.**

Judge Jerry Harbour, who has served as a technical interrogator and an alternate Board member during portions of the hearings concerning management attitude and quality assurance matters, and who has replaced Judge Decker for the forthcoming segments of the consolidated OL-OM proceeding (with the exception of the first Partial Initial Decision and orders, such as this one, which are integral to that Decision), supports the rulings and reasoning included in this Memorandum and Order.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Lawrence Brenner, Chairman
Dr. Jerry Harbour
Dr. Peter A. Morris**

In the Matter of

Docket No. 50-201 OLA

**NUCLEAR FUEL SERVICES, INC.,
AND
NEW YORK STATE ENERGY RESEARCH
AND DEVELOPMENT AUTHORITY
(Western New York Nuclear
Service Center)**

April 30, 1982

The Licensing Board rules on two independent hearing requests on license amendment No. 31. The Board grants the motion of Nuclear Fuel Services, Inc. to withdraw its request for hearing, concluding that even though subsequently issued license amendment No. 32 clearly affected the same subject matter as license amendment No. 31, the Board's exercise of its power to modify amendment No. 32, pursuant to 10 CFR §2.717(b) was unnecessary on these facts. The Board also denies the hearing request of Dr. Irwin D. J. Bross, in its entirety, concluding that under the West Valley Demonstration Project Act, the Commission lacks the subject matter jurisdiction to consider those issues related to the Department of Energy's conduct of the West Valley Project which Dr. Bross seeks to litigate.

LICENSING BOARDS: JURISDICTION

Pursuant to 10 CFR §2.717(b), a licensing board may modify, as appropriate for purposes of pending proceeding, any order or action of staff related to the proceeding's subject matter (*Cincinnati Gas and Electric Co.* (Wm. H. Zimmer Nuclear Station), LBP-79-24, 10 NRC 226, 229-230 (1979)).

RULES OF PRACTICE: STANDING

A license amendment which grants a co-licensee precisely the relief which it seeks as a party to a pending adjudicatory proceeding deprives that party of standing to assert its claims in the adjudicatory proceeding. Such a licensing amendment is integrally related to the subject matter of the pending adjudicatory proceeding and may be modified by the Licensing Board hearing that proceeding, as it deems appropriate.

LICENSING BOARDS: JURISDICTION; NOTICE OF HEARING

Where it has been held that 10 CFR §2.717(b) applies, a notice of hearing relating to a licensing amendment need not be explicitly expanded as a prerequisite to the licensing board in that case exerting jurisdiction over a subsequent license amendment related to the same subject matter as the earlier proceeding.

RULES OF PRACTICE: STANDING

In determining hearing and/or intervention rights under section 189(a) of the Atomic Energy Act of 1954, the Commission will apply judicial concepts of standing. *Public Service Company of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), CLI-80-10, 11 NRC 438, 439 (1980).

RULES OF PRACTICE: STANDING

To have "standing" in a court, one must allege both an interest arguably within the zone of interests protected by the statute and an injury that either has occurred or would arguably result from the action complained of. Under this "injury in fact" test a mere academic interest in a matter, without any real impact on the person asserting it, will not confer standing. *Portland General Electric Company* (Pebble Springs Nuclear Plant, Units 1 and 2), CLI-76-27, 4 NRC 610, 613 (1976).

NUCLEAR REGULATORY COMMISSION: JURISDICTION

The NRC lacks subject matter jurisdiction to consider the conduct of the West Valley Demonstration Project by the Department of Energy in formal licensing proceedings. Pursuant to Section 2(c) of the West Valley

Demonstration Project Act, Pub. L. No. 96-368, 94 Stat. 1347 (1980), NRC's review of the Department of Energy's conduct of the demonstration project is to be conducted on an informal basis.

ENERGY REORGANIZATION ACT: NRC LICENSING OF DOE FACILITY

Section 202 of the Energy Reorganization Act of 1974 specifically limits NRC jurisdiction over DOE-operated high-level radioactive waste storage facilities to those which will be operated on a "long-term" basis, meaning "tens to hundreds of years."

WEST VALLEY DEMONSTRATION PROJECT ACT: RIGHT TO HEARING

While DOE's conduct of the West Valley Demonstration Project itself may not be the subject of formal NRC licensing proceedings, DOE's conduct of the subsequent decontamination and decommissioning of the West Valley facility may be subject to full NRC regulation and licensing requirements. West Valley Demonstration Project Act, §2(a)(5), Pub. L. No. 96-368, 94 Stat. 1347 (1980).

APPEARANCES

Nuclear Fuel Services, Inc.:

Orris S. Hiestand, Jr., George L. Edgar, Frank K. Peterson, Esquires, Morgan, Lewis & Bockius.

New York State Energy Research and Development Authority:

Carmine Clemente, Howard A. Jack, Esquires; Phillip H. Gitlen, Esquire, White, Osterman & Hanna.

Dr. Irwin D. J. Bross, pro se.

United States Department of Energy:

R. Tenney Johnson, Warren E. Bergholz, Jr., Gregory Fess, Esquires.

United States Nuclear Regulatory Commission Staff:

James R. Wolf, John F. Klucsik, Esquires.

**MEMORANDUM AND ORDER
RULING ON REQUESTS FOR HEARING ON
OPERATING LICENSE AMENDMENT**

The Board rules on the separate requests for hearing by Nuclear Fuel Services, Inc. (NFS) and Dr. Irwin D. J. Bross. The Board grants the withdrawal of its request for hearing by NFS, and finds that it lacks jurisdiction to consider the claims of Dr. Bross regarding the conduct by DOE of a radioactive waste management demonstration project.

Background

This proceeding relates to a license amendment (Change No. 31) issued by the NRC Staff on September 30, 1981,¹ which was to permit the New York State Energy Research and Development Authority (NYSERDA) and Nuclear Fuel Services, Inc. (NFS) to transfer temporarily their respective interests in the Western New York Nuclear Service Center at West Valley, New York² to the United States Department of Energy (DOE) in accordance with the West Valley Demonstration Project Act, Pub. L. No. 96-368, 94 Stat. 1347 (1980) (West Valley Act).³

NFS, which was co-holder with NYSERDA of the license for the West Valley facility,⁴ opposed Change No. 31 as being detrimental to its legal and economic interests. NFS asserted that while the amendment deprived it of any rights which it may have had under its license to control activities at the Center during DOE's performance of the demonstration project at the site, it had not terminated its obligations or liabilities as a licensee for

¹ 46 Fed. Reg. 49237 (October 6, 1981).

² The Western New York Nuclear Service Center, located about 30 miles south of Buffalo, was the earliest effort in commercial nuclear fuel reprocessing in the United States. NFS leased and operated the site, which was then owned by the New York State Atomic and Space Development Authority. NYSERDA is the successor to that agency's interests in the Center. H.R. No. 96-1100(I), 96th Cong., 2d Sess. 6 (June 12, 1980), *reprinted in* [1980] U.S. Code Cong. & Ad. News 6017, at 6020. NFS, however, owned those portions of the facility in which actual chemical processing was to occur. Provisional Operating License No. CSF-1, §2.

³ The West Valley Act authorized the Department of Energy to carry out a high level radioactive waste management demonstration project at the Center, for the purpose of demonstrating solidification techniques which can be used for preparing high level radioactive waste for disposal. West Valley Act, *supra*, §2(a).

⁴ Provisional Operating License No. CSF-1, issued by the Atomic Energy Commission on April 19, 1966.

any danger or harm to the public health and safety which might arise during or as a result of DOE's activities at the West Valley site.⁵

On October 6, 1981, NFS submitted an application for a further license amendment, which, if granted, would have terminated all of NFS's rights and responsibilities under the license upon DOE's assumption of exclusive possession and control of the facility.⁶

Subsequently, on October 13, 1981, NFS filed with the Commission a request for hearing with respect to the conditions imposed by Change No. 31, asserting that the amendment had altered its rights and responsibilities under its license and had adversely affected its interests. Stating its concern that its transfer of the West Valley facility to DOE, as required by Change No. 31, would be in violation of Federal law, NFS sought to have the Commission determine both "NFS's rights and responsibilities under its license and NRC's authority to issue the amendment effectuating the transfer"⁷

At the same time, NFS moved that the Commission postpone the effectiveness of the license amendment, asserting that, as a licensee, it had an absolute right, pursuant to 10 CFR §2.204 (1981), to a prior hearing before the amendment could be made effective.

