



May 19, 1983 **ADJUDICATORY ISSUE** SECY-83-189
 (Notation Vote) COMMISSION LEVEL
DISTRIBUTION ONLY

For: Commissioners

From: Herzel H.E. Plaine
 General Counsel

Subject: REVIEW OF ALAB - 717 (SOUTHERN CALIFORNIA EDISON CO. et. al.)

Facility: San Onofre, Units 2 and 3

Petitions for Review: Two: (1) intervenors Carstens, et. al. regarding seismic design issues and alleged procedural errors; and (2) intervenors GUARD, et. al. regarding emergency planning issues.

Review Time Expires: June 7, 1983 (as extended)

Purpose: To inform the Commission of the subject Appeal Board decision, to analyze the petitions for review [and to recommend that, in our opinion,

Discussion: In ALAB-717 the Appeal Board affirmed, subject to licensing conditions, the Licensing Board's authorization of the issuance of full power operating licenses for the San Onofre Nuclear Generating Station, Units 2 and 3. The license conditions give the applicant four months to: (1) prepare a list of housebound people who would require transportation from the plume emergency planning zone; and (2) develop and initiate a program to train County bus

EVE

CONTACT:
 Sheldon L. Trubatch, OGC
 634-3224
 Richard L. Black, OGC
 634-1465

Information in this record was deleted in accordance with the Freedom of Information Act, exemptions 5
 FOIA- 92-436

drivers how to respond to a radiological emergency. In denying the intervenors' appeals of the Licensing Board's resolution of certain seismic and emergency planning issues, the Appeal Board relied in substantial part on its previous denials of stay requests by the intervenors. Those previous Appeal Board decisions were discussed in SECY-80-230 and SECY-82-364 and need not be reanalyzed extensively here. Accordingly, this paper concentrates on the Appeal Board's resolution of the new issues which intervenors have raised in their petitions for review. The Applicants and the NRC staff opposed review. Seismic and procedural issues are addressed first, followed by those on emergency planning.

I. Seismic Issues

A. Appeal Board Decision

The principal seismic design issues raised by the intervenors on appeal were:

1. Whether the Licensing Board erred in finding that the Cristianitos Fault, which passes about one-half mile from the plant, is not a capable fault;
2. Whether the Licensing Board erred in estimating the maximum earthquake that could be caused by the Offshore Zone of Deformation (OZD), the geologic feature which controls San Onofre's seismic design; and
3. Whether the Licensing Board erred in finding that there was an adequate investigation of other geologic features closer to San Onofre than the OZD, principally the Cristianitos Zone of Deformation (CZD), which is completely unrelated to the Cristianitos Fault.

The Appeal Board decided these issues as follows:

1. Cristianitos Fault

The Licensing Board erred in relying on res judicata or collateral estoppel to foreclose the intervenors from fully litigating the capability of this fault at the operating license ("OL") stage when they had not litigated the issue at the construction permit ("CP") hearing. While such foreclosure may be a reasonable procedural requirement under section 189a, of the Atomic Energy Act of 1954, as amended ("Atomic Energy Act"), it would be unfair to apply that requirement prospectively to a party who had no previous notice of it.

The Appeal Board found that, in any event, the error was not prejudicial to the intervenors. The only effect of foreclosure was to preclude intervenors from cross-examining NRC staff witnesses on pre-1973 information bearing on the capability of the fault.¹ In spite of several opportunities, intervenors have never offered to show what they expected to prove on such cross-examination. As for intervenors' direct testimony, which had been stricken by the Licensing Board, it was, nevertheless, considered by the Appeal Board.

Intervenors also relied on two post-1973 earthquakes as demonstrating the capability of the Cristianitos Fault. Experts for the applicants and staff testified that these earthquakes were neither consistent with the orientation of the Cristianitos Fault nor with the type of motion it can undergo. Accordingly, the Appeal Board rejected the intervenors' evidence as not probative.

¹In CLI-82-11, 15 NRC 1383, 1384 (1982) the Commission determined that under these circumstances the curtailment of the right of cross-examination was not per se prejudicial error.

2. Offshore Zone of Deformation

Intervenors repeated their claim that the Licensing Board erred by treating the OZD as segmented, contrary to the understanding of the parties. The Appeal Board rejected this claim on the basis of its analysis in the earlier denial of a stay. ALAB-673, 15 NRC at 702-709. Intervenors also contended that the Licensing Board erred in relying on the method (the slip-rate method) used by the applicants' expert for determining the maximum earthquake that could be generated on the OZD. The Appeal Board reviewed each technical challenge to the slip-rate method and dismissed each challenge on the basis of contrary evidence in the review. Moreover, the Appeal Board found that the Licensing Board had relied on several other analytic techniques to determine the maximum earthquake on the OZD, and that all these techniques led to similar results. Accordingly, the Appeal Board concluded that the seismic design of San Onofre is adequately conservative.

3. Other Geologic Features

Intervenors contended that the Cristianitos Zone of Deformation (CZD), which is closer to San Onofre than the currently controlling OZD, is a branch of the OZD which could move as a result of movement on the OZD and which either runs under San Onofre or connects to onshore features that are capable of causing the ground to rupture. Although the applicants disputed any connection between the OZD and CZD, the difficulty in interpreting the seismic data in the region of claimed connection precluded any expert witness from definitively resolving the issue. However, the Appeal Board found irrelevant this indeterminacy because the asserted point of connection is overlaid by unfaulted strata several million years old and implies that the CZD may be disregarded as a source of earthquake activity. As for connections between the CZD and

onshore features, the Appeal Board found that the weight of the evidence showed that the CZD did not reach the shoreline.

Procedural Objection

Intervenors also renewed their challenge to the Licensing Board's admission of the applicants' Final Safety Analysis Report (FSAR) without authentication or an opportunity to cross-examine the authors of contested sections. The Appeal Board found that the applicant had provided a witness whose testimony sufficed to support the finding that the FSAR was what its proponents claimed it to be.

However, the Appeal Board differed with the Licensing Board on the need for sponsors who could be cross-examined on challenged sections of the FSAR.

In the Appeal Board's view, the FSAR did not need a sponsor to be conditionally admitted into evidence for the truth of its contents. This is because hearsay is admissible in NRC proceedings. However, once portions of the FSAR are contested, then the contestant must have an opportunity to cross-examine witnesses competent to testify on the opinions and conclusions in controversy.

In the Appeal Board's view, the applicants' failure to provide such witnesses would divest the contested portions of the FSAR of the indicia of reliability necessary for admissibility into evidence. The Appeal Board noted that this ruling was consistent with the NRC's treatment of reports by the Advisory Committee on Reactor Safeguards (ACRS) and with judicial decisions. However, the Appeal Board found that admission of the entire FSAR without sponsors was harmless error because the Licensing Board relied on the FSAR for only two, non-critical seismic findings.

B. Intervenors' Petition and OGC Analysis

Intervenors petitioned for review on four issues: (1) institutional bias; (2) denial of due process and a fair hearing; (3) inconsistent use of the term conservative; and (4) failure to properly credit testimony by intervenors and Board witnesses. The applicants and the NRC staff filed replies which opposed review by the Commission. For the reasons discussed below,

EX-5

²In accordance with 10 CFR 2.786, we have also reviewed the Appeal Board's decision to determine whether it raises any issues warranting sua sponte Commission review.

Although we believe that

X-5

1. Institutional Bias

Intervenors contend they were improperly treated as interlopers. In addition to the specific examples of alleged mistreatment discussed below under the heading of due process, intervenors base their claim of institutional bias on the following novel argument. In intervenors' view, the court in GPU V. USA, Cir. No. 81-4950 (E.D. Pa. decided Nov. 24, 1982), (the GPU tort claim suit against the NRC), held that the NRC is subject to liability for damages resulting from negligent regulation or licensing. From this they concluded that the NRC has a financial interest in licensing proceedings. In particular, in an OL proceeding, the NRC could be liable for damages if the Commission conditions issuance of the OL on the fulfillment of more stringent requirements than imposed in the same areas at the CP stage. For example, in this case the NRC has a financial interest in supporting the seismic design fixed at the CP stage. If a more stringent seismic design were now imposed on the applicants, they would sue the NRC for damages resulting from negligent issuance of the CP.

EY 5

7

EX 5

┌

7

E15

L

2. Due Process and a Fair Hearing

Intervenors contend that the Licensing Board denied them due process by foreclosing litigation of the issue of the capability of the Cristianitos Fault, relitigating segmentation of the OZD and by admitting the FSAR without giving intervenors an opportunity to cross-examine its sponsors.

┌

EX 5

L

J

EX.5

7
x.5

Finally, intervenors contend that admission of the FSAR without an opportunity to cross-examine opponents was not harmless error. The FSAR is a vast document (11,000 pages) and they believe that no one knows the extent to which the Licensing Board relied on it to resolve contested issues.

EX-5

3. Inconsistent Use of the Term Conservative

Intervenors contend that the decisions below are arbitrary and capricious because they use the term "conservative" inconsistently and expeditiously. 1

EX-5

4. Failure to Credit Testimony by Intervenors and Board Witnesses

Both Boards below discussed in detail their reasons for weighing the various experts' testimonies as they did. In our view,

EX-5

II. Emergency Planning Issues

A. Appeal Board Decision

The second set of issues addressed in ALAB-717 pertained to the adequacy of certain aspects of the emergency planning for San Onofre. These issues related to whether (1) the applicants' warning system to notify the public was adequate in light of the absence of siren coverage for the populated areas across San Juan Creek, (2) offsite jurisdictions had the ability to monitor and assess radiological emergencies, (3) adequate emergency plans are in place to assure protective action on behalf of special segments of the "at risk" population, and (4) the intervenors were denied due process with respect to the Licensing Board's treatment of Federal Emergency Management Agency (FEMA) findings and testimony.⁴

1. Siren Coverage

The Licensing Board concluded that the applicants' 10-mile EPZ was too constricted because it did not afford siren coverage to about 30,000 people who lived in two small areas on the outer edge of the zone. The Board extended the EPZ to include those areas thus creating a gap in the siren coverage and imposed a license condition requiring the siren deficiency to be remedied within six months of operation. The Licensing Board ruled further, however, that the deficiency in coverage would not be grounds for denying a full power license because there was reasonable assurance within the meaning of 10 CFR

⁴All of these issues except #3 were in the intervenors' stay motion which was denied by the Appeal Board in ALAB-680. The Commission declined to review ALAB-680, but directed certification of the offsite medical arrangements issue to the Commission. CLI-82-27, September 24, 1982. Because of this certification, the Appeal Board did not address the issue of offsite medical arrangements in its decision on the merits of the appeal.

§50.47(c)(1) that "adequate compensating actions have been or will be taken." The evidence demonstrated that the affected populations would be notified within thirty minutes of an alert through a combination of emergency vehicles, helicopters, and existing siren coverage.

The Appeal Board upheld this finding and also noted that prompt notification of all people within the EPZ was not contemplated in the Commission's regulatory scheme governing public notification. See 10 CFR Part 50, App. E, IV.D.3; 10 CFR § 50.47(b)(5); NUREG-0654, App. 3 at 3-3.

2. Radiation Monitoring

The Appeal Board agreed with the Licensing Board that the applicants' radiation monitoring capabilities more than compensate for any deficiencies in the monitoring capabilities of local jurisdictions and, accordingly, there was no inadequacy in emergency planning on this matter. In addition, it also concluded that the deficiencies which do exist pertain to the evolving State of California planning and were determined not to be significant in light of the applicants' efforts, and the comparatively less extensive planning that is required and possible for the ingestion EPZ. ALAB-717 at 51.

3. Special Populations

The Appeal Board reviewed aspects of the emergency plans to assure that protective actions are adequate for several special segments of the "at risk" population. In this review, it determined that transportation arrangements for the elderly, the handicapped, and school children are in need of improvement, and so conditioned the operating licenses to (1) undertake an identification and listing of housebound people, and (2) develop and initiate a bus driver training program. The Appeal Board found no merit to the intervenors' claims that the emergency

plans are inadequate for boaters and persons in Riverside County and San Juan Capistrano.

4. Procedural Objections

The Appeal Board ruled on a number of intervenors' procedural objections to the testimony of FEMA. First, it determined that discussions between FEMA and the applicants did not violate the ex parte rule because FEMA is not a decisionmaker in Commission licensing proceedings. Next, it found that the Licensing Board did not commit error when it permitted the regional FEMA analyst to give testimony which contradicted or expanded upon the FEMA interim findings.⁵ Finally, the Appeal Board agreed with the intervenors that the Licensing Board erred in admitting into evidence the FEMA national office evaluation of the corrective actions then underway without a proper expert sponsor able to be examined on the preparation and contents of the evaluation. The Appeal Board did not find this error prejudicial, however, because the Board's decision on the adequacy of emergency planning was based on the evaluations of the FEMA regional office which were sponsored through an appropriate expert witness. The absence of a national evaluation was not critical in the Appeal Board's mind.

