

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

- Nunzio J. Palladino, Chairman
- Thomas M. Roberts
- James K. Asselstine
- Frederick M. Bernthal
- Lando W. Zech, Jr.

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In the Matter of
 PACIFIC GAS AND ELECTRIC COMPANY
 (Diablo Canyon Nuclear Power Plant,
 Units 1 and 2)

Docket Nos. 50-275 OL
50-323 OL

DECISION
(CLI-84-12)

In CLI-84-4, the Commission requested the parties' responses to several questions bearing on whether the circumstances in this case warranted some specific consideration of the effects of seismic events on emergency planning. Responses were received from Pacific Gas and Electric Company (PG&E), the NRC staff, and Joint Intervenors.

After considering these responses, the Commission has determined that the information before it does not warrant departure from the decision in San Onofre that the NRC's regulations "do not require consideration of the impacts on emergency planning of earthquakes which cause or occur during an accidental release," and that the determination of whether to amend the regulations to include the consideration of earthquakes should be addressed as a generic matter. Southern California Edison Company, et al. (San Onofre Nuclear Generating Station, Units 2 and 3), CLI-83-33, 14 NRC 1091 (1981).

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Accordingly, for the reasons discussed below, the Commission has decided to initiate a rulemaking and has determined that the issuance of a full-power operating license need not be delayed until the conclusion of any such proceeding.

I.

The Commission's first question was whether emergency planning regulations can and should be read to require some review of the complicating effects of earthquakes on emergency planning for Diablo Canyon.

A. Parties' Views

PG&E and the NRC staff believe that the Commission should not read its emergency planning regulations and implementing guidance in NUREG-0654 so as to provide for any specific consideration of the complicating effects of earthquakes on emergency response, even in California. For the NRC staff, this appears to present a change from its previous view, expressed most clearly in 1981 in the San Onofre proceeding, that some limited consideration of the effects of earthquakes on emergency response was warranted in areas of high seismic activity, especially California.

PG&E's essential argument is that the Commission's emergency planning regulations implicitly include the complicating effects of earthquakes as part of the overall consideration of four classes of Emergency Action Levels established in NUREG-0654. In PG&E's view, consideration of the effects of earthquakes on emergency planning is subsumed within the consideration given to the effects of other natural

phenomena having similar effects on emergency planning. PG&E is concerned that the explicit consideration of the effects of earthquakes on emergency planning will distort or preferentially align emergency plans to concentrate on earthquake-related emergencies. Therefore, PG&E believes that it would be redundant and contrary to established planning guidance to require an emergency plan to include consideration of specific accident sequences such as those associated with earthquakes.

The essential argument of the NRC staff is that there is an acceptably low risk to public health and safety associated with not requiring emergency plans to explicitly consider the complicating effects of earthquakes. This staff position is based on its belief that contemporaneous occurrence of an earthquake and a radiologic release has too low a probability to warrant mandatory consideration.¹

Joint Intervenors take the contrary view that the NRC's regulations and implementing guidance require some consideration of the complicating effects of earthquakes on emergency response for the same reasons that the NRC staff has considered the effects of other natural phenomena on emergency plans.

¹The details of the staff's position were described in its memorandum to the Commission of January 13, 1984 which was incorporated in CLI-84-4.

B. Analysis

The Commission agrees with the NRC staff's analysis in this case. The focus of the emergency planning controversy among the parties is on the possible need to consider the contemporaneous occurrence of an earthquake and radiologic release from the plant. For the earthquakes up to and including the Safe Shutdown Earthquake (SSE), the seismic design of the plant was reviewed to render extremely small the probability that such an earthquake would result in a radiologic release.² While a radiologic release might result from an earthquake greater than the SSE, the probability of occurrence of such an earthquake is extremely low.³ In addition, as the NRC staff noted in its January 13, 1984 memorandum to the Commission on the generic subject of earthquakes and emergency planning, for those risk-dominant earthquakes which cause very severe damage to both the plant and the offsite area, emergency response would have marginal benefit because of its impairment by offsite damage.

²Indeed, Diablo Canyon has been subjected to special, unprecedented reviews of this issue.