Through a letter to NRC Secretary Samuel J. Chilk dated October 16, 1981, Dr. Irwin D. J. Bross, Director of Biostatistics at Buffalo's Roswell Park Memorial Institute, also requested that the Commission hold a hearing with respect to Change No. 31. Dr. Bross stated his concern as a resident and a "health bureaucrat" the "misguided" DOE efforts to clean up the highly radioactive sludge contained in steel tanks at the West Valley site by "violent agitator action" could endanger the health and safety of residents of Western New York State. He further asserted that DOE is unable to police its own operations and that there would be no Federal protection of the public health and safety if NRC determines that,

⁵ Letter from NFS President Ralph W. Deuster to Richard E. Cunningham, Director, Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, dated September 11, 1981.

⁶ Notice of receipt of this proposed amendment was published at 46 Fed. Reg. 56086 (November 13, 1981).

As set out in the October 6, 1981 letter from NFS President Ralph W. Deuster to John G. Davis, Director of the U.S. NRC Office of Nuclear Material Safety and Safeguards, the proposed amendment provided for the termination of all NFS's rights and responsibilities under License No. CSF-1 upon DOE assuming exclusive possession and control of the facility.

Deuster further stated his understanding that NYSEDA was willing to join in this proposed amendment, provided that a settlement of NFS's and NYSEDA's contractual disputes was reached and signed simultaneously with the issuance of the proposed amendment.

⁷ "Licensee's (NFS's) Request For Hearing," October 13, 1981, at 6.

pursuant to the West Valley Act, it has no responsibility for supervising DOE cleanup operations.

In its November 6, 1981 Order and Notice of Hearing, CLI-81-29, 14 NRC 940 (1981), the Commission denied NFS's motion for a stay of the effectiveness of the license amendment. It further directed that the Chairman of the Atomic Safety and Licensing Board Panel establish a Licensing Board "to conduct an adjudicatory hearing in accordance with 10 CFR Part 2, Subpart G pursuant to the request of NFS and to review Dr. Bross' request for a hearing."⁸ By an order dated November 17, 1981, this Board was established for those purposes.

To aid the Board in understanding the relationship of this proceeding to collateral proceedings pending before both the Commission and the Federal Courts,⁹ and to clarify those issues on which a hearing had been requested, we directed, through our December 31, 1981 order (unpublished), that the parties provide us with information in the form of responses to a series of Board questions.

On January 11, 1982, the NRC Staff denied NFS's October 6, 1981 license amendment application, without prejudice, stating that the Staff wished to abstain from deciding matters which were at that time the subject of litigation before the United States District Court for the Western District of New York.¹⁰

⁸ 14 NRC at 943.

⁹ At the time, three connected matters were pending before the Federal Courts. The first was an action commenced by NFS on December 24, 1980 in the District Court for the Northern District of New York, seeking to enforce its asserted right to have NYSEKDA accept its surrender of possession of the West Valley facility pursuant to their lease agreement.

The second action was commenced by NYSEKDA in New York State Supreme Court in Cattaraugus County six days later, seeking to enjoin NFS from abandoning the low-level waste storage facilities at the Center (which were not to be transferred to DOE pursuant to the West Valley Act) and directing it to continue to maintain those facilities. The State court action was promptly removed to the U.S. District Court for the Western District of New York, and the Northern District case was subsequently transferred to the Western District.

On September 30, 1981, NYSEKDA changed its position and moved for partial summary judgment to require NFS to vacate that portion of the Center which was to be occupied by DOE. The District Court granted this motion, holding that under New York law, NYSEKDA has the right to *repossess* the Center upon the termination of its lease on December 31, 1980, and that no reasonable interpretation of this lease supported NFS's claim that NYSEKDA was required to accept NFS's *surrender* of possession after that date. On December 8, 1981, the U.S. Court of Appeals for the Second Circuit reversed that decision and remanded the matter to the Western District for trial or settlement.

The third Federal proceeding involved a petition filed by NFS in the District of Columbia Circuit of the U.S. Court of Appeals seeking to vacate the Commission Order issuing Change No. 31 on September 30, 1981, to declare the amendment a nullity, and to remand the case to the NRC with directions requiring that NFS be granted an opportunity for a prior hearing before any amendment to its license would become effective.

¹⁰ Letter from Richard E. Cunningham, Office of Nuclear Material Safety and Safeguards, U.S. NRC to Ralph W. Deuster, NFS, dated January 11, 1982.

Change No. 32

Subsequent to the Staff's denial of this license amendment application, however, we received letters dated February 4, 9, and 12, 1982 from NFS, NYSERDA, and the Staff, respectively, transmitting proposed and then issued Change No. 32. The effect of this license amendment was to terminate the authority and responsibility of NFS under the license, effective upon (1) NYSERDA's acceptance of NFS's surrender of the West Valley facility; (2) DOE's assumption of exclusive possession of the facility; and (3) settlement of those civil actions pending in the United States District Court for the Western District of New York.¹¹

Both NFS and Staff Counsel assert in their letters, using precisely the same language, that the Board was being provided with a copy of this license amendment merely "to keep the Board abreast of matters relating to license No. CSF-1" and that the ". . . amendment is not an issue before the Board."

NFS withdrew its October 13, 1981 request for a hearing on Change No. 31 the day before the Staff issued Change No. 32.¹² On February 18, 1982, NFS and NYSERDA signed the settlement agreement referenced in Change No. 32 and the Court approved this agreement on the following day. DOE assumed exclusive possession and control of the West Valley facility¹³ in accordance with the terms of Change No. 31 on February 25, 1982, thus accomplishing all preconditions to the effectiveness of Change No. 32.

In our February 19, 1982 memorandum and order (unpublished), we directed the participants to this proceeding to submit comments as to the

¹¹ See Notice of Issuance of Amendment to Facility License No. CSF-1, 47 Fed. Reg. 7352 (February 18, 1982).

¹² On the same day (February 11, 1982) NFS also moved for voluntary dismissal of its Petition for Review of the Commission's September 30, 1981 order (issuing Change No. 31) before the U.S. Court of Appeals (D.C. Circuit).

NFS's February 11, 1982 Withdrawal of Request for Hearing stated that "An additional amendment to that license, recently issued by the Nuclear Regulatory Commission, has removed NFS's objections to Change No. 31." NFS was apparently referring to Change No. 32 but seems to have beaten the NRC Staff to the punch.

¹³ While NFS surrendered the low-level radioactive waste burial ground to NYSERDA pursuant to their Settlement Agreement, it is not clear from those materials before this Board who, if anyone, is to be in possession and control of that area of the West Valley site during DOE's conduct of the demonstration project.

Although the matter is not squarely before us, since these license amendments relate only to high-level waste and ancillary facilities, the NRC Staff should ensure that the various transfers have not neglected the need that a qualified licensee be in possession and control of the low-level waste site and that appropriate license conditions be implemented with respect to that site, so as to reasonably assure the health and safety of the public.

The Commission may wish to obtain a status report from the Staff with respect to this matter. The Board respectfully suggests that the Commission do so.

effect of the issuance of Change No. 32 upon this proceeding, in addition to their responses to this Board's December 31, 1981 order. Among other matters, we specifically requested that the Staff and any other participant wishing to state its views explain why and to what extent Change No. 32 "is not an issue before this Board," noting that it "accords the very relief sought by NFS in this proceeding," and citing 10 CFR §2.717(b) (1981).

Pursuant to Section 2.717(b), the Director of Nuclear Reactor Regulation or the Director of Nuclear Material Safety and Safeguards, as appropriate, is specifically empowered to issue orders or to take any otherwise proper administrative action with respect to a licensee who is a party to a pending proceeding. The section specifically grants the presiding officer of a pending proceeding the power to modify, as appropriate for purposes of the proceeding, any order related to the proceeding's subject matter.¹⁴

The Staff, in its March 8, 1982 filing, asserts that Change No. 32 is unrelated to the subject matter presented by NFS's hearing request. In its view, the issuance of Change No. 32 does not, "by itself," grant NFS the relief which it sought, resolve the factual or legal issues which NFS had sought to litigate with respect to Change No. 31, or deprive NFS of standing to seek a resolution before the Board of the issues raised in its request for hearing. It is unclear what meaning, if any, the Staff attached to the words "by itself."