Petition for Review and Replies:

⁵The FEMA interim findings were issued on June 3, 1981 and were critical in various respects of the stage of offsite preparedness at San Onofre. The regional analyst testified to corrective actions and activities that had taken place following the issuance of the interim findings. The Appeal Board found that this testimony was approved by the FEMA national office, was consistent with the role of FEMA in NRC licensing proceedings to report on corrective actions, and was consistent with the FEMA/NRC Memorandum of Understanding and a recent amendment to the Commission's emergency planning regulations which contemplate a continuing evolution of FEMA information.

The petition for review of emergency planning issues has raised two allegations of error concerning the Appeal Board's determinations on the testimony of the FEMA regional analyst:

1. The Appeal Board erred in determining that the meetings and correspondence between the applicants and FEMA were not governed by the Commission's ex parte rule which would entitle intervenors to notice; and
2. The Appeal Board erred in determining that the admission into evidence of the FEMA national office evaluation of the ongoing applicant's corrective actions was not prejudicial error.

The applicants and the NRC staff filed replies which opposed review by the Commission of these procedural determinations in ALAB-717.

Analysis:

1. Ex Parte Rule

The issue of an alleged violation of the Commission's ex parte rule (10 CFR § 2.780) was raised by the intervenors in both their stay motion and on appeal. In both ALAB-680 and in ALAB-717 the Appeal Board disposed of the allegation by noting that nothing in the Commission's ex parte rule precludes conversations among parties, none of whom is a decisionmaker in the licensing proceeding. In ALAB-717, the Appeal Board discussed the additional argument that FEMA was effectively acting in a decisionmaking capacity because its finding is entitled to a rebuttable presumption. It concluded that such entitlement does not convert that agency into a decisionmaker.

|
L
EX.5

T
EX 5

2. Prejudicial Error

The intervenors assert that it was prejudicial error to admit into evidence opinion testimony regarding the FEMA national office evaluation of the corrective actions underway because that provided the basis for a Licensing Board "determination that an adequate FEMA finding will come in the future." Petition, p. 5. The FEMA testimony in dispute indicated that given the commitment and continuing efforts to correct the deficiencies noted in the FEMA interim findings, "it is believed [by the FEMA national office] that, provided the needed corrective actions are completed, there is reasonable assurance adequate protective measures can and will be taken in the event of a radiological emergency at SONGS II and III." ALAB-717, p. 67, n. 58. The admission of this testimony by the Licensing Board was determined by the Appeal Board to be in error because the FEMA regional witness considered himself

5

incompetent to answer questions regarding the national office views.

However, the Appeal Board found the error not to be prejudicial because the FEMA regional office conclusion as to the adequacy of offsite preparedness provided the evidentiary basis for the Board's decision. A national office conclusion was not critical because the Commission's regulations in 10 CFR § 50.47(a) contemplate a predictive finding of adequacy that need not await the rendition of a final FEMA finding.⁹ In addition, the Appeal Board noted that the corrective actions were straightforward and satisfactory to FEMA, and not controverted in any way by the intervenors. /OGC believes that

that

we believe

⁹In essence, the regulations recognize that an applicant might not have sufficient time to fully implement the emergency planning requirements before hearings on its operating license. Furthermore, the Memorandum of Understanding, supra, contemplates that FEMA will provide findings and determinations based on the current status of emergency preparedness at particular sites. /

EX-5

Herzel H.E. Plaine

Herzel H.E. Plaine
General Counsel

Attachment: ALAB-717

Commissioners' comments or consent should be provided directly to the Office of the Secretary by c.o.b. Tuesday, June 7, 1983.

Commission Staff Office comments, if any, should be submitted to the Commissioners NLT Tuesday, May 31, 1983, with an information copy to the Office of the Secretary. If the paper is of such a nature that it requires additional time for analytical review and comment, the Commissioners and the Secretariat should be apprised of when comments may be expected.

DISTRIBUTION:
Commissioners
OGC
OPE
SECY

SERVED MAR 07 1983

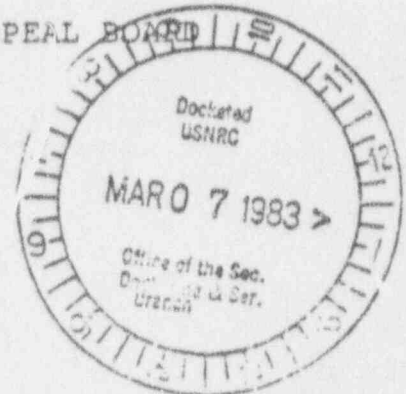
Release

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Stephen F. Eilperin, Chairman
Dr. W. Reed Johnson
Dr. Reginald L. Gotchy



In the Matter of)

SOUTHERN CALIFORNIA EDISON)
COMPANY, ET AL.)

(San Onofre Nuclear Generating)
Station, Units 2 and 3))

Docket Nos. 50-361 OL
50-362 OL

Richard J. Wharton, San Diego, California, for the intervenors, A. S. Carstens, et al., on seismology issues.

Charles E. McClung, Jr., Laguna Hills, California, for the intervenors, GUARD and A. S. Carstens, et al., on emergency planning issues.

David R. Pigott, Edward B. Rogin, Samuel B. Casey and John A. Mendez, San Francisco, California, and Charles B. Kocher and James A. Beoletto, Rosemead, California, for the applicants, Southern California Edison Company, et al.

Lawrence J. Chandler for the Nuclear Regulatory Commission staff.

DECISION

March 4, 1983

(ALAB-717)

We have before us consolidated appeals from the Licensing Board's January 11 and May 14, 1982 decisions, which together authorized the issuance of full power operating licenses for the San Onofre Nuclear Generating Station, Units 2 and 3. LBP-82-3, 15 NRC 61; LBP-82-39, 15

NRC 1163 (1982). Those decisions, respectively, dealt with matters related to the seismic design of the plants and their emergency plan. In denying stay requests sought as to each, we canvassed many of the issues that are again pressed before us on the merits of the appeals.^{1/} Because of that overlap and our reliance in this opinion on the stay decisions to dispose of many of the issues on appeal, we briefly recount those earlier decisions. Our opinion deals with the seismic issues first, then those on emergency planning. We conclude by affirming the Licensing Board's decisions, subject to certain license conditions that are designed to buttress San Onofre's emergency preparedness.

I

Our stay decision on seismic issues focused on the ability of crucial power plant safety systems to withstand the most severe earthquake that might affect San Onofre during its operating lifetime -- what NRC regulations term the "safe shutdown earthquake." 10 CFR Part 100, Appendix A, § III(c). This, in turn, involved two broad questions -- (1) whether the Cristianitos fault, about one-half mile from the plant, was capable of generating earthquake activity, and if not (2) whether the Offshore Zone of Deformation

^{1/} Southern California Edison Co. (San Onofre Nuclear Generating Station, Units 2 and 3), ALAB-673, 15 NRC 688 (1982), and ALAB-680, 16 NRC ___ (July 16, 1982) (stay decisions).

(OZD), the geologic feature that otherwise controlled San Onofre's seismic design, could generate stronger ground motion than San Onofre was designed to accommodate. We concluded that although the Licensing Board erroneously foreclosed intervenors from fully litigating the capability of the Cristianitos fault, that ruling did not prejudice intervenors. From our review of the record to that point, we found that the great weight of the evidence supported the view that the Cristianitos fault was not active; moreover, intervenors had neither presented, nor offered to present, contrary evidence of any moment. ALAB-673, supra, 15 NRC at 694-702.^{2/}

We next considered the second issue -- whether an earthquake occurring on the OZD could be expected to shake the plant site with ground accelerations greater than two-thirds of gravity, the acceleration that characterizes the earthquake the plant was designed to withstand. The

^{2/} While our decision on seismic issues was in the context of ruling on a stay motion, it nevertheless contained a detailed analysis of the merits of intervenors' claims. Thus, we remarked (ALAB-673, supra, 15 NRC at 714):

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.

Licensing Board examined and approved the propriety of that design basis earthquake based upon the characteristics of the OZD, the historic record, and the various earthquake methodologies that had been developed separately by the applicants and the NRC staff. LBP-82-3, supra, 15 NRC at 99-150. We too concluded, preliminarily, that the design was properly conservative.

In particular, we reached the following tentative determinations. We rejected intervenors' argument that the Licensing Board underestimated the design basis earthquake by treating the OZD as segmented, contrary to an agreement among the parties. Instead, we found nothing in the Board's decision to contravene the parties' agreement 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. ALAB-673, supra, 15 NRC at 702-06. We also rejected intervenors' argument that the Board underestimated the maximum magnitude earthquake that might be expected on the OZD by accepting the testimony of the principal staff witness, Dr. David B. Slemmons, who intervenors claimed had calculated the "mean" earthquake rather than a more conservative event. We explained how intervenors had misapprehended Dr. Slemmons' methodology, set out the many conservatisms in his testimony, and concluded that it would not have been correct

or reasonable to add an additional standard deviation to the earthquake magnitude he had estimated. Id. at 707-09. ^{3/}

The determination of the maximum magnitude earthquake that might affect San Onofre is only one step toward the most critical portion of the 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 on the controlling fault at the point 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. Our stay decision discussed, and found unwarranted, four separate objections that intervenors had raised to the Licensing Board's choice of a peak ground acceleration of

^{3/} Dr. Slemmons' methodology, we said, "(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." Id. at 709.

two-thirds the force of gravity (0.67g). Id. at 709-14.^{4/}

On appeal, intervenors again press these claims and raise new ones as well. Their principal contention, however, and the one to which intervenors' oral argument was

^{4/} From our review of the record to that point, we found that the Licensing Board had fairly evaluated the testimony of United States Geological Survey (USGS) scientist Dr. David M. Boore and of Board witness Dr. Enrique Luco. In discounting the reliability of Dr. Boore's higher estimate of peak ground acceleration we noted, among other things, that Dr. Boore himself stated that his "prediction equations are not constrained by data, and the results should be treated with caution." Id. at 711. Dr. Luco's views on peak ground acceleration were offered without elaboration, and he declined to recommend any particular value for San Onofre's design. Id. at 712-13.

We also concluded that high peak vertical accelerations were not significant for the structural safety of San Onofre. This was for three reasons. First, the vertical peaks that had been observed elsewhere 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, such as that from the Imperial Valley earthquake of 1979, occurred early on, before the maximum horizontal motions. Third, 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. Id. at 712.

Finally, we found that the possible "focusing" of seismic waves with attendant increased earthquake ground motion would not be a problem for San Onofre because the power plants stand off to the side of the OZD (the controlling geologic feature that might generate earthquake activity) and thus are not positioned to experience the effects of focusing. Id. at 713-14.

almost wholly devoted, is the claim that they were wrongly and prejudicially foreclosed from litigating the capability of the Cristianitos fault. Because of the prominence intervenors give to this argument, some additional discussion by us is warranted.

A. The Cristianitos Fault

1. Foreclosure

At the outset, we adhere to the view expressed in our stay decision that the Licensing Board erred in foreclosing intervenors from fully litigating the capability of the Cristianitos fault (id. at 694):

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 [emphasis in original].

That ruling, we said, was "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." Id. at 695. We explained that, even in its broadest readings, the judicial "standard for determining whether persons or organizations are so closely related in

interest as adequately to represent one another -- and thus to foreclose further litigation -- . . . has not encompassed the situation of a generally shared viewpoint." Id. at 695-96 (footnote omitted). Rather, it requires virtual representation of one group by another.

The Licensing Board, together with the staff and the applicants, are of the view that Commission licensing proceedings warrant a more relaxed standard than would be applied in a court case. This is so, it is argued, because our proceedings are meant to adjudicate matters of public interest rather than private rights. The staff and Advisory Committee on Reactor Safeguards review at the construction permit stage of significant safety matters, we are told, is sufficient to discharge that public interest function. See LBP-82-3, supra, 15 NRC at 80-82. We do not agree.