³Joint Interveners have recently moved the Appeal Board to reopen the record on the seismic design bases for Diablo Canyon to consider new seismic information. PG&E has opposed that request. Both parties rely on conflicting expert opinions. The Commission has considered in CLI-84-13 whether this new information warrants a stay and for the reasons stated there, has concluded that the new information does not require a revision of the seismic design basis of Diablo Canyon at this time. The Commission believes that the license condition requiring PG&E to complete a seismic reevaluation of the site by 1988, as new scientific data becomes available, is the appropriate method for considering such new information.

Thus, the Commission agrees with the NRC staff's conclusion that the expenditure of additional resources to cope with seismically caused offsite damage under those circumstances is of doubtful value considering the modest benefit in overall risk reduction which could be obtained.

There remains only the possibility of a contemporaneous occurrence of both a radiologic release from the plant caused by an event other than an earthquake, and an earthquake that would complicate emergency response. NUREG-0654 does call for some consideration of site-specific adverse or emergency conditions on emergency response. In prior cases such frequently occurring natural phenomena as snow, heavy rain, and fog have been considered. With one exception, the focus has always been on frequently occurring natural phenomena.⁴ The Commission believes, based on the information provided by the parties, that earthquakes of sufficient size to disrupt emergency response at Diablo Canyon would be so infrequent that their specific consideration is not warranted.

The Commission's view that it need not give specific consideration to the complicating effects of earthquakes on emergency planning in this case is bolstered by the following consideration. Specific consideration has been given in this case to the effects of other relatively frequent natural phenomena. The evidence includes the capability of the emergency plan to respond to disruptions in communication networks and

⁴The one exception is Trojan, for which consideration has been given to the effects of volcanic eruption due to the expectation that another explosion is imminent at Mt. St. Helens.

evacuation routes as a result of fog, severe storms and heavy rain. In the extreme, these phenomena are capable of resulting in area-wide disruptions similar to some of the disruptions which may result from an earthquake. Testimony in the Diablo Canyon record indicates that adverse weather conditions such as the effect of heavy fog could increase evacuation time to approximately 10 hours. Thus, while no explicit consideration has been given to disruptions caused by earthquakes, the emergency plans do have considerable flexibility to handle the disruptions caused by various natural phenomena which occur with far greater frequency than do damaging earthquakes, and this implicitly includes some flexibility to handle disruptions by earthquakes as well.

II.

The Commission's second question was whether, even though the regulations do not require it, there are special circumstances for the purposes of 10 C.F.R. § 2.758 that would permit consideration of the effects of earthquakes on emergency planning for Diablo Canyon.

A. Parties' Views

Joint Intervenors argue that this case does present special circumstances. They rely on the proximity of the plant to the Hosgri fault, the seismic redesign of the plant to accommodate earthquake-induced ground motion which may result from an SSE on that fault, and the conclusion by the Advisory Committee on Reactor Safeguards (ACRS) that the plant is designed to less conservative criteria than would have been applied to a new plant at that site.

The NRC staff and PG&E respond that Diablo Canyon has been redesigned to take into account its proximity to the Hosgri fault, and, thus, is no different from any reactor which has been designed to accommodate its seismic environment.

B. Analysis

The Commission notes that the important safety issue for any plant located in a region potentially affected by seismic activity is not the location of the facility per se but the probable consequences of such location for the plant in question. The Commission will not license a plant unless it can make the statutorily required finding that operation of the plant will not result in undue risk to public health and safety. Necessarily, this includes a determination that the seismic design is adequate. Such a finding is not undermined by the circumstances that more conservative criteria might have been applied to a new plant. The issue is whether operation of the plant as designed will result in undue risk to public health and safety. The Commission's seismic design criteria have been fully addressed for Diablo Canyon and the Commission has determined that the seismic design of the plant presents no undue risk. ALAB-644, 13 NRC 903 (1981).

What remains is the argument that the likelihood of the simultaneous occurrence of an earthquake and a radiologic release from other causes is especially high for this site. The Commission must disagree. The resources, time, and attention devoted to seismic design in this case have been unprecedented, and the information before us does not support the conclusion that the chance of such a simultaneous occurrence is substantially greater than for numerous other nuclear plant sites.