In support of its argument, the Staff asserts that the circumstances of the transfer of the West Valley facility under Change No. 31 were not modified by the issuance of Change No. 32, hence, ". . . if NFS had decided to pursue its claims, and if the arguments of NFS were found to be meritorious, it would still be entitled to relief, notwithstanding issuance of Change No. 32."

¹⁴ In *Cincinnati Gas and Electric Co. (William H. Zimmer Nuclear Station)*, LBP-79-24, 10 NRC 226, 229-230 (1979), a licensing board analyzed those situations when a board might modify an order or action of the Staff:

. . . On the one extreme, an activity may be so closely related to the subject matter of a proceeding, as in the *Diablo Canyon* proceeding [*Pacific Gas and Electric Company* (Diablo Canyon Nuclear Power Plant, Units 1 and 2, CLI-76-1, 3 NRC 73, 74, n. 1 (1976) (consideration of materials license authorizing delivery and storage of fuel assemblies held to be "integral" to licensing board's consideration of operating license)], that any Staff order may normally not be issued (or, if issued, must be stayed pending resolution to [sic] the contested issue). At the other extreme, a particular subject may be so far removed from a pending proceeding that its consideration is inappropriate — such as the antitrust issues sought to be raised in the *Marble Hill* safety and environmental proceeding [*Public Service Co. of Indiana, Inc.* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-316, 3 NRC 167 (1967)]. Finally, there are matters with respect to which independent Staff action is entirely appropriate but which bear enough relationship to the subject matter of a pending proceeding that review by the Licensing Board in that proceeding is appropriate (Emphasis in original.)

We disagree. The Staff's conclusion that the issues which NFS had sought to litigate were neither modified nor resolved by the issuance of Change No. 32 is incorrect.¹⁵ It is clear that the issuance of that license amendment effectively removed NFS's "standing" to assert its claims by granting it the relief sought in this proceeding.

In determining hearing and intervention rights under Section 189(a) of the Atomic Energy Act of 1954, 42 USC §2239, the Commission will apply judicial concepts of standing. *Public Service Company of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), CLI-80-10, 11 NRC 438, 439 (1980). To have "standing" in a court, one must allege first an interest arguably within the zone of interests protected by the statute and second, an injury that has occurred or arguably would result from the action complained of. "Under this 'injury in fact' test, a mere academic interest in a matter, without any real impact on the person asserting it, will not confer standing," *Portland General Electric Company* (Pebble Springs Nuclear Plant, Units 1 and 2), CLI-76-27, 4 NRC 610, 613 (1976).

In this proceeding, the "injury in fact" asserted by NFS in its October 13, 1981 Request for Hearing is that Change No. 31 terminated its rights without terminating its responsibilities and thereby threatened its legal and economic interests. As NFS questioned the validity and effect of the license amendment under various Federal laws and NRC regulations, it sought a clarification of its rights and responsibilities from this Board. The effect of Change No. 32, however, was to terminate NFS's responsibility under Provisional Operating License No. CSF-1, upon the happening of certain conditions, including its signing of the Settlement Agreement with NYSERDA.

In our opinion, any need for us to consider NFS's claim that its responsibilities under its license should have been terminated after Change No. 31 was rendered moot by the termination of NFS's interests in the license by Change No. 32.

This also seems to be the conclusion of NFS, although stated by it, for reasons unclear to the Board, as an argument that Change No. 32 does *not* relate to the subject matter of this proceeding. At page 9 of its March 8, 1982 filing, NFS states that "(t)he potential issues before this Licensing Board relate only to the appropriateness of Change No. 31" NFS

¹⁵ For example, the Staff asserts, at page 6 of its March 8, 1982 submission, that Change No. 32 "(d)oes not modify the continuing licensee obligation during the period when the facility is in the possession of DOE." While this statement appears true for NYSERDA, we believe that Change No. 32 plainly altered the licensee obligation of NFS during DOE's possession of the West Valley facility, as it terminated all of NFS's rights and responsibilities under the facility's license upon the happening of certain conditions.

goes on to state, however, that its concerns regarding potential legal and economic consequences "now have been alleviated" and that "(s)ince the transfer has already occurred, . . . NFS's objections are now moot." Similarly, as we observed above at n. 12, NFS's withdrawal of its hearing request itself stated that Change No. 32 "removed NFS's objections to Change No. 31."

In arguing that Change No. 32 does not accord NFS the very relief which it sought in this proceeding, the Staff acknowledges, at page 11 of its March 8, 1982 submission, that NFS had indicated in its October 13, 1981 letter to the Commission that it would withdraw its request for hearing if its October 6, 1981 application for a license amendment terminating the responsibility of NFS under its NRC license were granted. The Staff concludes, however, that this amendment was not the relief requested in this hearing, but a collateral matter addressed to the NRC Staff. It further concludes that the denial of this NFS application for a license amendment by the Staff on January 11, 1982 was dispositive of the matter in any event.

In this Board's opinion, however, it is clear that NFS saw both this adjudicatory hearing and the Staff's administrative license amendment process as merely two paths leading to the same objective *i.e.*, termination of its responsibilities under its NRC license.

We read NFS's statement that it would withdraw its October 13, 1981 request for hearing if its October 6, 1981 license amendment application were granted as just one indication of NFS's intent to terminate its license responsibilities by any available legal course of action. For example, even after the Staff denied NFS's October 6, 1981 license amendment application on January 11, 1982, NFS appended this proposed license amendment to its January 22, 1982 response to our December 31, 1981 order, proposing, at 6, to have this Board consider the terms of this amendment "as a means of correcting the deficiencies and problems inherent with the September 30th amendment [Change No. 31]." As the terms of the license amendment granted by Staff on February 12, 1981 effectively grant NFS the same release from its rights and responsibilities under its NRC license as it had sought from this Board, we conclude that Change No. 32 is addressed to the same subject matter as this proceeding; and that it would thus be within our power, pursuant to 10 CFR §2.717(b), to modify that license amendment as we deem appropriate for purposes of this proceeding.

We do not deem such a modification to be necessary or appropriate in this proceeding, however. The differences between NFS and NYSERDA, which apparently existed long before the issuance of Change No. 31 and which apparently prompted NFS to originally oppose this license amend-

ment, seem to have been resolved pursuant to the Settlement Agreement signed by these parties on February 18, 1982.

Additionally, the Commission's November 6, 1981 decision in this case held that prior hearing is not required before DOE takes possession of the facility. Therefore, even though Change No. 32 does affect the subject matter of the NFS request, it does not affect any rights of Dr. Bross. He would not be entitled to a hearing prior to the effectiveness of Change No. 31, even if he had requested such a prior hearing. (He did not.)

Furthermore, in light of our ruling, *infra*, below that the West Valley Act and other statutes preclude an NRC licensing board from adjudicating the conduct of DOE of the demonstration project, we conclude we are precluded from hearing Dr. Bross' claims under either Change No. 31 or 32.

Dr. Bross, in his letter to the Board of February 16, 1982, states that he requests a hearing on Change No. 32 because it clears the way for DOE to take possession of the facility to conduct that demonstration project. Dr. Bross reiterates in summary from his claims in connection with Change No. 31 that DOE's conduct of the project will cause hazards. Thus, the matter which Dr. Bross seeks to litigate would be the same under either Change No. 31 or 32. If we had found below that an NRC licensing board has jurisdiction to adjudicate Dr. Bross' claims regarding DOE's conduct, then we believe the Board would have been able to consider the effect of Change No. 32, if any, on Dr. Bross' claims pursuant to 10 CFR §2.717(b), based on our discussion above. Where Section 2.717(b) applies, there is no need for the Commission's Order and Notice of Hearing, which refers only to Change No. 31, to be explicitly expanded to refer to the subsequent Change No. 32 as a prerequisite to jurisdiction to consider that subsequent license amendment. *See Diablo Canyon, supra*, 3 NRC at 74, n. 1. Otherwise, the authority conferred by Section 2.717(b) would be severely limited and could be easily avoided by the form in which an amendment to a license is cast.