While it is certainly true that nuclear licensing proceedings entail matters of generalized public interest, Congress recognized that construction or operation of a nuclear power plant can affect individuals and their private interests as well. Section 189(a) of the Atomic Energy Act, as amended, 42 U.S.C. 2239(a), accords any such person a right to be heard on the question whether a license to construct or operate a nuclear power plant should be granted. To be sure, that right to be heard is subject to the imposition of reasonable procedural requirements, BPI v. AEC, 502 F.2d 424, 428 (D.C. Cir. 1974), and the judicial

doctrines of res judicata and collateral estoppel would be amenable to such administrative modification. Thus, our stay decision suggested that 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. 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 such a showing as "changed circumstances" or "newly discovered evidence". ALAB-673, supra, 15 NRC at 696. But our point, then as now, is that, insofar as safety issues are concerned, the Commission has not chosen to pursue either course. And Commission practice has been to determine the litigability of issues at the operating license stage with reference to conventional res judicata and collateral estoppel principles. Id. at 696-97. Given that practice, the Commission's undoubted power to change it (at least prospectively), and the statutory right of interested persons to be heard in Commission licensing proceedings, we are unwilling to adopt the foreclosure

principle advanced by the Licensing Board.^{5/}

2. Lack of Prejudice

We also adhere to our view that the Board's erroneous foreclosure ruling had little, if any, impact on the proceeding and did not prejudice intervenors. Our stay decision explained that intervenors' affirmative case on the capability of the Cristianitos fault was fully set out in the record, and that they had had a satisfactory opportunity to cross-examine Dr. Shawn Biehler, the applicants' consultant whose testimony covered the Cristianitos fault in its full historical range. The only evidentiary gap concerned pre-1973 information bearing on the fault's capability which might have been elicited from the NRC staff witnesses on cross-examination. Id. at 697. As to that,

^{5/} We need not decide here whether an intervenor is obliged to plead the basis for a contention with a greater degree of specificity than is typically required where its subject matter (here the capability of the Cristianitos fault), has previously been investigated at an earlier licensing stage. That was not the ground of the Licensing Board's foreclosure ruling and the occurrence of the two earthquakes in 1975 near San Juan Capistrano could have provided the factual predicate for meeting such a higher threshold requirement. See p. infra.

Had it been necessary for them to reach the question of a more stringent threshold, Dr. Johnson and Dr. Gotchy would have held that such a requirement does exist and, further, that the proposed testimony of Mr. Simons, taken as the sole basis for a contention that the Cristianitos fault was active, would not have been sufficient to meet it. See ALAB-673, supra, 15 NRC at 700-01.

intervenor have never offered to show what, if anything, they might have proven. If it had been anything of substance, we expect that they would have alluded to it in their brief or at oral argument.

3. Non-Capable Fault

Indeed, intervenors' case on the claimed capability of the Cristianitos fault centered on post-1973 events -- more particularly, on two small earthquakes of magnitude 3.3 and 3.8 which occurred on January 3, 1975 near San Juan Capistrano. See p. ___ infra. It was intervenors' position that, given the uncertain location of the Cristianitos fault at depth, those events could have occurred on it. ^{6/} As we explained in our stay decision (id. at 699):

The earthquakes were of concern to the staff: had the Cristianitos fault generated them it would

^{6/} Applicants' witnesses described the Cristianitos fault as a "westward-facing listric normal fault." Testimony of Dr. Perry L. Ehlig, on Contention 4 at 13. See Tr. 1090-91. According to Dr. Ehlig, faults of this type would tend to flatten (i.e., the plane of the fault becomes parallel to the earth's surface). On cross-examination the witness pointed out that while an oil well drilling gave at least one constraint on the possible depth of the flattened fault, there was really no data that could be used to fix its actual depth. Tr. 1091, 1096, 1099. See Testimony of Dr. Ehlig on Contention 4, Figure PLE-M. He did agree, however, that under the concept of a flattening of the fault plane extending to the west, the proposed location of the hypocenters of the 1975 earthquakes could be fairly close to the fault plane. Tr. 1099. Dr. Biehler also discussed this possibility in his direct testimony and upon cross-examination by intervenors' counsel. Tr. 3656-57, 3933-36.

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.

The most telling of these investigations was the focal mechanism study performed by Dr. Biehler. A focal mechanism study describes the manner in which the ground moves during an earthquake and is based on the sense (compression or extension) of the first earthquake motions received at those seismographic stations that record the event. If the recording stations are sufficient in number and well located, a focal mechanism plot can be developed to determine the possible orientation of the fault on which the motion took place, and the type of motion (e.g., strike-slip, normal, thrust). See generally Tr. 3652-56.

In the case of the 1975 events, there were first motion data from thirty surrounding stations sufficient to develop focal mechanism plots for each. Testimony of Dr. Biehler on Contention 1 at 7; Tr. 3656. ^{7/} Ordinarily such plots can only establish the orientation of two possible fault planes for the motion. Here, because there were two events closely related in time and space, having virtually

^{7/} Intervenor's witness Mark R. Legg apparently did a focal mechanism study too, but it was not offered into evidence. Mr. Legg indicated that his focal mechanisms were consistent with those of Dr. Biehler. Tr. 5235-36.

identical focal mechanism solutions, a firmer determination is possible. Both of the possible fault plane orientations developed for the two events were oblique to the direction of the Cristianitos fault which trends approximately north-south. One direction, however, was consistent with locating both events on the same, northeast-trending feature aligned with the Trabuco Canyon. Tr. 3657-60.

Moreover, the type of earthquake motion determined for both events was "strike-slip with a significant thrust component." Testimony of Dr. Biehler on Contention 1 at 7. The Cristianitos fault is normal, or listric normal, and hence the type of motion that might take place there is unlike the motion observed from the focal solutions. See id. at 8; Tr. 3661-62. See also note 6, supra.

Thus, in two crucial aspects -- fault orientation and type of fault motion -- the focal mechanism solutions of the 1975 events demonstrate that the Cristianitos fault was not the source of motion. In addition, as staff witness Dr. Leon Reiter pointed out, if the Cristianitos fault were flattened enough to bring it close to the projected location of the 1975 earthquakes (see note 6, supra), it would have to be nearly in a horizontal plane. The focal mechanism solutions, however, indicate motion on a steeply vertical fault. Tr. 5745-46. Dr. Reiter concluded that "one would have to be arbitrary with the location of the fault and disregard the focal mechanisms to find association of these particular earthquakes consistent with the fault plane,

however one would project it." Tr. 5746. 8/

8/ As noted in our stay decision, intervenors' witness, Mark R. Legg, claimed that the change in the regional stress field since the formation of the Cristianitos fault could lead the fault to exhibit a different motion now. ALAB-673, supra, 15 NRC at 701-02. However, Mr. Legg conceded on cross-examination that he had no historical evidence 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. In essence, the direction of fault motion would have to be reversed to support Mr. Legg's hypothesis. See Tr. 5246.

Mr. Legg's hypothesis was not supported by other witnesses. Dr. Ehlig described the Cristianitos fault in its present posture as being "buttressed and [unable to] move." Testimony of Dr. Ehlig on Contention 4 at 29. See also Tr. 1102-03. This assessment is also reflected in the testimony of applicants' witness Jay L. Smith, who stated that renewed movement on the Cristianitos is precluded due to stress changes since its formation. Testimony of Mr. Smith, fol. Tr. 887, at 38. Dr. Biehler, when similarly questioned, responded that the Cristianitos was not aligned to slip under the current stress regime. Tr. 3989.

The applicants' rebuttal witness, Dr. David M. Hadley, also addressed Mr. Legg's testimony on the movement of the Cristianitos under the new stress regime. Dr. Hadley pointed out that Mr. Legg considered only one of the three relevant stress dimensions. He thus found Mr. Legg's theory to be "quite incomplete." Tr. 6392-93. Dr. Hadley was of the view that when the relevant stress orientations were considered, the Cristianitos fault, itself oriented north-south, is not favorably oriented for movement under a north-south compressive stress regime. Tr. 6392-94. Dr. Hadley was not cross-examined, nor was his testimony otherwise challenged.

Thus, our further examination of Mr. Legg's testimony confirms the tentative conclusion we reached in our stay decision that the Cristianitos fault is not an active fault.

B. Other Possible Controlling Faults

Intervenors also claim that the applicants failed to investigate adequately the possibility that other geologic features closer to San Onofre than the OZD (which is eight kilometers distant) could control the plants' seismic design. Specifically, intervenors contend that the applicants' investigations do not rule out the possibility that (1) the Cristianitos Zone of Deformation (CZD) ^{9/} is a branch of the OZD capable of generating earthquake activity, and (2) the CZD runs under San Onofre or connects with onshore features near San Onofre that are capable of causing the ground to rupture. Carstens, et al. Brief in Support of Exceptions (Feb. 25, 1982) at 50-57 (Intervenors' Brief on Seismic Issues). In essence, intervenors claim that movement on the OZD might initiate movement on the CZD, causing movement ultimately on the Cristianitos fault or other features onshore, and hence at

^{9/} The Cristianitos Zone of Deformation is not synonymous with the Cristianitos fault and its name is not intended to imply a structural relationship with the Cristianitos fault. The name was coined by two geologists, Drs. H. G. Greene and M. P. Kennedy, simply because the Cristianitos fault is nearby the CZD. Tr. 2139-40. The CZD refers to "an area of the sea floor lying to the south of the San Onofre site and between the site and the OZD." LBP-82-3, supra, 15 NRC at 90-91.

the San Onofre site.^{10/}

To establish a possible connection between the OZD and the CZD, intervenors principally rely upon a review performed at the staff's request by Drs. H. G. Greene and M. P. Kennedy of the USGS and the California Division of Mines and Geology, respectively. Tr. 6450-51. The results of that review, and of a subsequent update using additional high resolution data specifically aimed at exploring the relationship of the OZD and CZD, are set out as Appendices

^{10/} 10 CFR Part 100, Appendix A, § III(g) defines "capable fault", in pertinent part, 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.

All parties are in agreement that the OZD contains at least one capable fault (i.e., it shows evidence of recent movement). See Staff Exh. 1, "Safety Evaluation Report," NUREG-0712 (February 1981), at 2-34, 2-50 through 2-51 [SER]. The questions at issue here are whether the investigations have been sufficient to determine whether the OZD is structurally related to the CZD, and whether movement on the OZD could be reasonably expected to lead to movement on the CZD.

F and G to the NRC staff's Safety Evaluation Report [SER], note 10, supra.

Drs. Greene and Kennedy concluded that "[t]he seismic reflection data . . . show that a fairly continuous fault zone extends south to southeastward offshore from [San Onofre] to within 1 km of the 'OZD,' where a projected connection is possible." SER, Appendix F at F-8.^{11/} While the applicants thought that no connection existed,^{12/} in actuality their position was not much at odds from that of Drs. Greene and Kennedy. No witness's confidence level was high because of the difficulty of interpreting the data.

^{11/} Elsewhere, Drs. Greene and Kennedy stated that the CZD "appears to merge with, or is truncated by, the OZD." Tr. 2397. And again (Tr. 2398),

in using our word "merge," for instance, what we see is that the CZD is appearing to run into the OZD. We do not see an absolute intersection, as for instance two railroad tracks coming together. We do not put a point on where the two railroad tracks come together.

So we use the word "merge," or there could be a "truncation" of some sort there. But we cannot define that, and that is why we use "appear" in that relationship.

^{12/} Dr. David G. Moore concluded that "the CZD shows its nearest faulting on the central shelf to be approximately 10,000 ft. o[r] 3.6 km away from the [OZD]. . . ." Therefore, he "cannot support a postulated connection between the [OZD] and the faults of the central shelf area [of the CZD]." Testimony of Dr. Moore on Contention 2 at 46.

See Tr. 2962, 2975-76.^{13/}

This lack of certainty does not mean, as intervenors contend, that the applicants' investigation of a possible CZD/OZD relationship was inadequate. To the contrary, the Licensing Board accurately described the applicants' effort to explore this issue as "massive". LBP-82-3, supra, 15 NRC at 91. More than 1,000 kilometers of seismic profile transects of the San Onofre shelf region were taken with an average line spacing of about 400 meters. Testimony of Dr. Moore on Contention 2 at 7, 9, 49. Indeed, Dr. Greene testified that the seismic profiling in the San Onofre area provided the "greatest density of track lines that I've ever dealt with as far as an area of this size. I've not had the fortune to have this much data available to me." Tr. 2282. Dr. Kennedy was also of the view that the data were extensive. Tr. 2282-83. The inability to arrive at a more definitive assessment was attributable not to a faulty investigation, but to the nature of the area being investigated. See note 13, supra. See also Tr. 2282-86.

^{13/} Applicants' expert Dr. Moore suggested that the possible connection between the CZD and OZD postulated by Drs. Greene and Kennedy results from a misinterpretation of the seismic data as a result of signal cross-overs on the relatively steep land of the San Onofre Shelf Syncline. However, he conceded that because the geometry of the structures has generated side echo cross-overs, the data are somewhat ambiguous. Testimony of Dr. Moore on Contention 2 at 46-47.