In particular, the Commission takes note of its Appeal Board decision ALAB-644 which concluded that the record does not bear out the claim that the Diablo Canyon site is one of "high seismicity," i.e., an area having a high frequency of seismic events. This conclusion was based on record evidence by Drs. Anderson and Trifunac who plotted for the years 1950 through 1974 the known epicenters in the central California coastal region, centered around Diablo Canyon, between 33° and 37° north latitude and 119° to 123° west longitude. That plot, and the calculated low-recurrence rate of an earthquake of the magnitude assigned the operating basis earthquake (OBE), indicate that the region is at most one of moderate seismicity. Earthquakes of greater magnitude than the SSE would occur with much lower frequency than the OBE. Thus, there has been no showing by Joint Intervenors of special circumstances warranting waiver of the regulations to allow specific consideration of the effects of earthquakes on emergency planning at Diablo Canyon.

III.

The Commission finds that the information and argument presented by the parties in response to the questions posed in CLI-84-4 lead to the conclusion that there is no present need to reconsider the San Onofre decision.⁵

⁵In view of the answers to the first two questions, the third question regarding the specifics of any further consideration of the effects of earthquakes on emergency planning need not be addressed.

Nevertheless, we believe that further generic rulemaking exploring the effects of earthquakes on emergency planning could be useful. In particular, the Commission believes that it will be useful to address whether the potential for seismic impacts on emergency planning is a significant enough concern for large portions of the nation to warrant the amendment of the regulations to specifically consider those impacts. The chief focus of the rulemaking proceeding will be to obtain additional information to determine whether, in spite of current indications to the contrary, cost effective reductions in overall risk may be obtained by the explicit consideration of severe earthquakes in emergency response planning. In addition rulemaking would allow a greater spectrum of public participation in the resolution of this matter on a general, as opposed to plant-specific, basis.

We previously indicated in San Onofre that this matter would be considered on a generic basis. Some time ago the NRC staff advised us that, in its view, generic consideration was not necessary. However, we were diverted from this issue by the press of other important Commission business, and we took no action in response to that advice. In retrospect, since we disagree with the NRC staff's view, we should have acted sooner and initiated rulemaking. The need to address this issue in this case has again focused our attention on this matter. By this order we are indicating our desire to initiate rulemaking shortly, and directing the NRC staff to give priority attention to the matter.

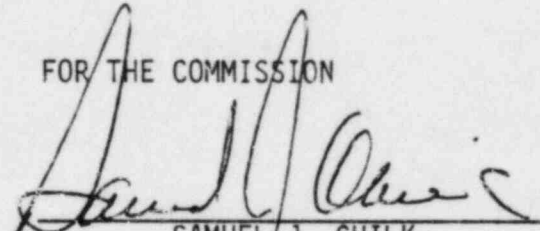
Commissioner Zech participated only in the portion of the order which concerns the initiation of a rulemaking proceeding.

The additional views of Chairman Palladino and Commissioner Bernthal and the dissenting views of Commissioner Asselstine are attached.

It is so ORDERED.



FOR THE COMMISSION


SAMUEL J. CHILK
Secretary of the Commission

Dated at Washington, D.C.

this 10th day of August, 1984

ADDITIONAL VIEWS OF
CHAIRMAN PALLADINO

I agree with the Commission's opinion. I believe that the Commission has adopted a reasonable approach to the question of earthquakes and emergency planning, one which will produce an informed Commission consideration of the policy issue, will not prejudice procedural rights, and will not pose undue risk for the health and safety of the public in the vicinity of Diablo Canyon, as well as other potentially affected plants.

Although, the question before the Commission in this case might be characterized as a question of interpretation of NRC emergency planning regulations, I view the issue as a policy question that has generic dimensions. NRC regulations simply do not address earthquakes and emergency planning. Further, at least two other plants in California (San Onofre and Rancho Seco) could be affected by the answer to the outcome of our consideration and other plants outside of California might be affected.

NRC can address a policy question by either adjudication or rulemaking. In this instance, rulemaking offers the opportunity for broader and deeper public input. I believe that the Commission could benefit from public comment on issues such as the following: what is the range of probabilities of a coincidental earthquake and radiological emergency and how does this range compare with that for other natural phenomena that could affect emergency response? To what extent does emergency

planning under current NRC regulations provide a sufficient planning base to handle the complicating effects of earthquakes? What benefits of significance for emergency preparedness would be expected to result from the consideration of the complicating effects of earthquakes? Further, if the outcome of the rulemaking is that more should be done, then the new requirements can be applied to Diablo Canyon.