Hearing Request of NFS

On February 11, 1982, NFS filed a "Withdrawal of Request for Hearing" which, on its face, appeared to be addressed to the Commission.

In response to a question we posed in our February 19, 1982 order, NFS, in its March 8, 1982 filing, clarified that its Withdrawal was intended to be addressed to this Board.

We deem this Withdrawal, as clarified, to be a motion to dismiss this proceeding, insofar as it relates to those issues presented by the NFS request for hearing, and this motion is hereby granted.

Hearing Request of Dr. Irwin D. J. Bross

We turn our attention now to the hearing request of Dr. Bross, and the question of whether it is within this Board's jurisdiction under the November 6, 1981 order of the Commission and the West Valley Act to consider the public health and safety matters upon which he has requested a hearing and/or to grant the relief which he has requested.¹⁶

At the outset, we note that while the Commission's November 6, 1981 Order specifically delegated the authority for a licensing board to "conduct an adjudicatory hearing" with respect to NFS's Request for Hearing, it empowered this Board only to "review" Dr. Bross' Request for Hearing.¹⁷ The Staff asserts in its March 8, 1981 Answer to our December 31, 1981 and February 19, 1982 orders (Staff's March 8, 1981 Answer), at 15, that this distinction should be read as limiting our jurisdiction to making a determination of whether a hearing should be granted with respect to Dr. Bross' request, while precluding us from holding such a hearing even if we were to deem it necessary. While we believe that the Commission's intent in using this language is not altogether clear, we conclude that the Staff's interpretation of this language is possibly correct. Had this Board determined a hearing to be necessary pursuant to Dr. Bross' request, we might have sought confirmation of our authority to conduct it.

In the view of the Staff, however, those issues which Dr. Bross seeks to litigate in this proceeding are specifically removed from consideration by the Commission by virtue of the provisions of the West Valley Act, and are, hence, beyond the subject matter jurisdiction of this Board. In support of this conclusion, the Staff's November 27, 1981 Response to Request of Dr. Irwin D. J. Bross for Hearing, at 4-6, relies on several sections of the West Valley Act, particularly Section 2(c), and portions of that statute's legislative history which were asserted to demonstrate that there was "no doubt" that Congress did not intend that DOE's activities be subject to formal NRC licensing or regulation.

In our February 19, 1981 memorandum and order, at 4, n. 5, we observed that the attachment describing the Act's legislative history which the Staff had appended to its November 27, 1981 filing contained references to legislative history which appeared to be contrary to the Staff's position. We further noted that the identical attachment which the Staff provided to this Board had been submitted as part of an informational memorandum to the Commissioners by the NRC Office of General Coun-

¹⁶ Dr. Bross' Request for Hearing on Change No. 31 is addressed to issues other than those raised by NFS. As such, it is an independent request for a hearing, not a petition to intervene in the hearing granted to NFS.

¹⁷ 14 NRC at 943. See text accompanying n. 8, *supra*.

sel.¹⁸ This memorandum, which we appended to our February 19, 1982 order for use by the participants, concluded that it was "uncertain" whether Congress had intended that DOE be an NRC licensee.¹⁹ Both our footnote and the accompanying text stated that the Board had not yet determined the permissible scope of its inquiry into DOE's conduct of the West Valley Demonstration Project, but was instead awaiting the pending submissions of the participants. No subsequent submission of any party attempted to explain the apparent inconsistencies in the Act's legislative history.²⁰ The Board therefore deems that allowing the participants a further opportunity to brief this point is unwarranted.²¹

NRC Jurisdiction Over DOE Under The West Valley Act

Congress itself has long struggled with the question of whether DOE should become an NRC licensee for purposes of the West Valley Demonstration Project prior to the enactment of the West Valley Act. A bill comparable to the West Valley Act had in fact passed both houses of Congress the year before this statute was enacted, but was never reported out of the conference committee due to what one Senator described as "jurisdictional uncertainties."²² Furthermore, an earlier version of the bill which eventually evolved into the West Valley Act had required that DOE and NYSERDA submit jointly an application for a license amendment, "if necessary,"²³ apparently evincing an attempt to leave to the NRC the question of whether, under existing law, DOE was required to become an NRC licensee. This provision was never approved by either house of Congress, however.

¹⁸ SECY-81-24 (January 13, 1981).

¹⁹ *Id.*, at 4.

²⁰ The Staff's March 8, 1982 filing did not address the Commission's jurisdiction over DOE activities, other than to recite sections of the West Valley Act and to state that the basis for its position on the Commission's lack of jurisdiction is explained in its November 27, 1981 response to Dr. Bross' request for hearing.

NYSERDA states, in its February 16, 1982 answer to our December 31, 1981 order, that it concurs in the views expressed in Staff's November 27, 1981 pleading, but provides us with little analysis in support of that conclusion in either that answer or its March 8, 1982 filing.

²¹ NYSERDA's February 16, 1982 answer, at 9-10, and Staff's March 8, 1981 pleading, at 18, each request three weeks to respond to any further opportunity given to Dr. Bross to brief this matter. We conclude that the parties have already been given sufficient opportunity to address this issue.

²² See discussion of Senator Javits at 126 Cong. Rec. S6732 (June 12, 1980).

²³ See H.R. Rep. No. 96-1100 (I), 96th Cong., 2d Sess. 9 (June 18, 1980), reprinted in [1980] U.S. Code Cong. & Ad. News 6017, 6022.

As initially passed by the Senate on June 12, 1980, the West Valley Act contained language identical to that finally enacted as Section 2(b)(4)(D) which provides for:

(D) Submission jointly by the Department of Energy and the State of New York of an application for a licensing amendment as soon as possible with the Nuclear Regulatory Commission providing for the demonstration.

As reported by the House Committee on Interstate and Foreign Commerce on September 15, 1980, however, this language had been deleted in favor of a provision which became Section 2(b)(4)(B) of the Act:

(B) The Secretary shall provide technical assistance in securing required license amendments.

The House passed this bill on the same day it was reported out of Committee, and then proposed an amendment to the Senate bill which substituted the language of the House-passed bill for that which the Senate had earlier approved.²⁴

On September 17, 1980, the Senate approved the substitution of the text of the House bill for that of its own bill, but made two additions to the House text: First, the requirement now contained in Section 2(b)(4)(D) that DOE join NYSERDA in applying for an NRC license amendment, which the House had rejected, was reinserted; second, a proviso was added to Section 2(c) of the Act requiring that NRC review and consultation with regards to the demonstration project be conducted "informally" and not include or require formal procedures or actions by the Commission pursuant to the Atomic Energy Act of 1954, as amended, 42 U.S.C. §§2011, *et seq.*, or the Energy Reorganization Act of 1974, as amended, 42 U.S.C. §§5801, *et seq.*

As passed by the Senate, Section 2(c) provided, in pertinent part:

(c) Within one year from the date of the enactment of this Act, the Secretary shall enter into an agreement with the Commission to establish arrangements for review and consultation by the Commission with respect to the project: Provided, That review and consultation by the Commission pursuant to this subsection shall be conducted informally by the Commission and shall not include nor require formal procedures or actions by the Commission pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, or any other law

.....

The House passed this bill, as amended by the Senate, later that same day.

²⁴ 126 Cong. Rec. H8771 (September 15, 1980).

In support of its conclusion that DOE's conduct of the West Valley Demonstration Project is not a proper subject before this Board, the Staff's November 27, 1981 filing quotes from portions of the Congressional Record of September 15, 1980 in which Congressmen McCormack and Lundine conclude that the bill which they were debating on the floor on that date was not intended to make DOE an NRC licensee. The Staff also relies on that portion of Section 2(c) of the West Valley Act which mandates that review and consultation by the Commission be conducted "informally".