While the possibility of a CZD/OZD interconnection cannot totally be discounted, it is nonetheless not of critical safety significance. At the asserted point of merger the CZD is overlaid by unfaulted strata of the late Miocene age. Testimony of Dr. Moore on Contention 2 at 47-48-49. This means that any active faulting in the area ceased several million years ago. On that basis, the CZD may be disregarded as a prospective source of earthquake activity. See Tr. 2971, 3074-75; LBP-82-3, supra, 15 NRC at 91. See generally 10 CFR Part 100, Appendix A, § III (g). 14/

Intervenors also claim that the applicants did not investigate thoroughly the possibility of connection between the CZD and onshore features. Again, intervenors rely upon the testimony of Drs. Greene and Kennedy, who mapped the CZD to within 12,000 feet of San Onofre and claimed that a further extension north, towards the shoreline, "could be one of many possibilities." Tr. 2409. See SER, Appendix F

14/ Staff witness Robert H. Morris of the USGS concurred that the CZD is not capable. He would not expect movement on the OZD to initiate movement on the CZD. Tr. 6036-37. See also SER, Appendix G at G-4.

at F-24; Intervenors' Brief on Seismic Issues at 55-56.^{15/}
 That rather hesitant evaluation^{16/} is dispelled by
 substantial evidence that is fully detailed in the Licensing
 Board's decision. LBP-82-3, supra, 15 NRC at 175-79. See
 generally id. at 168-81.

Contrary to intervenors' position, we find that the
 CZD/onshore connection possibility was adequately explored.
 The combined testimony of applicants' witnesses Drs. Roy J.
 Shlemon and Moore demonstrates that there are undisturbed
 platforms offshore between San Onofre and the CZD that are
 40,000 to 80,000 years old. Testimony of Dr. Shlemon on
 Contention 2 at 9-10; Testimony of Dr. Moore on Contention 2
 at 21-22, 48; Tr. 3171-72, 3183-87. See also Tr. 6463-66,

^{15/} Intervenors again argued the absence of definitive
 data. According to Dr. Kennedy, as to near shore
 features there was (Tr. 2409)

a very small amount of data . . . and . . . the
 data that is present is of fairly poor quality
 because of the very shallow water and a very high
 level of ambient noise near the wave zone.

^{16/} Dr. Kennedy further conditioned his response by stating
 (Tr. 2409):

We haven't worked north of where the Cristianitos
 zone of deformation has been shown on this map so
 again, in a purely speculative fashion, this is
 one of several possibilities, I would imagine.

6508. Dr. Shlemon also identified a wave-cut platform in the sea cliff, along the coastline, which was formed during the last major interglacial period about 125,000 years ago. Tr. 3189-92; testimony of Dr. Shlemon on Contention 2 at 7-8. That feature exhibits no sign of offsets or displacements that would suggest the CZD projects onshore. See Tr. 3202-05. See also Testimony of Dr. Shlemon on Contention 2 at 10.^{17/} Dr. Shlemon thought it "highly unlikely" that there are undetected displacements of the 125,000--year platform in the vicinity of the sea cliffs. Tr. 3211. ^{18/} Nor is there evidence that the faults or folds of the CZD project onshore in any of the marine and river terraces in the San Onofre area. Tr. 3208-09. Similarly, Dr. Moore testified that his seismic profiles of the immediate offshore area showed no evidence of faults or folds. Tr. 2970, 3009-12. He was clear from his investigations that the CZD features die out well before they approach the shoreline. Tr. 2978. See also Tr. 3082-83.

^{17/} Only in the area of the San Mateo flood plain where erosion has washed away the terrace is the platform not continuous. Tr. 3202.

^{18/} Consistent with Dr. Shlemon's testimony, there is record evidence that terrace 1 has a minimum age of 120,000 years. See Applicants Exh. 27 at 8-9, 15.

Intervenors' claim that applicants failed to investigate adequately a possible connection between the CZD and particular onshore features (denominated "A" and "B") is also refuted by substantial evidence of record. The Licensing Board fully recounts that investigation (which, we would note, consumed 221 person/days) in its decision. LBP-82-3, supra, 15 NRC at 151-59. In essence, the "A" and "B" features have entirely horizontal senses of motion not compatible with motion on the Cristianitos fault or any other shear zone. They are not the surface manifestation of either a fault or zone of deformation located within or beneath the San Mateo formation.^{19/} Rather, these features are discontinuous, ancient "joints" not faults: they are minor elements of the San Mateo formation, that die out at the sea cliff and have no safety significance. Testimony of Jay L. Smith on Contention 3 at 12. See generally Tr. 2698-705.

C. Determination of Maximum Magnitude Earthquake

Our stay decision tentatively rejected intervenors' arguments that contested the Licensing Board's determination of the maximum magnitude earthquake that might be expected

^{19/} The San Mateo formation is a formation of marine bedrock laid down several million years ago. See Testimony of Dr. Ehlig on Contention 4 at 14; Tr. 3205.

on the OZD. See pp. __, supra.^{20/} On appeal they renew those arguments, and press as well a claim not raised in the stay papers -- that the Licensing Board's reliance on the slip rate method propounded by applicants' witness, Edward G. Heath, constitutes reversible error. ^{21/} We are satisfied

20/ Intervenors' had asserted that the Board erred in (1) treating the OZD as segmented, contrary to the parties' understanding, and (2) crediting Dr. Slemmons' testimony, which assertedly was not sufficiently conservative.

21/ Mr. Heath's approach is based on comparing the degree of fault activity on the OZD with that of similar faults in the southern California region and in similar tectonic environments around the world. From his degree of activity correlations, Mr. Heath concluded that slip rate can be used to provide an estimate of the maximum magnitude earthquake that may be associated with the OZD. Testimony of Mr. Heath on Contention 4 at 6-7; Tr. 1339-41.

As the Licensing Board further explained (LBP-82-3, supra, 15 NRC at 85):

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.

The slip rate method devised by Mr. Heath studies the (ibid.)

relationships between slip rates and magnitudes of earthquakes that have actually occurred on particular faults.

* * *

(FOOTNOTE CONTINUED ON NEXT PAGE)

that the discussion in our stay decision fairly disposes of the issues regarding the maximum magnitude earthquake there addressed. ALAB-673, supra, 15 NRC at 702-09. We therefore confine our discussion here to the issues raised by intervenors' new argument.

Preliminarily, however, we must note that the Board relied on several analytical techniques in addition to that of Mr. Heath in reaching its conclusion that an M_s 7 earthquake is appropriately conservative.^{22/} These include the fault length/magnitude study performed by Dr. Slemmons, the historical analysis of seismicity in the Southern California area that is set out in (among other places)

21/ (FOOTNOTE CONTINUED FROM PREVIOUS PAGE)

[T]he Applicants' . . . 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.

22/ M_s stands for "surface wave magnitude". It is a measure of magnitude used to describe earthquakes of about magnitude six and above. See LBP-82-3, supra, 15 NRC at 101-02; Pacific Gas and Electric Co. (Diablo Canyon Nuclear Power Plant, Units 1&2), ALAB-644, 13 NRC 903, 930-31 (1981).

the staff's SER, and the geologic seismicity analysis conducted by Drs. Stewart W. Smith and Ehlig. See generally LBP-82-3, supra, 15 NRC at 99-123. The Licensing Board carefully limited its reliance on Mr. Heath's work (id. at 116):

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 [maximum magnitude earthquake] 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

In light of the limited use made by the Licensing Board of the slip rate/magnitude methodology, intervenors' concerns as to its propriety is not a matter which, if decided in their favor, would constitute reversible error. We nonetheless proceed with our analysis of intervenors' claims. 23/

23/ Intervenors recognize that the Licensing Board's reliance on the slip rate/magnitude method was limited, but claim that nothing else supports the choice of an M 7.0 earthquake as a maximum. Intervenors' Brief on Seismic Issues at 28-29. As noted in text we reject that argument. Our stay decision specifically pointed out that (ALAB-673, supra, 15 NRC at 709 n.40):

The choice of a M 7.0 safe shutdown earthquake for San Onofre is amply supported by [Dr. Slemmons' fault length/magnitude study and] other expert testimony in the record. Thus applicant's expert, [Mr.] 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 [Mr.] Heath on Contention 4,

The principal shortcomings intervenors find with Mr. Heath's analysis are the (1) use of a limited historic data base, (2) exclusion from the data of Japanese faults and the El Alamo earthquake, (3) absence of a deterministic explanation to define the slip rate/magnitude relationship, (4) unwarranted reliance on a single data point, and (5) lack of an established slip rate for the OZD. See generally Intervenor's Brief on Seismic Issues at 28-37.^{24/} We deal with each argument in turn.

23/ (FOOTNOTE CONTINUED FROM PREVIOUS PAGE)

Figure 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.

* * *

So too, as already noted supra [15 NRC at 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.

24/ We rely on the Licensing Board's discussion as to those of intervenors' arguments that are not discussed here. See generally LBP-82-3, supra, 15 NRC at 115-19.

1. The historic record of California earthquakes extends back only about 200 years, and the instrumental record of world earthquakes only about 50 years. Yet the limited nature of this historic data is not a deficiency peculiar to the slip rate method of determining maximum magnitude. The historic record is what it is: its uses and limitations are the same whether correlations of earthquake magnitude are sought as to slip rate, fault length, surface rupture length, or any other geologically relevant consideration. Moreover, the likelihood that maximum or near maximum earthquakes will have been observed for a given range of slip rates increases as more faults are examined, thus adding confidence to the historic data. Tr. 1499. Observations suggest that truly large magnitude earthquakes in California occur only on active faults exhibiting large slip rates, and that earthquakes on specific strike-slip faults tend to be very much like their predecessors. Tr. 1438, 1447, 4898; Testimony of Mr. Heath on Contention 4 at 24-25. And, of course, the geologic record extends the historic record far into the past, hundreds of thousands of years and longer. The geologic and tectonic records of the OZD strongly support the conclusion that the OZD has not had an earthquake approaching a magnitude $M_s 7$ over the past million years. See note 23, supra.

2. Intervenors suggest that the applicants selectively eliminated data which, if included, would have yielded a higher predicted maximum magnitude earthquake for the OZD. In particular, they question the exclusion of data from earthquakes in Japan and from the 1956 El Alamo earthquake on the San Miguel fault in Baja California. Intervenors' Brief on Seismic Issues at 32.

Mr. Heath testified that the applicants sent a geologist and seismologist to Japan to meet with a number of leading Japanese geologists and seismologists in order to obtain their latest earthquake data. The applicants' consultants learned that (1) the tectonic style of the Japanese strike slip faults is very dissimilar to that in Southern California (i.e., in Japan the style is block faulting as opposed to linear en echelon faults, and the faulting occurs over a deep major zone of plate subduction as opposed to the translational faults occurring over the boundary of two large tectonic plates), and (2) "there are no solid slip rate data on [Japanese] strike-slip faults that have had major events" Tr. 1406-07. See also Tr. 4043-44; Applicants' Exh. 3, Figure EGH-8. This information went uncontradicted. Intervenors' witness, Dr. James N. Brune, admitted that he had no familiarity with Japanese slip rate data, data that would be necessary to include Japanese earthquakes in a slip rate/magnitude correlation. Tr. 4301. Both he and another intervenors'

witness, Dr. Clarence R. Allen, also agreed that there could be a difference in fault-caused earthquakes between California and Japan. Tr. 4567-68, 4884-85. Drs. Reiter and Slemmons testified for the staff that exclusion of the Japanese strike-slip data was justified by the dissimilar tectonic settings and difficulties in measuring slip rates. Tr. 5819-20, 6159, 6196-98, 6222-24, 6256-61, 6271-72. This testimony adequately supports exclusion of the Japanese data from Mr. Heath's slip rate/magnitude analysis.

The 1956 El Alamo earthquake was a magnitude 6.8 earthquake which took place on the San Miguel fault. There is, however, no definitive information on the slip rate on the fault. Tr. 1487. Both Dr. Ehlig and intervenors' witness, Dr. Gordon Gastil, testified that it has not been possible to determine the time period over which the offset along the San Miguel fault occurred.^{25/} Without that information, a slip rate cannot be calculated. Tr. 1071-72, 5126-27. ^{26/} The absence of reliable slip rate data

^{25/} Intervenors' witness Dr. Brune set out some slip rate values in his direct testimony (Brune, fol. Tr. 4122, at 17-18), but on cross-examination admitted that the time periods he had used to generate those values were arbitrarily chosen. Tr. 4280-81.

^{26/} To obtain a slip rate value for a fault one must divide a measured, or inferred, displacement across the fault by the time period over which the movement took place. Tr. 1486-87.

justifies the exclusion of the 1956 El Alamo earthquake as well.