It appears to me that the essential arguments in the dissenting opinion are pertinent to the policy question we will address by rulemaking, and have application to all California plants (and possibly to plants elsewhere) and not just Diablo Canyon. The assertions (and counter-assertions) of facts and their significance for the policy question can also be examined in the rulemaking and, thus, need not be accepted or argued solely on the basis of the assertions alone. All Commissioners have approved this rulemaking and I, for one, have not "already decided the issue."

Rulemaking does not assure Joint Intervenors in this case an opportunity for a formal adjudicatory hearing, but it does provide them an adequate opportunity to be heard. Further, the Joint Intervenors had no assurance of a formal hearing in the Diablo Canyon operating license proceeding. Their hearing rights depended upon their raising an issue that was cognizable in an NRC hearing. The Commission ruled in San Onofre (CLI-83-33,

14 NRC 1091 (1981)) that the matter of complicating effects of earthquakes on emergency planning could not be raised in individual cases, and it reaffirmed the San Onofre ruling in this case after providing all parties, including the Joint Intervenors, with an opportunity to submit written briefs.

While the delay on the Commission's part in addressing the generic policy question is regrettable, it would be speculative to conclude that the delay prejudiced the rights of the Joint Intervenors in the Diablo Canyon proceeding. The outcome of a more timely generic proceeding might have been a final rule that the complicating effects of earthquakes need not be considered.

Operation of the Diablo Canyon plant during the interim while the Commission conducts rulemaking does not, in my judgment, pose a significant risk to the public. The probability of an earthquake that would impede emergency response action is exceedingly small for that period of time.

COMMISSIONER BERNTHAL'S ADDITIONAL VIEWS

The Commission has been remiss in not dealing with this issue earlier, as it had indicated three years ago it would. Be that as it may, the question today is how best to proceed, in a manner that assures adequate protection of public health and safety, and is equitable and fair to the parties concerned.

My support of the Commission's order rests on a massive record compiled by the Licensing and Appeal Boards. That record includes the technical judgment of the best seismologists in this country. Their judgment is that the seismic design basis of this facility is adequate to prevent a radiological release from the most severe earthquake that could reasonably be postulated in the vicinity of Diablo Canyon. The complex basis for this conclusion is entirely consistent with the simple, factual, 200-year recorded history of seismic activity in the vicinity of the plant.

As for the probability of a random simultaneous occurrence of 1) an earthquake which could disrupt emergency planning and, 2) an accident severe enough to result in a radiological release from other causes, the comments of the parties in response to CLI-84-4 provided no basis for the notion that such an eventuality ought to be taken into account in emergency planning either generically or for Diablo Canyon specifically. My judgment in this regard is supported by the 200-year record of seismic events in the Diablo Canyon area which indicates that there have been only two events in all of that time which had the potential for any, let alone major, disruption of emergency response activities.¹

¹ Earthquake History of the United States Publication 41-1, 1982 Reprint with Supplement.

Common perceptions and "gut" feelings might seem to argue that, because a plant is located in California, it must be unique. But the numbers for actual California sites, and for the seismic design bases required of all plants to deal with their particular seismic environments, require us to move beyond subjectivity and to consider the facts. The hazards of earthquakes, tornados, hurricanes, and fogs rarely choose to conform themselves to state boundaries. The Appeal Board's conclusion, based on a careful examination of the record, that this particular EPZ area is of "low to moderate seismicity", was not casually derived, and is consistent with the 200 years of recorded seismic activity in this region of the nation.

It clearly makes sense to consider, in emergency response planning, hurricane-type events and fog conditions in California or blizzards in the northern half of the United States, since these events occur on at least an annual basis and have widespread and certain effects on road systems and other facilities which must be utilized should an emergency occur at a nuclear facility. But the actual record of seismic activity in this limited geographical area convinces me that earthquakes need not be similarly treated. From all of the information before me at the present time, I therefore find no basis to reconsider the San Onofre decision.

California has no monopoly on seismic activity. Three of the four most severe earthquakes ever recorded in the Continental United States occurred in the eastern half of the country. Further, there may be reasoned arguments which are possible, but which have not been made by the parties to the Diablo Canyon

proceeding, to support the specific consideration of seismic effects on emergency planning in the areas surrounding nuclear facilities. Therefore, out of an abundance of caution, I have agreed that the Commission should get on with the generic proceeding it committed to initiate in the San Onofre decision so that this issue may finally be laid to rest.