We note initially that the comments of Congressmen McCormack and Lundine quoted by Staff were made on September 15, 1981, prior to the Senate's reinsertion of the above-quoted language of Section 2(b)(4)(D) requiring that DOE and New York State submit "jointly" an application for an NRC license amendment. The September 15, 1980 report of the House Committee on Interstate and Foreign Commerce had specifically rejected this Senate-passed language, substituting the requirement that DOE provide New York State with "technical assistance" in applying for this license amendment. The Committee stated that it had made this change so as to avoid potential "legal consequences" extending beyond the scope of the program which it feared might be raised if DOE were required to become a co-applicant for the license amendment (which the Committee had believed to be required by the language which is now Section 2(b)(4)(D)).²⁵ The statements of these two Congressmen therefore do not necessarily reflect the proper interpretation of the provisions of the West Valley Act as finally enacted.

We further note that both of the comments quoted by the Staff were drawn from the statements of these Congressmen after they had been given permission to revise and extend their remarks.²⁶ Therefore, these quotations do not necessarily reflect what was said on the House floor on that date, or the intent of Congress.

However, even though the subsequent reinsertion and final enactment of Section 2(b)(4)(D) undercuts the remarks of Congressmen Lundine and McCormack, the contemporaneous addition and final enactment of the apparently inconsistent proviso to Section 2(c) providing for informal review and consultation supports the view that Congress did not intend DOE to be an NRC licensee, at least not in the traditional sense of being subject to formal procedures such as hearings. There is language in the

²⁵ H.R. Rep. No. 96-1100 (II), 96th Cong. 2d. Sess. 16-17 (September 15, 1980), *reprinted in* [1980] U.S. Code Cong. & Ad News 6028, 6041-6042. (Hereinafter, "September 15, 1980 House Committee Report.")

²⁶ 126 Cong. Rec. H8765 and H8766 (September 15, 1980).

September 15, 1980 House Committee Report to the effect that the version of Section 2(c) before the Senate proviso was added was intended "to establish a mechanism for communication and not define the legal scope of the relationship" between DOE and NRC.²⁷ We do not believe that interpretation of Section 2(c) to be controlling as to the Senate's intent in its subsequent addition to Section 2(c) of the above-quoted proviso precluding formal procedures or actions by the Commission pursuant to the Atomic Energy Act or the Energy Reorganization Act.

Nor does the Congressional Record clarify the Senate's intentions. The summary of the legislative history of the West Valley Act which was annexed as an attachment to Staff's November 27, 1981 filing attempts to reconcile the Senate's September 17, 1980 adoption of both Section 2(b)(4)(D) and the proviso to Section 2(c) by reciting that Senator Jackson stated on the Senate floor that the requirement that the Secretary of DOE join New York in applying for a license amendment was intended to ensure protection of the Federal Government's interest as a supplier of 90 percent of the project's costs. It concludes from this statement that the Senate's reinstatement of this provision, when viewed with the Senate's characterization of the review and consultation procedures as informal, was not intended to make DOE an NRC licensee, but merely to protect the financial interests of the Federal Government.

The Board does not believe the Senate's purposes in its September 17, 1980 amendments to the House bill to be so clear. We observe that the sentence of Senator Jackson immediately preceding that which was noted refers to DOE as being "party" to the license amendment to be sought by New York State and specifically states that the provision being inserted is drawn from the earlier Senate-passed version of the bill.²⁸ In our view, Senator Jackson's statement that this provision was being reinstated so as to protect the Federal Government's financial interest in the West Valley Project can also be read as supporting an interpretation that Section 2(b)(4)(D) requires that DOE become an NRC licensee; requiring that DOE become a co-licensee with NYSERDA would seem to afford the

²⁷ September 15, 1980 House Committee Report at 22-23, *reprinted in* [1980] U.S. Code Cong. & Ad News at 6047.

²⁸ "... The Senate-passed version of S.2443 contained, under the provision for a cooperative agreement with the State of New York, a requirement that the Department of Energy be party to the licensing amendment which will be required in order to conduct the project. I believe that reinserting this provision will insure that the interests of the Federal Government, which will bear 90 percent of the project, will be protected" 126 Cong. Rec. H12762 (September 17, 1980).

Federal Government at least as much protection of its financial investment as it would the Staff's interpretation of this provision.²⁹

The congressional statement which came closest to reconciling the apparent inconsistencies in the provisions of the West Valley Act occurred during the debates on the floor of the House after the final Senate-passed version of the bill was returned for House approval. In a discussion of the Senate-passed amendment to subsection 2(c), Congressman Ottinger states his understanding of this amendment as meaning that "... formal procedures such as licensing procedures ..." will not be required "... but it does not preclude the Commission from taking any action that otherwise would be authorized by law."³⁰ No Congressperson challenged Mr. Ottinger's understanding of these amendments as meaning that DOE should not be subjected to formal licensing procedures.³¹

In this Board's opinion, Congressman Ottinger's interpretation of Section 2(c) is the only way in which this section can be read consistently with the other provisions of the West Valley Act. We therefore need not resolve whether Congress intended DOE to be an NRC licensee; whether or not Congress intended DOE to be nominally an NRC licensee, its relationship with NRC during the conduct of the West Valley Demonstration Project is to be conducted informally, including any licensing proceedings under the Atomic Energy Act or the Energy Reorganization Act.³² We

²⁹ The House's comments on the Senate's addition of Section 2(b)(4)(D) do not clarify how this provision was intended to be reconciled with the proviso added to Section 2(c). On the floor of the House, Congressman Lundine explained, in response to a question from Congressman Lujan, that the Senate-passed amendment to the bill requiring that DOE join NYSERDA in seeking a license amendment was intended to ensure DOE's agreement to the amendment, rather than allowing New York State to seek such an amendment alone. 126 Cong. Rec. H9052 (September 17, 1980).

In this Board's view, this statement is consistent with Senator Jackson's earlier remark that the provision was added to protect the Federal Government's financial investment in the demonstration project. Similarly, we conclude it is not dispositive as to whether Congress intended DOE to be an NRC licensee. We note, however, that on the House floor, Congressman Lundine identified the language of this provision to be identical to that which the Subcommittee on Energy and Power of the House Committee on Interstate and Foreign Commerce had previously eliminated from the bill, having concluded that it would require that DOE become an NRC licensee. See n. 25, *supra*, and accompanying text.

³⁰ 126 Cong. Rec. H9053 (September 17, 1980).

³¹ Congressman Dingell, in his extended remarks, concluded that the House's adoption of the Senate amendments makes DOE an NRC licensee. *Id.* The weight which should be given to these extended remarks not necessarily made in the course of on-the-floor debate is unclear.

³² What other NRC actions might be "otherwise authorized by law" during DOE's conduct of the demonstration project are not clear to this Board.

While Section 5(a) of the West Valley Act states that "... Nothing in this Act shall be construed as affecting any applicable licensing requirement of the Atomic Energy Act of

(CONTINUED)

therefore conclude that the West Valley Act, particularly the clear language of Section 2(c), the meaning of which is not controverted by the legislative history analyzed above, precludes a formal hearing with respect to DOE's conduct of the project itself.³³ Because we conclude that this Board lacks subject matter jurisdiction over this matter, we rule that Dr. Bross' hearing request must be denied.

It is therefore

ORDERED that the request of NFS to withdraw its October 13, 1981 request for hearing is granted; and it is

ORDERED that Dr. Irwin D. J. Bross' October 16, 1981 request for hearing on Change No. 31 is hereby denied. In the light of our ruling above that Change No. 32 is addressed to the same subject matter as Change No. 31, Dr. Bross' February 16, 1982 request for hearing on Change No. 32 is also denied.

Pursuant to 10 CFR §2.714a, Dr. Bross is advised that this order wholly denying his request for a hearing may be appealed on the question of whether his hearing request should have been granted in whole or in part by the filing (placing in the first class mail) of a Notice of Appeal and Supporting Brief with the Atomic Safety and Licensing Appeal Board

1954 or the Energy Reorganization Act of 1974 . . .", Section 202 of the Energy Reorganization Act, 42 U.S.C. §5842, specifically limits NRC jurisdiction over DOE-operated high-level radioactive waste storage facilities to those which will be operated on a "long-term" basis.