3. The absence of a fully satisfactory deterministic explanation for the slip rate/magnitude method does not invalidate its utility. The relevant Commission regulations, 10 CFR Part 100, Appendix A, assume that the state of knowledge of earthquake mechanisms and of the propagation of seismic waves from source to site has not yet reached the point of precise predictability. It is for this reason that earthquake risk is assessed through a variety of methods, conservatively applied. Moreover, Mr. Heath did provide a physical (if not completely deterministic) explanation for his slip rate/magnitude correlation. On cross-examination by Dr. Brune, Mr. Heath noted that, for low slip rates, the process of fault creep allows strain to be released aseismically over a long period of time. Thus, strain (i.e., differential movement across the fault) does not build to the point of sudden release in an earthquake. Tr. 1440, 1446. This ability of low slip rate faults to relieve strain aseismically over a long period of time provides a plausible physical basis for the empirical observations presented in Mr. Heath's slip rate/magnitude curve.^{27/}

^{27/} It was Dr. Brune's opinion that the slip rate/magnitude relationship merely expressed the probability that large earthquakes were less likely to occur on faults with low slip rates. Tr. 4274-76.

4. Intervenors assert that the shape of Mr. Heath's slip rate/magnitude curve is controlled by a single data point at the low slip rate end which, if in error, would cause the entire curve to be shifted to a higher magnitude. To the contrary, Mr. Heath pointed out that the shape of the curve is established by approximately eight data points, most of them lying in the range of large slip rates and higher magnitude earthquakes. Tr. 1447. Our review of the curve, and the bases upon which it was developed, leads us to accept Mr. Heath's position.^{28/}

^{28/} The slip rate/magnitude plot is a representation, for each of a number of appropriately chosen faults, of the maximum known earthquake on that fault, plotted against the measured slip rate for the fault. A bounding curve, the maximum earthquake limit (MEL), is drawn to the right of all points to represent the maximum expected earthquake for faults of a given slip rate. Testimony of Mr. Heath on Contention 4, Figure EGH-M. See generally *id.* at 23-28. To the left of this line many points could be plotted representing less-than-maximum magnitude events on the various faults. Tr. 1438.

Applicants investigated essentially all the strike-slip faults in California that were ten kilometers or longer in an attempt to bolster the lower portion of the curve with more data. This effort provided little quantitative support for the MEL line, because there were virtually no earthquakes large enough to measure on these faults, and the exact slip rate values needed to plot the existing data were not available. See Tr. 1442-43, 1447-50; Applicants' Exh. 34. Mr. Heath notes, however, that of this large number of low slip rate faults none had resulted in significant earthquakes (*e.g.*, events exceeding the MEL line). Tr. 4037-43. See also Tr. 4048-61, Applicants' Exh. 3, Figure EGH-10. This in itself provides qualitative support for the validity of the MEL line at low slip rates. See Tr. 1442, 1449.

5. Intervenors contend that no clear slip rate has been established for that portion of the OZD closest to San Onofre. Intervenors' Brief on Seismic Issues at 30. We are meant to infer that no reliable estimate of a maximum magnitude earthquake on the OZD is possible. We disagree.

The earthquake potential of the OZD was modelled on slip rate data from its most seismically active segment, the Newport-Inglewood Zone of Deformation (NIZD). Mr. Heath explained that of the three portions of the OZD, the NIZD has the highest levels of both historical and recorded seismic activity. Its structure also suggests a greater seismic potential than the other segments. Testimony of Mr. Heath on Contention 4 at 8-9, 12, 16-17; Tr. 1350-53. ^{29/} Thus, use of the NIZD as a model was an acceptably con-

^{29/} In particular, Mr. Heath testified (Testimony on Contention 4 at 16-17):

The NIZD is a representative model of the OZD because of the similarities in structural style among the three elements of the OZD, and because of the extensive and high-quality data available regarding the style and amount of the deformation along the NIZD. The available surface and subsurface geologic data allow a higher degree of accuracy in assessing the amount and rate of faulting and folding for the purpose of estimating the maximum earthquake to be assigned to the OZD. Of the three elements of the OZD, the NIZD has by far the highest levels of both historical and recorded seismic activity. It has produced two damaging earthquakes, one in Inglewood in 1920, having an estimated magnitude of 4.9, and the

servative approach to take.

In sum, our review of the record finds no error in the Licensing Board's analysis of the slip rate/magnitude method of determining maximum magnitude. It is a reasonable supplement to the other methods now used for such purposes, all of which suggest that an M_s 7 earthquake on the OZD is the maximum reasonably to be expected. We have no reason to depart from the conclusion reached in our stay decision that the San Onofre seismic design is adequately conservative.

ALAB-673, supra, 15 NRC at 714.

D. Procedural Objections

Intervenors object to the Licensing Board's admission into evidence of the applicants' 30-volume Final Safety

29/ (FOOTNOTE CONTINUED FROM PREVIOUS PAGE)

other in Long Beach in 1933, having a recorded magnitude of 6.3. The NIZD is considered to be a conservative model for the other segments because (1) it has a higher level of historical seismicity; (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 [South Coast OZD] or the [Rose Canyon Fault Zone]; and (4) it 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.

Analysis Report (FSAR). ^{30/} Their objections are essentially twofold: first, that applicants did not properly authenticate or identify the FSAR; second, that intervenors were denied an adequate opportunity for cross-examination because the Board did not require applicants' witnesses to sponsor particular portions of the FSAR. Intervenors' Brief on Seismic Issues at 58-59.

These questions are largely theoretical because the Licensing Board relied upon the FSAR for only two, neither critical, of its hundreds of findings.^{31/} We nonetheless

^{30/} By regulation each operating license application must include a final safety analysis report:

The [FSAR] shall include information that describes the facility, presents the design bases and the limits on its operation, and presents a safety analysis of the structures, systems, and components and of the facility as a whole

10 CFR § 50.34(b). The information and analyses required of such a report are extensive. See generally 10 CFR § 50.34(b)(1)-(8).

^{31/} The FSAR received very little attention from either applicants or the Licensing Board. Applicants' proposed findings of fact and conclusions of law (September 3, 1981) do not cite the FSAR at all. The Licensing Board mentions the FSAR only twice in its seismic decision and cites independent authority for the same conclusions. On the safe shutdown earthquake issue the Board lists the FSAR as one source for the proposition that the San Onofre area historically has not been an area of high seismic activity. LBP-82-3, supra, 15 NRC at 103 (Finding of Fact #16). The Board

address the questions because they are pertinent to a later point (see pp. __, infra) and may be of general interest for future cases.

The identification issue is straightforward. The requirement of authentication or identification as a condition precedent to the admissibility of evidence is satisfied by evidence sufficient to support a finding that the matter in question is what its proponent claims. Fed. R. Evid. 901(a). ^{32/} Here, the applicants' witness, Wesley C. Woody testified that he was responsible for managing and supervising the preparation and revision of the San Onofre license applications, of which the FSAR is a part. Tr. 709-10. While he had not reviewed the 30-volume FSAR "page for page," he had perused it prior to testifying and was satisfied that it reflected the various amendments

^{31/} (FOOTNOTE CONTINUED FROM PREVIOUS PAGE) also cites the SER and applicants' pre-filed testimony (each of which refers to the FSAR as basic source material and expands upon it) for the same proposition. On the question of whether the OZD extends into Baja California, the Board cites the pertinent discussion in the SER and adds a parenthetical reference to the FSAR, clearly intended as secondary authority. Id. at 111 (Finding of Fact #69).

^{32/} While the Federal Rules of Evidence are not directly applicable to our administrative proceedings, we often look to those rules for guidance. See generally Duke Power Co. (William B. McGuire Nuclear Station, Units 1 and 2), ALAB-669, 15 NRC 453, 475 (1982).

applicants had made and was a true and correct copy of their submission to the Commission. Tr. 710-11. Intervenors did not impeach this identification in any way. We find it sufficient to authenticate the FSAR.

We do differ, though, with the Licensing Board's admissibility ruling. Intervenors asked the applicants to produce witnesses who would sponsor the portions of the FSAR that concerned the seismic matters in controversy. The applicants refused, asserting that the document had gone through so many hands that no one could claim pride of authorship. Tr. 1002-03, 1007-08. The Board nevertheless admitted the FSAR into evidence in its entirety for the truth of the matters stated therein. Lack of sponsorship, the Board ruled, was relevant as to weight, not admissibility. Tr. 946-47. The Board went on, however, to caution that it did not anticipate resolving any major issues by reliance on unsponsored portions of the FSAR. Tr. 947. As we have seen (note 31, supra), the Board was true to its word.

It is certainly correct, as the Board recognized, that there is usually no bar to the admissibility of hearsay evidence in our administrative proceedings. Duke Power Co. (Catawba Nuclear Station, Units 1 and 2), ALAB-355, 4 NRC 397, 411-12 (1976). Whether evidence is or is not hearsay is significant only insofar as it bears on the question of

its reliability.^{33/} Here, the Board found that the circumstances surrounding preparation and filing of the FSAR -- "not the least of which is that [it is] filed under an obligation on the part of the person preparing it to tell the truth" -- imbues the document with a trustworthiness and reliability that "far exceeds many of the historic exceptions to the hearsay rule." Tr. 947.

The FSAR is the applicants' principal safety submission in support of an operating license for its plant. While the factors outlined by the Board go far toward assuring the factual accuracy of the FSAR, the controversial portions of the document are likely to be the judgmental opinions and conclusions of experts -- opinions and conclusions about which reasonable persons may differ. The difficulty we have with the Licensing Board's ruling is that it denies intervenors an opportunity to conduct cross-examination on those sorts of judgments and the factual bases for them, at least insofar as they are reflected in the FSAR.^{34/} That

^{33/} "[O]nly relevant, material, and reliable evidence which is not unduly repetitious will be admitted" in a NRC licensing proceeding. 10 CFR § 2.743(c).

^{34/} Intervenors did, of course, have an opportunity to cross-examine the bevy of expert witnesses applicants presented on seismic issues. Indeed, it was for this reason that the Board was not obliged to rely heavily on the FSAR for its findings of fact.

ruling strikes us as erroneous.

In our judgment, while the FSAR may be conditionally admissible into evidence on the basis of the indicia of trustworthiness outlined by the Licensing Board, once portions of the FSAR pertinent to the contentions in the proceeding are put into controversy, the applicants must present a competent witness to defend them. We see no basis for allowing applicants to avoid cross-examination on a document of central importance that they themselves prepared. The witness need not be the author or authors of the sections in controversy. It may well be difficult to parse through an institutional document such as the FSAR, prepared over the course of years, to identify specific authors. But the applicants are obliged to put forward one or many witnesses, of the applicants own choosing, who are competent to testify about those aspects of the FSAR that are in controversy. Failing that, the controverted portions of the FSAR lose what reliability they had. They should be given no weight, and excluded as substantive evidence.^{35/}

We reached a similar conclusion in Duke Power Co. (William B. McGuire Station, Units 1 and 2), ALAB-669, 15 NRC 453, 477 (1982). In upholding the exclusion of

^{35/} The FSAR is, of course, admissible in its entirety to evidence compliance with NRC regulations that require its preparation. See note 30, supra.

unsponsored technical analyses, we said that that kind of material

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.

See also Cleveland Electric Illuminating Co. (Perry Nuclear Power Plant, Units 1 and 2), ALAB-443, 6 NRC 741, 754-56 (1977). Our refusal to accept the reports of the Advisory Committee on Reactor Safeguards (ACRS) as substantive evidence on controverted issues rests on the same basis.^{36/} In Arkansas Power and Light Co. (Arkansas Nuclear One Unit 2), ALAB-94, 6 AEC 25, 32 (1973) (footnote omitted), we explained that

the contents of an ACRS report cannot, of themselves, serve as an underpinning for findings on the health and safety aspects of licensing proceedings. It is quite true that Section 182b of the Atomic Energy Act, 42 U.S.C. 2232(b), and a regulation of the Commission, 10 CFR 2.102, require both that the ACRS render a report on every docketed application for a construction permit or operating license and that the report be made a part of the record. But, since the persons responsible for the report (the members of the ACRS) are not subject to being examined by the parties or the Board with reference to its contents, the report cannot be treated as having been admitted into evidence for the truth of any of the statements therein. Rather, its introduction into the record must be deemed to be

^{36/} A licensing board may rely upon the conclusions of the ACRS on issues that are not controverted by any party. 10 CFR Part 2, Appendix A, § V(f)(1), (2).

for the limited purpose of establishing compliance with the requirements of the statute. See [Wisconsin Electric Power Co. (Point Beach Nuclear Plant, Unit 2), ALAB-78, 5 AEC 319 (1972)]. This being so, the report may not be assigned any independent probative value.

See also Consumers Power Co. (Midland Plant, Units 1 and 2), ALAB-123, 6 AEC 331, 340 (1973).