Dissenting Views of Commissioner Asselstine

The Commission's performance in its handling of this issue--the complicating effects of earthquakes on emergency planning--is most disappointing. In its apparent determination to avoid adjudicating an issue that the agency itself has acknowledged to be material to emergency planning, the Commission has repeatedly changed its mind about how to treat this issue only to end up right back where it started three years ago--promising a generic rulemaking. In the meantime, the Commission's only accomplishment has been to deny parties the right to adjudicate the issue and to delay any action on this issue until the only two plants, Diablo Canyon and San Onofre, for which this issue probably has any real significance have been licensed.

I cannot agree with the Commission's decision or its reasons for reaching that decision. The Commission's decision ignores fundamental principles of emergency planning, offends common sense, and abuses the legal process. I would recognize the obvious--that earthquakes ought to be considered for plants located in areas of high seismicity such as California, and let the parties adjudicate the specifics in individual cases. I would provide the parties to the Diablo Canyon proceeding an opportunity for a hearing and let them litigate whether the Diablo Canyon emergency plan is flexible enough to deal with the complicating effects of earthquakes on emergency planning.

History

The history of the Commission's handling of this issue shows exactly why the Commission's decision today is so disturbing. Rather than simply allowing the issue to be considered by a licensing board, a step that probably would have added about a week of hearing time to the San Onofre and Diablo Canyon proceedings, the Commission has instead followed a tortuous path from adjudication to generic rulemaking to case-by-case consideration, to generic adjudication, only to end up right back at generic rulemaking.

In early 1981 the staff took the position in the San Onofre proceeding that consideration of the complicating effects of earthquakes up to the Safe Shutdown Earthquake (SSE) was appropriate. The staff disagreed, however, when the Licensing Board tried to raise sua sponte the issue of the effects of earthquakes exceeding the SSE. The Commission on its own motion ordered the Licensing Board not to consider "the impacts on emergency planning of earthquakes which cause or occur during an accidental radiological release." Southern California Edison Co. (San Onofre Nuclear Generating Station, Units 2 and 3), CLI 81-33, 14 NRC 1091(1982). The Commission determined that its regulations did not require such consideration and concluded that whether the regulations should require such consideration was a generic issue to be decided by rulemaking. San Onofre, 14 NRC at 1091-92 (1981).

Based on the San Onofre decision, the Licensing Board in the Diablo Canyon operating license proceeding refused to allow any consideration of the effects of earthquakes on emergency planning at the Diablo Canyon site. There was, therefore, no opportunity to litigate any issue connected with the complicating effects of earthquakes on emergency planning.

After the Diablo Canyon Board's decision, the staff on June 22, 1982, issued a memorandum which stated that it was the staff's technical judgment that a generic rulemaking was not necessary because of the very low likelihood of earthquakes in most parts of the country. However, the staff took the view that for California and other areas of high seismic risk in the Western United States explicit, site specific consideration of the effects of earthquakes on emergency planning is necessary. As the staff explained:

It is the judgment of the staff that for most sites earthquakes need not be explicitly considered for emergency planning purposes because of the very low likelihood that an earthquake severe enough to disturb onsite or offsite planned responses will occur concurrently with or cause a reactor accident. Planning for earthquakes which might have implications for response actions or initiate occurrences of the "Unusual Event" or "Alert" classes in areas where the seismic risk of earthquakes to offsite structures is relatively high may be appropriate (e.g., for California sites and other areas of relatively high seismic hazard in the Western U.S.). Memorandum to the Commissioners from William Dircks, Executive Director for Operations, dated June 22, 1982, entitled "Emergency Planning and Natural Hazards," p.1.

The staff went on to say that it requests applicants for licenses for California facilities and the Federal Emergency Management Agency (FEMA)

to consider earthquake effects in their emergency planning and review. Memorandum of June 22, 1982, Enclosure at 3-4. In fact, at both San Onofre and Diablo Canyon the staff required the license applicants to specifically consider this issue.