The legislative history of that Act defines "long-term" as meaning "tens to of hundreds of years," and specifically excluded short-term research and development activities. S. Rep. No. 93-707, 93d Cong., 1st Sess. (December 7, 1973), *reprinted in* [1974] U.S. Code Cong. & Ad. News at 5521. While the West Valley Project is to last "at least 15 years" [H.R. No. 97-273, 97th Cong., 1st Sess. at 18 (October 15, 1981)], it is not a "long-term storage facility" within the meaning of that Act.

³³ We concur with Staff's position in its March 8, 1982 filing at 17, however, that pursuant to Section 2(a)(5) of the West Valley Act, DOE's conduct of the subsequent decontamination and decommissioning of the West Valley facility may be subject to full NRC regulation and licensing requirements.

within ten days after service of this order (with the allowance of five additional days for time taken by mailing of the order).

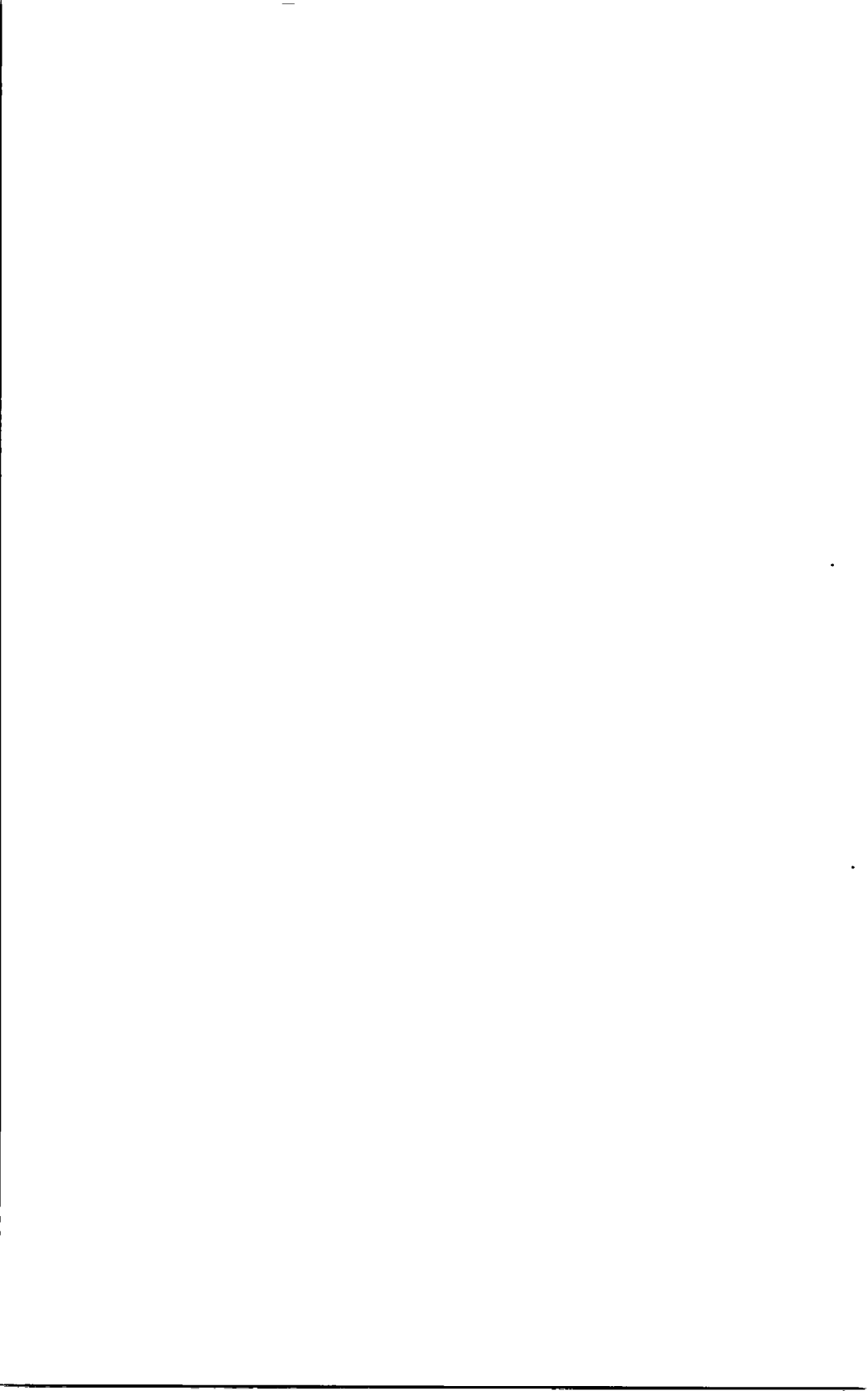
**THE ATOMIC SAFETY AND
LICENSING BOARD**

**Lawrence Brenner, Chairman
ADMINISTRATIVE JUDGE**

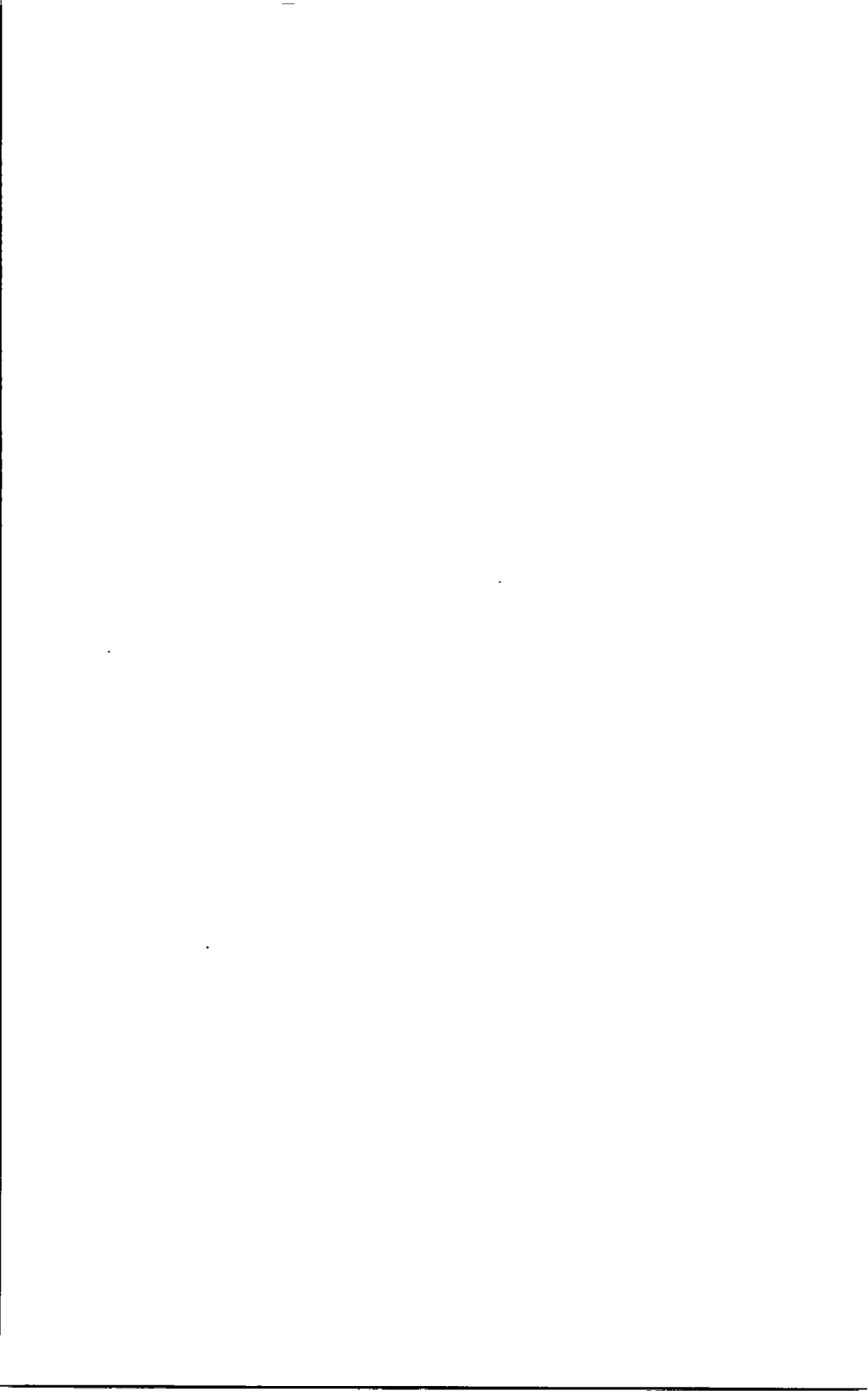
**Dr. Jerry Harbour, Member
ADMINISTRATIVE JUDGE**

**Dr. Peter A. Morris, Member
ADMINISTRATIVE JUDGE**

**Dated this 30th day of April, 1982
Bethesda, Maryland.**



The declination of review of ALAB-644 by the Commission, March 18, 1982 was not assigned a CLI number until July 1982. Therefore, this declination of review can be found at CLI-82-12A, 16 NRC 7 (1982).