The decisions in Boston Edison Co. (Pilgrim Nuclear Power Station), ALAB-83, 5 AEC 354 (1972), aff'd sub nom. Union of Concerned Scientists v. AEC, 499 F.2d 1069 (D.C. Cir. 1974), relied upon by the applicants and the staff, are not to the contrary. True enough, in Pilgrim we said with regard to the FSAR that

The admissibility . . . into the hearing record need be tested only by its identification as the document prepared pursuant to Commission regulations and submitted to the Commission as a part of the application. So long as the FSAR meets such an identification test it is admissible.^{37/}

Id. at 369. But our statement in Pilgrim was made in the context of a Commission regulation, no longer in effect, that required that the entire license application (of which the FSAR is a part) be offered into evidence. 10 CFR

^{37/} We also noted that "[t]he weight which should be given to the contents of the FSAR is another matter which depends on the evidentiary record which is developed in connection with specific matters in controversy." 5 AEC at 369.

§ 2.743(g) (1962).^{38/} Moreover, in the Pilgrim proceeding, a witness clearly identified himself as responsible for the contents of the FSAR, and applicants offered that witness for questioning on the sole issue in contest, including apparently the contents of the FSAR. See 5 AEC at 369.

The District of Columbia Circuit affirmed that ruling. The court noted that the evidentiary issue hinged on the reliability of the FSAR, and that could not be decided "prior to at least conditional admission in a proceeding in which reliability is the ultimate issue". Union of Concerned Scientists v. AEC, supra, 499 F.2d at 1094. Our ruling here, which allows the FSAR, when properly identified, to be conditionally admitted pending the sponsorship and defense on cross-examination of its controverted portions, is wholly consistent with those

^{38/} Section 2.743(g) in its present form provides that the NRC staff shall offer in evidence in any proceeding involving an application the pertinent ACRS report, the SER, and any environmental impact statements. The record of the license application is no longer required to be offered in evidence. See 37 Fed. Reg. 15127, 15134 (July 28, 1972).

decisions.^{39/} In sum, the Licensing Board's ruling admitting the FSAR in its entirety was error, but the error was harmless in view of the limited reliance the Board placed upon it. See note 31, supra.

II

The second set of issues on appeal relates to the adequacy of the emergency planning for a nuclear accident at San Onofre. Our stay decision principally discussed whether (1) the applicants' warning system to notify the public of a nuclear accident was adequate in light of the absence of siren coverage for the populated areas across San Juan Creek, (2) the emergency response plan must include provision for medical arrangements for members of the general public who might suffer radiation injury in a

^{39/} Judicial decisions have also recognized the need for a sponsoring witness to support the introduction of material that contains experts' studies and opinions. See generally Forward Communications Corp. v. United States, 608 F.2d 485, 509-10 (Ct. Cl. 1979) (per curiam) (Fed. R. Evid. 803(6) hearsay exception for business records does not allow admission of appraisal report without a witness to sponsor its admission); Carter-Wallace, Inc. v. Gardner, 417 F.2d 1086, 1096 (4th Cir. 1969), cert. denied sub nom. Carter-Wallace, Inc. v. Finch, 398 U.S. 938 (1970) (hearing examiner properly excluded unpublished scientific paper where the party offering the document did not call its author to sponsor its admission but sought instead to introduce it through testimony of the company vice-president).

serious nuclear accident,^{40/} and (3) offsite jurisdictions had the ability to monitor and assess radiological emergencies. See ALAB-680, supra, 16 NRC at ___ (slip opinion at 2).

A. Siren Coverage

In our stay decision we rejected intervenors' attack on the Licensing Board's conclusion that the absence of siren coverage for the populated areas across San Juan Creek was not a ground for denying applicants a license for full power operation. The Board found, and we agreed, that alternative means (such as loudspeakers from helicopters and police cars) exist to provide a prompt alert to this segment of the public in the event of an emergency. The Board imposed a license condition requiring the siren deficiency to be remedied within six months of operation. Thus, we found reasonable assurance that "adequate interim compensating actions have been or will be taken" for the temporary gap in siren coverage. 10 CFR § 50.47(c)(1). See ALAB-680, supra, 16 NRC at ___ (slip opinion at 7-13).

On appeal, intervenors renew their argument that alternative measures to sirens do not assure prompt public notification. Our stay decision canvassed the issue fully.

^{40/} We do not address this issue here because the Commission has taken review of it. See CLI-82-27, 16 NRC ___ (Sept. 24, 1982).

ALAB-680, supra, 16 NRC at ___ (slip opinion at 7-13). The evidence demonstrated that the affected population would be notified within thirty minutes of an alert through a combination of emergency vehicles, helicopters, and existing siren coverage. Tr. 9003-05, 9021-22. That kind of coverage comports with the outer limit of about forty-five minutes that is contemplated in the Commission's regulatory scheme governing public notification. See 10 CFR Part 50, Appendix E, § IV.D.3; 10 CFR § 50.47(b)(5); NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Rev. 1 (November 1980), Appendix 3 at 3-3 [NUREG-0654]. We are satisfied that the record fully supports the Board's decision. See ALAB-680, supra, 16 NRC at ___ (slip opinion at 9-10).

B. Radiation Monitoring

1. Plume emergency planning zone.

Intervenors argue that full power operation must await upgraded radiation assessment and monitoring capabilities on the part of local jurisdictions. We set out the background of this issue in our stay decision (ALAB-680, supra, 16 NRC at ___ (slip opinion at 22-23) (footnote omitted):

The governing regulation, 10 CFR 50.47(b)(9), requires the applicants and local jurisdictions to have "[a]dequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency" The Licensing Board explained the importance of this requirement in its decision [LBP-82-39, supra, 15 NRC at 1201]:

Should there be an actual or potential radiological release from San Onofre, the nature and magnitude of the release and the prevailing meteorological conditions must be established and kept current so that potential offsite doses can be projected. Such projections give decision-makers in the offsite response organizations the information they need to make correct decisions concerning the appropriate protective action -- sheltering or evacuation. Field monitoring confirms the accuracy of offsite dose projections made on the basis of onsite data.

The Licensing Board found that the cities and counties near San Onofre possessed somewhat deficient but nonetheless substantial monitoring and assessment capabilities. Given the applicants' more than adequate capabilities in that regard, however, the Board concluded that the deficiencies of the local jurisdictions were not significant. LBP-82-39, supra, 15 NRC at 1202.

In their merits brief, intervenors argue that the applicants meet only the minimum staffing requirements suggested by controlling NRC guidance for offsite monitoring capability, i.e., applicants can put only four health physics technicians in the field within the first hour.^{41/} They argue that as a matter of law, that capability cannot

^{41/} NUREG-0654, supra, at 37, calls upon nuclear power plant operators to have two persons available, within 30 minutes of declaring an emergency, for the purpose of conducting offsite radiological assessment and monitoring surveys. Another two people are to be available within another half hour.

(FOOTNOTE CONTINUED ON NEXT PAGE)

compensate for the deficiencies in preparedness by the surrounding jurisdictions. Intervenors' Brief on Emergency Planning (June 29, 1982) at 13-15. We are unpersuaded.

First, as our stay decision makes clear, the record shows that the local jurisdictions have a considerable and continually improving capability for radiation monitoring and for relaying that data to the Offsite Dose Assessment Center. Each of the surrounding jurisdictions -- Orange County, the City of San Clemente, San Diego County, and Camp Pendleton -- has the capability to send equipped and trained monitoring teams into the field. ALAB-680, supra, 16 NRC at ___ (slip opinion at 27-28).

Second, the applicants have two independent facilities -- a Technical Support Center and an Offsite Dose Assessment Center -- at their disposal to assess potential offsite radiological consequences and to provide local officials with the information necessary for their

41/ (FOOTNOTE CONTINUED FROM PREVIOUS PAGE)

Each health physics technician will be accompanied by a maintenance worker who is to assist the technician in transporting equipment, driving the survey vehicle, and recording data. Tr. 7173-74. We do not count these maintenance workers toward meeting the minimum staff requirements of NUREG-0654 because the maintenance personnel may not be competent to perform the monitoring and assessment functions there specified.

protective action decisions. Id. at ___ (slip opinion at 25-27). Even if intervenors correctly argue that the applicants' monitoring and assessment capabilities do not fully compensate for the deficiencies of the local jurisdictions, the claimed gap is not so wide as to be a significant deficiency. See 10 § CFR 50.47(c)(1).^{42/} As it turns out, the applicants would be at such a minimum staffing level only infrequently. Indeed, the applicants will usually have ready access to a far greater number of health physics personnel and would be able to field additional monitoring teams in short order. Tr. 7173-74, 9066-71.

2. Ingestion emergency planning zone

Intervenors also argue that the Board treating as contested the issue of the adequacy of the emergency plans for radiological monitoring and assessment in the ingestion pathway emergency planning zone (ingestion EPZ). They assert that their proposed findings were sufficient to put this issue in contest. The Board termed the record on this matter "decidedly equivocal" but ruled that the issue was uncontested to be resolved informally by the staff prior

^{42/} The Licensing Board imposed a license condition requiring the applicants to maintain their monitoring and assessment capabilities at no less than the level described at the hearing. LBP-82-39, supra, 15 NRC at 1252.

to full power operation based on what the Board considered intervenors' failure to file proposed findings of fact as to this matter. LBP-82-39, supra, 15 NRC at 1209-11.

Recently in Detroit Edison Co. (Enrico Fermi Atomic Power Plant, Unit 2), ALAB-709, 17 NRC ___ (Jan. 4, 1983) we held that, absent a board order requiring the submission of proposed findings, an intervenor that does not make such a filing is free to pursue on appeal all issues it litigated below. We based our ruling on the text of 10 CFR § 2.754 which makes the filing of proposed findings of fact optional unless the presiding officer directs otherwise. The setting of a schedule for such a filing, we held, falls short of an explicit direction and thus does not form the basis for finding a party in default. Id. at ___ (slip opinion at 4-5).

Here, as in Fermi, the Licensing Board set a schedule, mutually agreed upon by the parties, for filing proposed findings but issued no direction to do so. Tr. 11,357-59. Unlike the Fermi intervenors, however, intervenors in this case did file proposed findings of fact. We think in this circumstance the Board was entitled to take that filing as setting forth all of the issues that were in contest. There is no good reason why a party should pick and choose among issues it contests, proposing findings as to some but not

others.^{43/} Having reviewed the proposed findings that intervenors did file, we conclude that the Licensing Board was correct in ruling that the ingestion EPZ issue was not raised below, and was appropriately left to the staff for resolution.^{44/}

As an independent matter, we are also of the view that the deficiencies in emergency planning for the ingestion EPZ are not significant. Our stay decision noted that (ALAB-680, supra, 16 NRC at ___ (slip opinion at 30)):

The Board's hesitancy on the question of adequacy stemmed from the fact that the lead role in emergency planning and implementation for the

^{43/} Indeed, intervenors here do not claim otherwise. Moreover, a different result would open up the possibility that a licensing board would be misled into not directing the filing of proposed findings because it had already received what it thought were the complete proposed findings of a party.

While this possibility could be obviated by a licensing board direction at the close of the evidentiary hearing to require the submission of proposed findings, (and we think that would be the better practice) we are reluctant to place that obligation on the licensing boards.

^{44/} The findings on which intervenors rely pertain to contention 2H which concerns radiation monitoring and dose assessment in the plume EPZ, not the ingestion EPZ. See Intervenors' Proposed Findings of Fact and Conclusions of Law on Emergency Planning and Preparedness Issues (Nov. 24, 1981) at 38-49.

ingestion EPZ is given to the State. While the applicants had "done about all that might reasonably be expected of them in this area," the Board found that the State plan was still evolving [footnote omitted].

We then reviewed the planning that had thus far been accomplished (id. at ___ n.22 (slip opinion at 30 n.22)):

Applicants submitted an extensive study of potential radiological hazards in the ingestion pathway EPZ in the event of a serious accident, a study that included suggested protective response levels for food, milk, and water. Applicants' Exhibit 121. They also presented an emergency response plan for the ingestion pathway. Applicants' Exhibit 143. The latter document was reviewed by the State Health Department and was found to be "excellent, generally well organized, concise and consistent with the RHS [Radiological Health Services] planning procedures document." Applicants' Exhibit 159. See also Tr. 7388-89. Mr. David F. Pilmer, for the applicant, testified that the State had prepared a draft emergency plan for the ingestion pathway, which assigns responsibilities to the local jurisdictions and designates the States's supporting role. Tr. 11,115. He also indicated that the applicants' plan would guide the ODAC [offsite dose assessment center] personnel in selecting appropriate pathway samples and evaluating them. Tr. 11,123. The Orange County Emergency plan includes provisions for taking samples of water and foodstuffs, and the County has an agreement with the University of California at Irvine to analyze such samples. Tr. 8982-83.

In short, the applicants have largely accomplished all that can be accomplished in advance. They have identified the critical pathways by which radioactive materials from the plume could be incorporated into foodstuffs and the water supply, and set suggested protective action levels. Further, they have formulated an emergency response plan

that entails defining the area of possible contamination, determining, by field monitoring, the nature and extent of the contamination, and calculating the dose commitment results. Ibid. See also Tr. 11,123-26. It is the State of California which is to complete its planning in this regard, and we urge it to do so.