The Commission realized that this position by the staff seemed to contradict the Commission's San Onofre decision and thus cast doubt on the validity of the Licensing Board's ruling in the Diablo Canyon case. The Commission asked the staff to elaborate and in a further memorandum, the staff repeated its conclusion that "planning for earthquakes which might have emergency preparedness implications may be warranted in areas where the seismic risk to offsite structures is relatively high (e.g. California sites...)." Memorandum to Chairman Palladino from William Dircks, Executive Director for Operations, dated January 13, 1984, entitled "Emergency Planning and Seismic Hazards," p. 2, f.n.2. The staff also stated that it thought current emergency planning review criteria were adequate for this. Id.

Given this position by the staff, the Commission decided to ask the parties to the Diablo Canyon proceeding whether and under what circumstances the effects of earthquakes on emergency planning should be considered for the Diablo Canyon plant. Pacific Gas and Electric Company (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI 84-4, 20 NRC__ (April 3, 1984). The Commission, referring to the staff's January 1984 memorandum, noted that the staff appeared "to believe that some specific consideration of the effects of seismic events may be warranted

for plants located in areas of relatively high seismicity." CLI 84-4, Slip Opinion at 2.

In its response to the Commission's order, the staff attempted to reverse course. Staff Counsel explained that while staff stated in its January 13, 1984 memorandum that "seismic events are considered and evaluated to a limited extent as part of our current emergency planning reviews, those staff reviews are informal and do not reflect a required licensing element which must be satisfied in order to warrant issuance of a license".¹ "NRC Staff's Memorandum Regarding Consideration of Effects of Earthquakes on Emergency Planning (CLI-84-4)", dated May 3, 1984, p.3, f.n.2.

Commission Decision

In its decision today, the Commission has concluded that there is no reason to depart from its decision in San Onofre that the NRC's regulations "do not require consideration of the impacts on emergency planning of earthquakes which cause or occur during an accidental release," for Diablo Canyon and that the determination of whether to

¹The flaw in the staff's argument is obvious. Having acknowledged that it is concerned enough about the issue to require licensees to consider it, the staff cannot now argue that "informal" review by the staff is a satisfactory substitute for formal review in individual licensing proceedings. If the issue is material to the Commission's licensing decision, as the staff's own statements and actions concede, then the agency must admit that satisfactory resolution of the issue is a required licensing element.

amend the regulations to include the consideration of earthquakes should be addressed as a generic matter. (CLI-84-12) Slip Op. at 1. There are several problems with the Commission's decision and its underlying rationale.

The cornerstone of the Commission's decision is the Commission's conclusion that the probability of an earthquake disrupting an emergency response is so low that it need not be considered in emergency planning. The basis for the Commission's conclusion is its determination that for various reasons there is unlikely to be a radiological release and an earthquake at the same time. The Commission's arguments on this score ignore one of the fundamental precepts of emergency planning: we plan for low probability occurrences because no matter how safe we try to make nuclear power plants there is always a possibility that some event will occur which will require use of one or more aspects of emergency planning. The probability arguments used by the Commission are really arguments that we do not need any emergency planning, rather than that we need not consider earthquakes in emergency planning. The Commission simply asserts that there is a low likelihood of a release and an earthquake at the same time and assumes that that ends the inquiry.

Unfortunately, the Commission ignores the fact that safety calculations are subject to some uncertainties. The philosophy behind emergency planning is to recognize this uncertainty and to provide defense in depth in protecting the public. Indeed, the Commission's emergency

planning regulations are founded on the judgment that adequate emergency planning is an essential element in protecting the public health and safety independent of the Commission's other regulations and safety reviews focusing on the design of the plant itself. Obviously, we do not plan for every conceivable but highly unlikely event. We should not, for example, waste resources planning for the effects of hurricanes on emergency responses in Kansas or for snow in Southern California. Instead, we plan to take into account the natural phenomena which present the more likely risks for a particular area. Thus, we consider hurricanes for plants in Florida, tornados for plants in the Midwest, and volcanic eruptions in the Pacific Northwest. By the same token, we should consider the complicating effects of earthquakes for plants in high seismic risk areas such as California.