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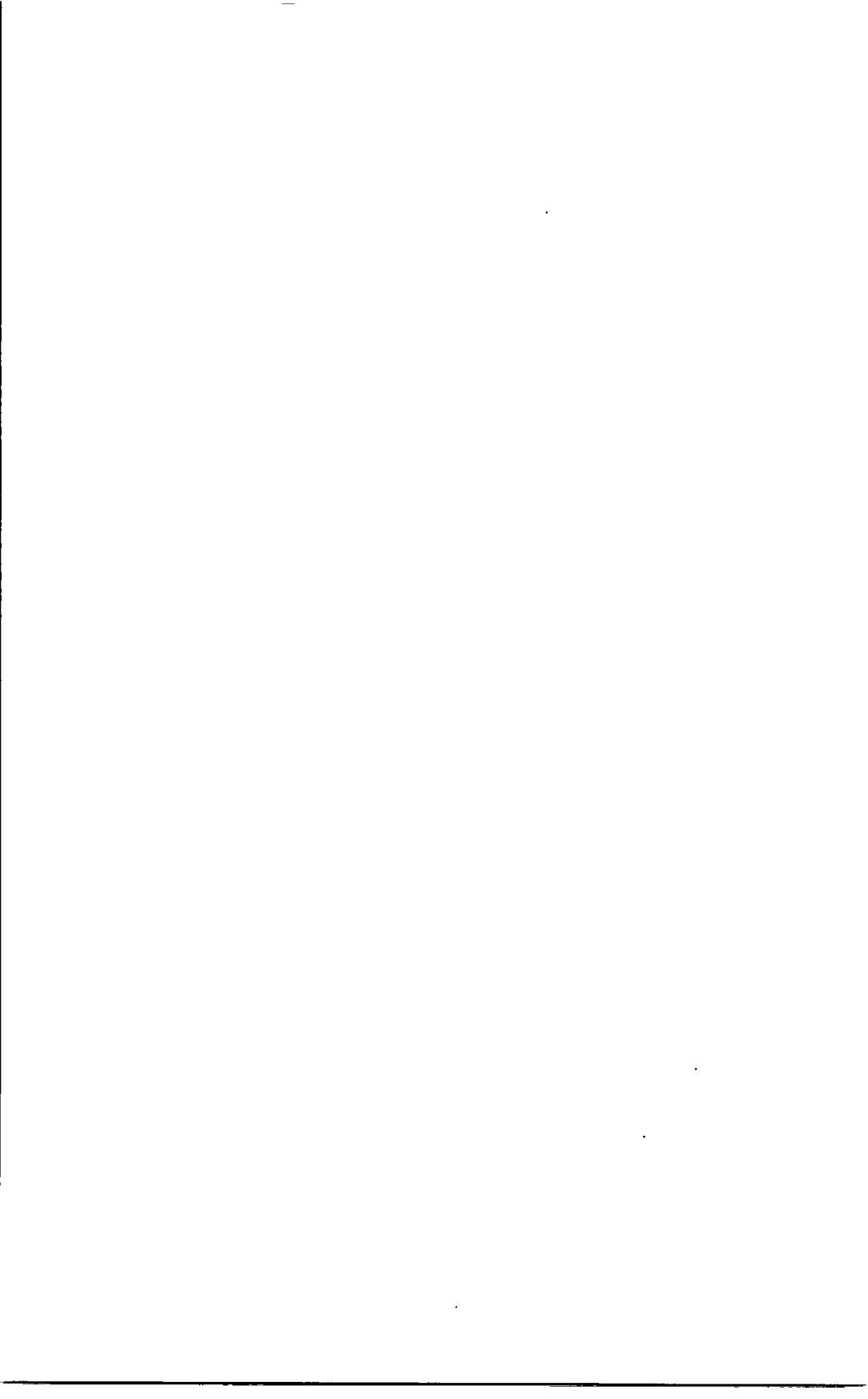
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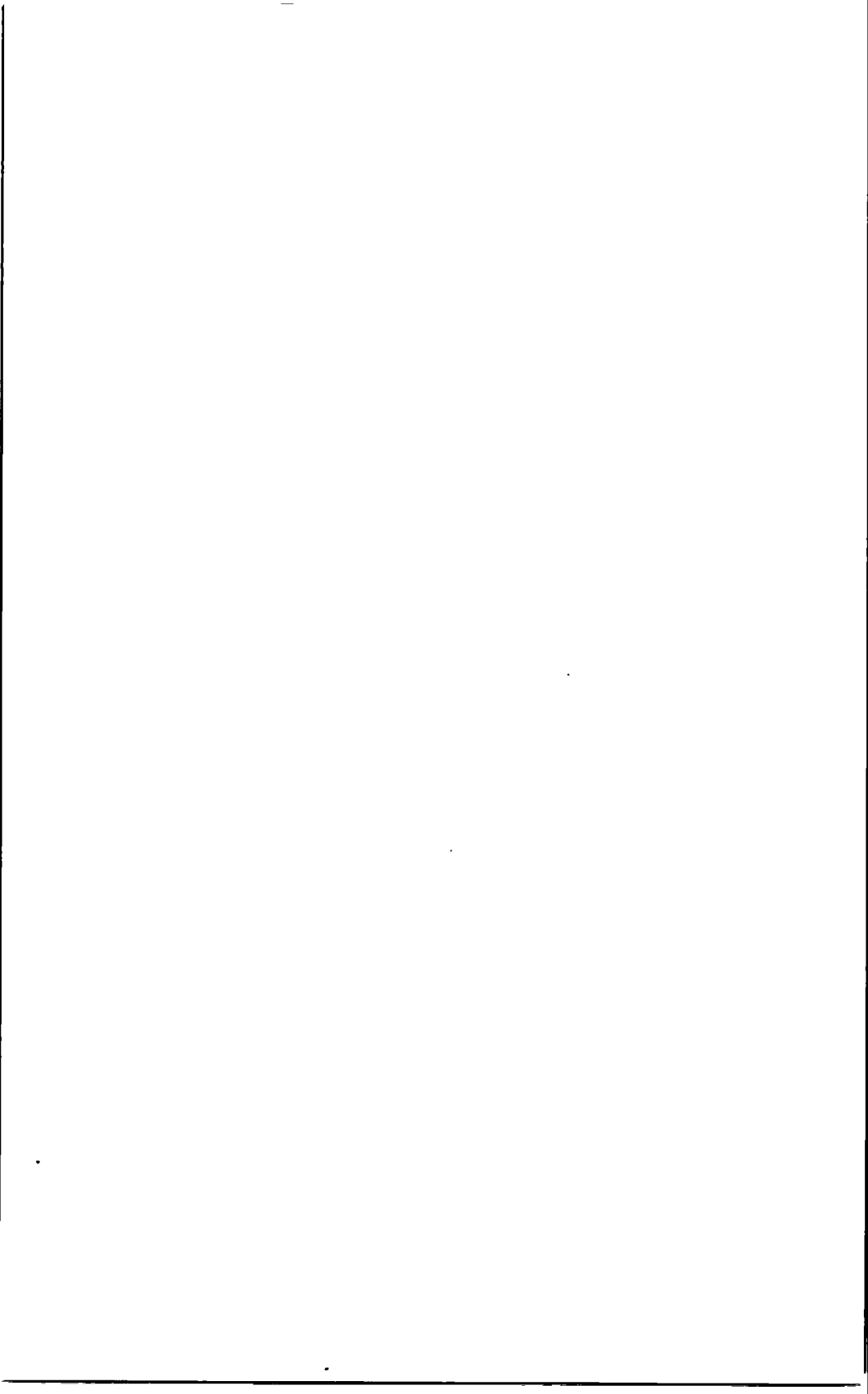