The deficiencies that remain in State planning are not significant in light of the applicants' efforts, and the comparatively less extensive planning that is required and possible for the ingestion EPZ. Unlike the much smaller plume EPZ where evacuation or sheltering from the plume may be a matter of immediacy, protective action in the 50-mile radius ingestion EPZ need not be as immediate. Contamination would be traceable to ingestion, not to external radiation exposure, and the conservative response of a broad-scale foodstuffs quarantine or disposal is always available. Moreover, the kinds of ingestion EPZ protective action that would be suggested -- such as quarantining or disposing of certain foodstuffs in designated areas -- are highly site and accident specific: hence, they are less amenable to planning in advance of an accident than the comparable responses of sheltering or evacuation that are appropriate for the plume EPZ. In sum, even if intervenors had properly preserved their argument on the ingestion EPZ, we would still be of the view that deficiencies that exist in emergency planning for this area are not significant.

C. Special Populations

Much of intervenors' brief is devoted to a question not raised in their stay papers -- whether adequate emergency plans are in place to assure protective action on behalf of special segments of the "at risk" population. 10 CFR § 50.47(b)(10) requires the development of a range of protective actions to protect the public in the plume EPZ, and implementing guidance specifies that this should include "[m]eans for protecting those persons whose mobility may be impaired" NUREG-0654, supra, at 61. We think that the transportation arrangements for the elderly, the handicapped, and school children are in need of improvement, and so condition the operating licenses in this case.

1. The Elderly and Disabled

If evacuation is to be a possible course of action in a nuclear emergency, those persons in need of transportation must know who to call for assistance or, better still, be identified in advance. ^{45/} The San Onofre emergency plans provide for public transportation to be available at central

^{45/} The Commission's emergency planning guidance calls upon licensees, States, and local jurisdictions to disseminate, at least annually, information regarding how the public will be notified and what its actions should be in the event of an emergency. The information is to address, among other things, the "special needs of the handicapped" and is to indicate how to effect "protective measures, e.g., evacuation routes and relocation centers [and] sheltering." NUREG-0654, supra, at 49.

locations. Tr. 7292-93. However, for housebound individuals, i.e. those who are unable to reach the central locations, other arrangements, such as door-to-door pickup, have to be made.

The applicants have attempted to fulfill that responsibility by a variety of means, including the mailing of an information packet to all people within the emergency planning zone with a request that those in need of special assistance return an enclosed postcard. Tr. 7040-51. However, according to Marilyn Ditty, Executive Director of San Clemente Seniors, only about half of the people in the area who are housebound returned the postcard. Tr. 9838-43. See also Tr. 8576-79. Although Ms. Ditty could not provide a precise estimate of the number of elderly persons who would need special assistance, perhaps as many as another 500 people remain to be identified. ^{46/}

There is a willingness among all groups -- applicants, service organizations, and city officials -- to cooperate in that identification effort. Tr. 8641, 9861-62, 10,093-94. Indeed, that willingness may already have led to further efforts. See Tr. 8579. Nevertheless, we think it best if

^{46/} Ms. Ditty thought about 1,100 senior people would need door-to-door assistance. Tr. 9864. Earlier testimony indicated that about 600 assistance requests had been received. Tr. 8578.

the matter is formalized through a license condition requiring applicants to work with city officials and private service groups, such as San Clemente Seniors, to continue to identify housebound people who would need transportation assistance in the event that a nuclear accident at San Onofre occasioned the need for evacuation. Once identified, adequate transportation will be arranged. See Tr. 7292-93, 8908. See also p. , infra.

We leave to the applicants to decide what form the further and continuing identification procedure should take -- whether, for example, they should undertake a second mailing or telephone survey utilizing lists compiled by groups such as San Clemente Seniors, and/or place further newspaper advertisements. In any case, the objective should be to assemble and keep current as reasonably complete a list as possible of housebound people within the plume EPZ who would require transportation assistance in an evacuation. One-hundred-twenty days should be time enough in which to undertake that effort.^{47/}

^{47/} We do not impose this requirement as a condition precedent to full-power operation. The Commission has generally provided at least 120 days to remedy emergency planning deficiencies more pervasive than this, especially where (as here) the applicants have made a concerted effort to fulfill their responsibilities and the necessary remedial measures are straightforward. See Consolidated Edison Co. of New York (Indian Point Units 2 and 3), CLI-82-38, 16 NRC (Dec. 23, 1982) (slip opinion at 7-9).

2. School children and others requiring bus transportation.

Conservatively estimated, approximately 200 buses would be needed to transport school children if an evacuation is ordered while school is in session, and another 200 buses needed for people not having access to a private automobile at the time of an evacuation. Tr. 7294-95; Applicants' Exh. 132 at 24-25, 27-28. See generally Applicants' Exh. 132 at 21-32.^{48/} These resources are available.

Buses from the Orange County Transit District (OCTD) and the Capistrano Unified School District (CUSD) constitute the primary source of assistance. During normal working hours on weekdays the Orange County Transit District can provide about 125 buses for immediate response. Applicants' Exh. 59 at X-9.^{49/} Some 200 additional buses in Irvine, just outside the emergency planning zone, could be available in about forty-five minutes. Tr. 7295, 8907. Another 200 buses are available at OCTD's Garden Grove facility, and the

^{48/} Approximately 12,000 students are enrolled in schools within the emergency planning zone. Buses of the Capistrano Unified School District and the Orange County Transit District can seat, on the average, 45 adults or 67 children. Applicants' Exh. 132 at 27-28. See also Applicants' Exh. 140 at 3-5; Tr. 8813.

^{49/} At all other times 75 buses can be provided on a two-hour response basis. Applicants' Exh. 59 at X-9.

Capistrano Unified School District has approximately fifty-five buses on hand. Tr. 7295, 8802-05.

All of OCTD's buses are equipped with two-way radios capable of being used both to receive emergency instructions and to request emergency information from the dispatcher if necessary. Tr. 9909-10, 9913-14. OCTD also maintains a list of the home telephone numbers of its 800 drivers. Tr. 9913-15. Finally, emergency procedures are in place to notify senior transit and school officials in the event of an accident at San Onofre. See Applicants' Exh. 53, Attachment 2; Applicants' Exh. 140; Tr. 7296-97.

Although the resources at hand are plentiful, and some procedures for their use are extant, there are yet deficiencies in need of correction. Jan Goodwin, General Chairman, United Transportation Union, Local 19, the managing union official for OCTD bus drivers, explained that there have been no training sessions for drivers geared toward alerting them to the problems they might confront in a radiological emergency. For example, the drivers have not been instructed what the effects of radiation are, how to measure radiation dose, whether dosimeters will be available for them, how to deal with frightened passengers, and how to locate, absent street maps, specific pick-up points outside their normal service area. Tr. 9900-06. See also Tr. 9888-91. While many of these questions may seem prosaic, and might be handled effectively in an actual

emergency through the two-way radio system with which the buses are equipped, nevertheless in our judgment a training program for bus drivers would greatly smooth the emergency response.

The Licensing Board put it well, albeit in a different context:

It is axiomatic that specific training should be required for persons expected to assist in a radiological emergency; that it should be tailored to the level of expertise expected in each area of responsibility; and that it should be effective.^{50/}

LBP-82-39, supra, 15 NRC at 1206. Bus drivers are not ordinarily considered emergency workers, but they have extensive responsibilities in the event of a nuclear accident at San Onofre. Unlike police or firefighters, the OCTD bus drivers probably have received little general emergency training, and have received none relating specifically to a nuclear emergency.^{51/} Consequently we impose a license condition requiring that a training program for OCTD bus drivers be formulated and instituted within

^{50/} See generally 10 CFR Part 50, Appendix E, §IV.F ("a radiological orientation training program shall be made available to local services personnel").

^{51/} The CUSD drivers, by comparison, have monthly safety meetings which include information pertinent to their responsibilities in a nuclear accident. Tr. 8837-38.

the next 120 days.^{52/}

3. Other Special Populations

Intervenors argue that certain aspects of the emergency response plans are inadequate for (1) boaters, and (2) persons in Riverside County and San Juan Capistrano. We find no merit in these claims.

(a) Boaters

The United States Coast Guard is responsible for clearing the offshore area within a 10-mile radius of San Onofre. Applicants' Exh. 59 at IV-9; Tr. 9212-13. In the event of a nuclear accident, the Coast Guard in San Diego would be notified promptly and send a radio alert on marine channels to boaters. Additionally, a Coast Guard helicopter could be on the scene within about 15 to 30 minutes. Tr. 9211-15. Closer helicopters from Camp Pendleton and Orange County, as well as a thirty-foot rescue boat maintained by the State Parks Department at nearby Doheny Beach could also be available. See Tr. 8271-72, 8533-34, 8557-59, 9342. The

^{52/} We think this additional requirement will facilitate the emergency response. It need not, however, be fulfilled as a precedent to full-power operation. As we discussed earlier (see pp. __, supra) we are satisfied that there are sufficient resources to provide reasonable assurance that an adequate emergency response capability exists for San Onofre. The number of buses and drivers is sufficient to cope with an emergency and an effective radio communication system is in place. Additionally, training is in place for the CUSD drivers. At issue is the efficiency, rather than the very availability, of the response.

Licensing Board was plainly correct in finding that, these measures collectively provide reasonable assurance that boaters in the emergency planning zone will be promptly notified and instructed in the event of a nuclear accident at San Onofre. See LBP-82-39, supra, 15 NRC at 1268-71; 10 CFR § 50.47(b)(5).

(b) Riverside County

Intervenors argue that officials of Riverside County should have been consulted before a decision was made whether or not to include the County in the plume EPZ. 10 CFR § 50.47(c)(2) provides that:

Generally, the plume exposure pathway EPZ for nuclear power plants shall consist of an area about 10 miles (16 km) in radius The exact size of the EPZs surrounding a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries.

The regulation, by its terms, does not impose the consulting requirement for which intervenors argue and we decline their invitation to read one into it. The pertinent inquiry is whether the plume EPZ was properly drawn after a consideration of the factors specified in 10 CFR § 50.47(c)(2). Here, the Licensing Board found that the applicants excluded Riverside County from the plume EPZ because only a very small segment of that County (less than one-half square mile) lies within ten miles of the reactors:

and that small segment is remote and uninhabited. LBP-82-39, supra, 15 NRC at 1224-25. See Tr. 7277, 7370, 8129-30. The absence of need for local emergency response fully justifies the exclusion of Riverside County from the plume EPZ.^{53/}

(c) San Juan Capistrano

Intervenors assert that the Licensing Board erred in not finding that the City of San Juan Capistrano (which contains about one-half the population of the plume EPZ) was a "principal response organization," that must fulfill detailed emergency planning requirements. See 10 CFR § 50.47(b). We disagree.

A principal response organization is one that has a "major or lead role[] in emergency planning and preparedness." NUREG-0654, supra, Appendix 5 at 5-1 (emphasis in original). The Commission's guidance recognizes that in any emergency planning zone there will be overlapping layers of government, and that these must be integrated into a cohesive emergency response. It suggests inter alia, that townships and municipalities by mutual agreement integrate their resources into an overall county or multi-county emergency response plan. Id. at 19-22.

^{53/} The portion of Riverside County that is within 50 miles of San Onofre is, of course, included in the ingestion EPZ. See generally Tr. 7343-52; Applicants' Exh. 121. The State of California is responsible for developing the emergency plan for that EPZ. 10 CFR § 50.33(g).

That is what has been done here. The City of San Juan Capistrano does not itself have extensive resources that would be of use in an emergency. Consequently, it has contracted with Orange County to provide the fire, law enforcement, transportation, and monitoring services it needs. Tr. 8689-90, 8691-92, 8694-95. The City has been an active participant in the regional planning of an emergency evacuation, has worked with other government agencies to develop procedures for coordinated emergency response actions, and has integrated its own emergency plan into the overall Orange County plan. Applicants' Exh. 134; Tr. 8685-92. By these efforts the city has assured that it will have available to it mutual assistance around the clock. Tr. 8691-92. These arrangements are fully consonant with the Commission's regulations and guidance. It would be highly unusual for a governmental entity, bereft of extensive resources of its own, to be required to take a lead role in planning the response to a radiological emergency.

D. Procedural Objections

Lastly, intervenors object on a number of grounds to the testimony of the Federal Emergency Management Agency (FEMA). FEMA is the lead agency responsible for evaluating whether State and local emergency plans are adequate and capable of being implemented. Its finding in that regard is entitled to a rebuttable presumption in Commission licensing

proceedings. 10 CFR § 50.47(a)(2). See generally FEMA/NRC Memorandum of Understanding, 45 Fed. Reg. 82713 (Dec. 16, 1980).