The Commission tells us, however, that the probability of an earthquake disrupting an emergency response in an Emergency Planning Zone (EPZ) is too low even to be considered. To apply this argument to California, where almost 90 percent of the seismic activity in the United States occurs and where earthquakes which damage, obstruct or disrupt roads, buildings, bridges and communications networks occur with some regularity, simply ignores common sense. In support of this assertion, the Commission contends that the Diablo Canyon site is located in an area of low to moderate seismicity. This argument is based upon an analysis in the record of the recurrence rate for earthquakes in the central California coastal region for the years 1950 through 1974. What the Commission does not mention, however, is that the only plant in the

country with a comparable SSE and OBE (Operating Basis Earthquake)--the key bases for the seismic design of the plant--is San Onofre (.67g and .34g respectively). In fact, the SSE's and OBE's for plants in other parts of the country are significantly lower (for other plants the SSE is typically .25g or less and the typical OBE is .11 - .12g, with the highest being .13g) than those for Diablo Canyon (SSE of .75g and OBE of .20g). Clearly, by requiring the plant to be designed to withstand an earthquake with ground motions almost twice those of other plants in the country, the Commission explicitly made the technical judgment that the earthquake risk for the Diablo Canyon area is not comparable to other areas of the country, and is, in fact, much higher.²

²Publicly available information compiled by the U.S. Geological Survey (USGS) would seem to indicate that earthquakes of sufficient magnitude to cause possible damage, obstruction or disruption to roads, buildings, bridges and communication networks occur throughout many parts of California, including the San Luis Obispo area, with some regularity. "Earthquake History of the United States", Publication 41-1, 1982 Reprint with Supplement. According to this information, four earthquakes have occurred in the immediate San Luis Obispo area since 1830, and at least one of these earthquakes has been of magnitude 7-8 on the Modified Mercalli scale. *Id.*, pp. 138, 140, 141, 156, 162, 164. In addition, two other earthquakes, of magnitudes 6.5 and 7.5, have occurred within 50 miles of the Diablo Canyon site since 1922. "Earthquake Epicenter Map of California, 1900 through 1974", State of California, the Resources Agency, Department of Conservation 1978. This publicly available information, although not in the record of the Diablo Canyon proceeding, would also appear to contradict the Commission's assertions regarding the frequency of occurrence of earthquakes in the vicinity of the Diablo Canyon site which are sufficiently severe to cause damage to structures and disrupt communications. Much of this same information is also in the FSAR for Diablo Canyon, which is a part of the record in this proceeding.

Further, the Commission's argument must be considered in light of the other natural phenomena the Commission includes in its consideration of emergency planning. If the probability of an earthquake disrupting an emergency response in an EPZ in California is too unlikely to be considered, that probability must by definition be much lower than the probability of disruption caused by the other natural phenomena which the Commission does consider. It must, for example, be less likely than the probability that a tornado will disrupt an emergency response in an EPZ in the Midwest or that a hurricane will disrupt an emergency response in a California EPZ.

The probability that a tornado will travel through a particular 10 mile area and thereby initiate or disrupt response to an emergency at a nuclear plant must be quite low; yet, the Commission requires consideration of that issue for certain plants. Similarly, the probability of a hurricane striking the San Luis Obispo coastal area and initiating or disrupting an emergency response must also be quite low; yet, the Commission considered that very issue in the Diablo Canyon case. I see no factual basis for the Commission's assertion that earthquakes in California are so much more unlikely than either of these events that earthquakes need not be considered.

The Commission's order also misses another very important point. Emergency planning is not relevant only to accidents resulting in the offsite release of radiation. Emergency planning is also relevant for responses to emergencies which do not result in a radiological release,

including emergencies initiated or complicated by earthquakes below the SSE. For example, whether or not an earthquake results in the offsite release of radioactivity, an emergency plan must take into account the assurance of continued communication between a plant and offsite emergency response agencies, the ability to obtain damage estimates for the plant and the offsite transportation and communication facilities to provide data for decisions on appropriate responses, the availability of backup facilities to ensure continued functioning of an emergency response capability, and the ability to transport necessary personnel to a plant to deal with the emergency. In its June 22, 1982 memorandum to the Commission, the NRC staff recognized this:

"There is no explicit guidance in [the Commission's regulations] as to the extent to which adverse earthquake conditions are to be taken into account in emergency planning at particular sites...The occurrence of earthquakes of a nature that could have implications for onsite or offsite response actions or initiate occurrences of the "Unusual Event" or "Alert" class is an adverse characteristic of the type discussed above." Memorandum at 3-4.

The staff went on to note that they ask applicants for licenses for California facilities and FEMA to consider such earthquakes (smaller than the Safe Shutdown Earthquake) in their emergency planning for this very reason.