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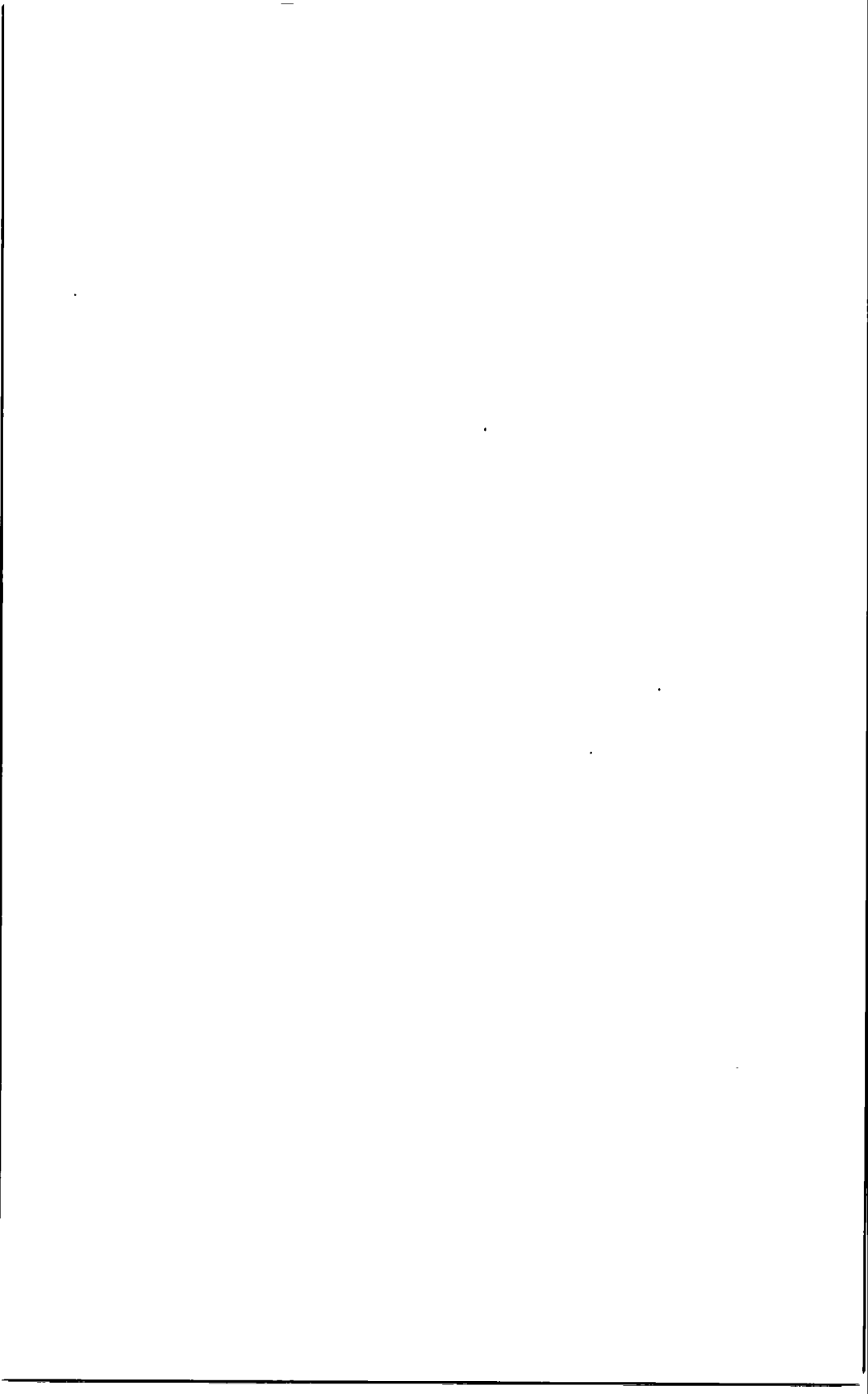
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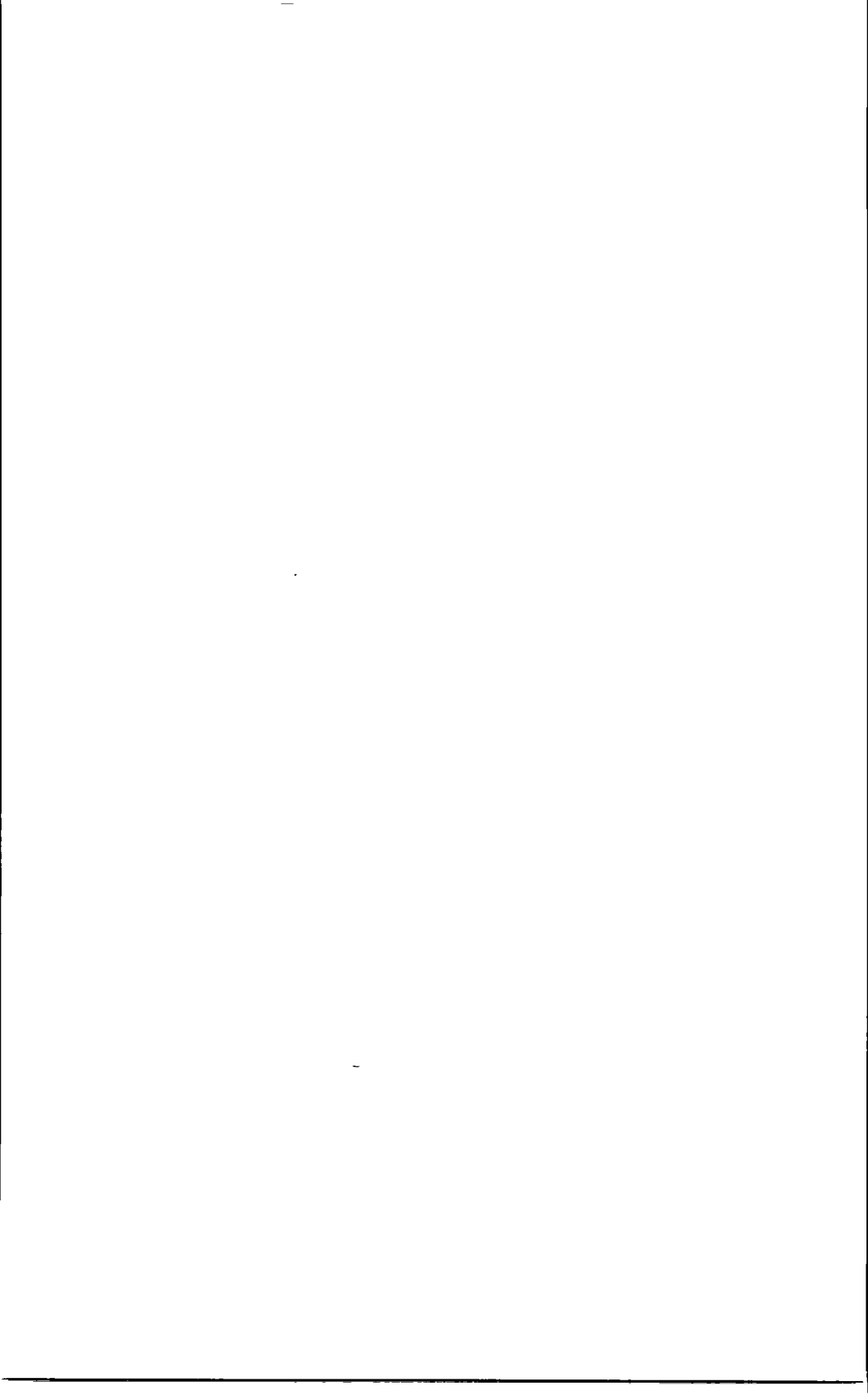
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