In this case FEMA issued "interim" findings on June 3, 1981 which were critical in various respects of the state of offsite preparedness at San Onofre. See LBP-82-39, supra, 15 NRC at 1212-13. The applicants sought to have the cited deficiencies corrected. To this end they met with local county and city officials, discussed with members of FEMA's West Coast regional office which criticisms FEMA considered most significant, and developed a set of proposals aimed at correcting the deficiencies. See Applicants' Exhs. 144, 146. Intervenors claim that those discussions between FEMA and the applicants violate the Commission's ex parte rule and denied them a fair hearing.

1. Ex parte discussions

This argument need not detain us long. As we said in our stay decision:

[N]othing in the Commission's ex parte rule (10 CFR 2.780) precludes conversations among parties, none of whom is a decisionmaker in the licensing proceeding. We doubt intervenors will persuade us in the pending appeal that it was improper for FEMA, the applicants, and the staff to confer about defects in the applicants' emergency plan and to suggest ways to correct them.

ALAB-680, supra, 16 NRC at ___ (slip opinion at 34). The fact that a final FEMA finding is entitled to a rebuttable presumption does not convert that agency into a decisionmaker in Commission licensing proceedings. The

adjudicatory boards and the Commission are the decision-makers, not FEMA.

2. Other Asserted Defects

Intervenors allege further defects involving FEMA's testimony at the hearing: (1) that Kenneth Nauman, the regional FEMA analyst on the San Onofre emergency plans, was permitted to give testimony that contradicted the FEMA interim findings;^{54/} and (2) that the evaluation (included in Mr. Nauman's presentation) of applicants proposed corrective actions by the FEMA national office was admitted into evidence without a proper sponsoring witness. Intervenors argue these errors were prejudicial because the Board relied on Mr. Nauman's testimony to conclude that the needed corrective actions for offsite emergency preparedness were straightforward and would be satisfactory to FEMA when accomplished. See LBP-82-39, supra, 15 NRC at 1213-16.

(a) FEMA Interim Findings

We are unpersuaded that Mr. Nauman was not entitled to contradict or expand upon the FEMA interim findings. This is so for three reasons. First, FEMA counsel represented that Mr. Nauman's direct testimony -- testimony that reviewed and evaluated the corrective actions that the applicants then had underway -- had been reviewed and

^{54/} Mr. Nauman was the principal author of the interim findings.

approved by the national office. Tr. 10,399-10,400, 10,444. Thus, there is no inconsistency between the position of FEMA's regional office (for whom Mr. Nauman spoke) and the views of the national office. Second, Mr. Nauman testified to activities that had been taken place following the issuance of the interim findings. Accordingly, his statements would not conflict with those findings. In essence, intervenors' position would "freeze" FEMA's contributions to the evidentiary record on emergency planning at the point of the FEMA interim findings, and would ignore evidence of any subsequent corrective actions until FEMA issued its "final" finding. As we explain below, this argument is inconsistent with the role of FEMA in Commission licensing proceedings and leads us to our third and most fundamental reason for rejecting intervenors' argument.

Intervenors' limiting view of the evidentiary record is at odds with the FEMA/NRC Memorandum of Understanding and a recent amendment to the Commission's emergency planning regulations. The Memorandum recognizes the distinct possibility that a final FEMA finding may not always be available in a timeframe compatible with the schedule of Commission licensing proceedings. It therefore provides that FEMA will offer its preliminary views on the state of offsite emergency preparedness "based upon plans currently available to FEMA." 45 Fed. Reg. at 82714 (emphasis added).

The Memorandum states further that to support its findings and determinations, "FEMA will make expert witnesses available before . . . NRC hearing boards and administrative law judges." Ibid. The clear import of the Memorandum is that FEMA will provide Commission licensing proceedings, through FEMA witnesses, the benefit of its most current evaluation of State and local emergency planning. There is no hint of "freezing" either FEMA or the licensing proceeding to earlier and likely outmoded information.

A recent amendment to the Commission's emergency planning regulations further supports this understanding. As revised, 10 CFR § 50.47(a)(2) provides that emergency preparedness exercises are not required for a nuclear power plant operating license decision. Rather, the exercises "are part of the preoperational inspection and thus [are] required prior to operation above 5% of rated power, but not for a Licensing Board, Appeal Board, or Commission licensing decision." 47 Fed. Reg. 30232 (July 13, 1982). See also id. at 30233.^{55/} In contrast, FEMA will not issue its final finding on the adequacy of offsite preparedness until after State and local emergency planning exercises have been

^{55/} A petition for review of the amended rule has been filed. Union of Concerned Scientists v. NRC, No. 82-2053 (D.C. Cir. No. 82-2053) (filed Sept. 10, 1982).

held.^{56/} It thus seems plain that the Commission expects licensing decisions on emergency preparedness to be made on the basis of the best available current information, and not deferred to await FEMA's last word on the matter.^{57/}

^{56/} FEMA's proposed rules regarding its approval of offsite emergency plans require the prior holding of a complete exercise of those plans. 45 Fed. Reg. 42341, 42345 (June 24, 1980). These rules reflect FEMA's current practice.

^{57/} There are, to be sure, both substantive and procedural limits as to how much of the emergency preparedness evaluation, or how many open items, may be deferred until after the close of the hearing. Substantively, the evidence must be sufficient for the Board to conclude that the state of emergency preparedness "provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency." 10 CFR § 50.47(a)(1). The Commission has stressed that this conclusion may be a predictive one, rather than a reflection of the actual state of emergency preparedness at the time of the board's decision. 47 Fed. Reg. at 30233. Moreover, as the Licensing Board points out (LBP-82-39, supra, 15 NRC at 1216), the Commission

has long . . . recognized in other areas of reactor regulation that not all matters have to be definitively resolved on the hearing record. Certain matters may be "left for the Staff to resolve following the hearings." (Consolidated Edison Co. of New York (Indian Point Station, Unit 2), 7 AEC 947, 951-52 (1974)). These matters typically are of a minor nature and/or are such that on-the-record procedures, including cross-examination, would be unlikely to affect the result.

(FOOTNOTE CONTINUED ON NEXT PAGE)

(b) Un-sponsored Expert Opinion

Finally, we agree with intervenors that the Board erred in admitting into evidence the FEMA national office evaluation of the corrective actions then underway. Our analysis is much the same as that we applied to the admissibility of the FSAR, albeit the two documents vastly differ in magnitude. See pp. __, supra.^{58/} The evaluation

57/ (FOOTNOTE CONTINUED FROM PREVIOUS PAGE)

Procedurally, the limits are established by Section 189 of the Atomic Energy Act, as amended, 42 U.S.C. § 2239, which entitles interested persons to an adjudicatory hearing on the issuance of a construction permit or operating license. This means that an intervenor must have the opportunity to litigate the substantive question whether there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. The Commission, may, of course, condition the exercise of that right upon the meeting of reasonable procedural requirements. See p. __ supra.

58/ The FSAR is more than 30 volumes. The FEMA national view at issue here, presented through the prepared testimony of Mr. Nauman, reads in full as follows:

Q. Are you familiar with the current National Office Views of the Federal Emergency Management Administration as to the adequacy as to the offsite Emergency response planning at SONGS II and III?

A. Yes.

Q. What is that view?

(FOOTNOTE CONTINUED ON NEXT PAGE)

by the FEMA national office is essentially a conclusory expert opinion concerning the state of offsite emergency planning as of September 24, 1981, and the ease of implementing the needed corrective actions.^{59/} But FEMA witness Nauman, through whose testimony the FEMA national

58/ (FOOTNOTE CONTINUED FROM PREVIOUS PAGE)

A. Given the commitment of Southern California Edison and local jurisdictions to the correction of the deficiencies noted in the FEMA interim findings of June 3rd, 1981, and their continuing efforts to correct these deficiencies, it is believed that, provided the needed corrective actions are completed, there is a reasonable assurance adequate protective measures can and will be taken in the event of a radiological emergency at SONGS II and III.

Additional Testimony of Kenneth Nauman, Jr. (September 24, 1981), fol. Tr. 10,420.

59/ As the Licensing Board noted, the testimony is rather ambiguous. We agree with the Licensing Board's interpretation of it (LBP-82-39, supra, 15 NRC at 1215-16 (footnote omitted)):

Read literally, it is tautological: all it really seems to say is that FEMA will find the plans to be adequate, if and when the plans are adequate. But we reject this reading of the testimony because it would then serve no useful purpose. In the light of Mr. Nauman's testimony as a whole, we read the quoted testimony as a "bottom line" determination that FEMA is satisfied with the adequacy of emergency planning for San Onofre, subject only to the completion of the previously agreed upon corrective action items. Implicit in this interpretation is a FEMA judgment that the corrective action items are fairly simple and straightforward, not likely subjects of debate. Otherwise, FEMA presumably could not render a favorable opinion in advance.

view was elicited, considered himself incompetent to speak to any questions regarding those national views. His authority, he indicated, ended at the regional level. Tr. 10,437-38. Thus, just as with the FSAR, the Board admitted expert opinion into evidence despite the proponent's refusal to stand cross-examination on a document it had prepared. This was error.

The error was not prejudicial, however. Mr. Nauman, speaking for the FEMA regional office, had reached the same conclusion as to offsite preparedness as the national office and was willing to stand cross-examination on those conclusions. Tr. 10,437-38. His testimony in that capacity provides the evidentiary basis for the Board's decision on the adequacy of emergency planning.^{60/} The absence of a national imprimatur is not critical. As the Board explained (LBP-82-39, supra, 15 NRC at 1216):

This FEMA testimony points up the practical problem that confronts the San Onofre Applicants and others like them who may not have had enough

^{60/} The testimony did not rise far above the minimally adequate. Much of it was a wearisome train of circumlocution. However, it did conclude that the corrective actions then under way were straightforward and satisfactory to FEMA. Intervenors have not advanced an evidentiary basis to dispute that general conclusion, nor particularized what corrective actions are claimed to be deficient.

time to come into full compliance with the new emergency planning rule before hearings on their operating licenses. They must demonstrate to a board a "reasonable assurance" of adequacy based in part upon future actions. The Commission has recognized this problem and has addressed it in part by amending the rule to provide for full-scale emergency preparedness exercises after the hearing. (See 46 Fed. Reg. 61134, amendment to 10 CFR 50.47(a) and Appendix E.) In so doing, the Commission recognized that "the findings on emergency planning required prior to license issuance are predictive in nature and do not need to reflect the actual state of preparedness at the time the finding is made." A licensing board is to find a "reasonable assurance . . . that there are no barriers to emergency planning implementation . . .," but that consideration "can be adequately accounted for by predictive findings."

While a FEMA national review undoubtedly would lend more weight to a predictive finding of adequacy, we are unwilling to give it decisive importance. To do so would run contrary to the Commission's judgment, reflected in its recent amendment to 10 CFR § 50.47, that licensing decisions on emergency planning issues need not await the rendition of a final FEMA finding.^{61/}

^{61/} See note 57, *supra* as to the limits of this approach. Subsequent FEMA evaluations have borne out the Board's positive findings based upon the hearing record. As we said in our stay decision:

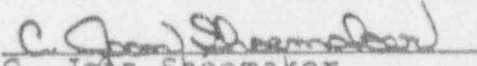
Another training exercise involving these jurisdictions was carried out on April 15, 1982 and evaluated by FEMA. Although FEMA's evaluation material is outside the record of these proceedings, no party objects to our looking at the evaluation for the specific purpose of

For the foregoing reasons, the Licensing Board's January 11 and May 14, 1982 decisions authorizing the issuance of full power operating licenses for San Onofre Nuclear Generating Station, Units 2 and 3, are affirmed, subject to the following license conditions:

1. Within 120 days applicants are to undertake further efforts to assemble and to keep current as reasonably complete a list as possible of housebound people within the plume emergency planning zone who would require transportation assistance in the event of an evacuation.
2. Within 120 days a training program is to be developed and initiated to assist Orange County Transit District bus drivers in the discharge of their responsibilities in the event of a radiological emergency at San Onofre.

It is so ORDERED.

FOR THE APPEAL BOARD


C. Jean Shoemaker
Secretary to the
Appeal Board

61/ (FOOTNOTE CONTINUED FROM PREVIOUS PAGE)

confirming that the monitoring capabilities have not deteriorated since the time of the evidentiary hearing. App. Tr. 82. They have not deteriorated. We note this summary statement found on page ii of the evaluation: "Overall, our observations concluded that all jurisdictions reflected an adequate or better capability to respond to an offsite emergency at San Onofre N.G.S."

ALAB-680, supra, 16 NRC at ___ (slip opinion at 28 n.20). See also LBP-82-39, supra, 15 NRC at 1218-19.