The Commission simply ignores the fact that the staff has been requiring licensees for plants located in California to consider the effects of earthquakes on emergency planning. The staff has stated that while it does not think such consideration is necessary for plants in most areas of the country, "planning for earthquakes which might have emergency

preparedness implications may be warranted in areas where the seismic risk to offsite structures is relatively high (e.g. California sites.)"³ Memoranda of June 22, 1982, and January 13, 1984. The complicating effects of earthquakes on emergency planning were formally considered by the staff in the San Onofre proceeding, and were informally considered by the staff for Diablo Canyon. By their own actions, the agency's technical experts have demonstrated that they consider this issue to be material to the Commission's licensing decisions in these two cases. Given the fact that the staff experts on this issue have been concerned enough to consider it, I see no basis for the Commission's argument that in the cases of Diablo Canyon and San Onofre, seismic effects on emergency planning are irrelevant. Since the issue is clearly material to the agency's licensing decision in those two cases, the Commission is required by law to grant the parties an opportunity to litigate that issue. See, UCS v NRC, No. 82-2053 (D.C. Cir. May 25, 1984.)

³In its response to the Commission's order, staff counsel attempted to withdraw this conclusion. The fact remains, however, that staff has indeed been considering the complicating affects of earthquakes on emergency planning at California plants, including Diablo Canyon. Staff required PG&E to prepare a report on this issue. Presumably, the staff does not ask license applicants to look at issues which it thinks are irrelevant. Perhaps the staff's new position has something to do with the fact that for the only two plants located in "high seismic areas", the staff has now completed its review of seismic effects on emergency planning. This appears to be the only plausible reason for such a radical change in staff's position. Further, staff explained that what it really wanted was to consider this issue, but only "informally". See, above at p.5.

Apparently recognizing the weaknesses in their low probability argument, my colleagues have also attempted to support their decision by arguing that the disruption to emergency response caused by fog, hurricanes and heavy weather are similar to the disruptions which may result from an earthquake. Thus, the Commission argues, emergency plans implicitly have enough flexibility to deal with earthquakes as well. This is an interesting argument. Unfortunately, the Commission cannot point to any evidence in the record of this proceeding to support such a factual finding. Although the Diablo Canyon record includes information on natural phenomena other than earthquakes, there was no discussion in that record of earthquake effects, or whether the plans for dealing with other natural phenomena are flexible enough to implicitly include the effects of earthquakes. The Commission's conclusion seems, therefore, to be based on the Commission's intuitive feeling that the finding ought to be true rather than on any kind of factual record. This is precisely the type of factual question that should only be decided based upon a site-specific, factual record, developed and tested in a hearing (or at least after consideration of information in the record of a rulemaking specifically addressing this issue.)

Finally, the Commission has decided that the regulations are not sufficiently clear on whether earthquakes must be considered in emergency planning and so intends to conduct a generic rulemaking on the issue. The Commission disagrees with the staff's view that a generic rulemaking is not necessary, although it offers no persuasive reason for rejecting

the staff's technical judgment on this question. Unfortunately, the Commission's belatedly renewed promise of a generic rulemaking appears to be little more than window dressing. The Commission's justification for not considering seismic effects on emergency planning at Diablo Canyon clearly shows that it has already decided the issue. If the Commission will not require the consideration of earthquakes for plants located in an area of the country where 90 percent of the seismic activity occurs, it is unlikely to conclude that they must be considered for plants elsewhere. Since the Commission appears to have already decided this fundamental issue, it is unclear what it hopes to accomplish with such a rulemaking. I have agreed to the Commission's decision to conduct such a rulemaking, but only because some consideration of this issue is better than no consideration at all.

It is absolutely amazing, the lengths to which the Commission will go to avoid finding that a party is entitled to a hearing on an issue. In this case, the Commission has constructed an elaborate, but flawed, rationale in an attempt to explain why earthquakes need not be considered in emergency planning for Diablo Canyon. The Commission has then proceeded, as a factual matter, to consider the effects of earthquakes on emergency planning. As a last resort, the Commission has again promised to conduct a generic rulemaking on this issue, a promise that it made three years ago but did not keep. The unfortunate consequence of this delay has been to put the issue off until the two California plants have been licensed.