

October 30, 1981



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In the Matter of  
SOUTHERN CALIFORNIA EDISON COMPANY, ET AL.  
(San Onofre Nuclear Generating Station, Units 2 and 3)  
Docket Nos. 50-361 OL and 50-362 OL

Dear Mr. Perry:

Enclosed please find a copy of the NRC Staff's Proposed Findings of Fact and Conclusions Of Law For Fuel Loading And Low Power Testing filed in this proceeding on October 29, 1981.

Sincerely,

Richard K. Hoefling  
Counsel for NRC Staff

Enclosure: As stated

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

SOUTHERN CALIFORNIA EDISON COMPANY,  
ET AL.

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

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Docket Nos. 50-361 OL  
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NRC STAFF'S PROPOSED FINDINGS OF FACT AND  
CONCLUSIONS OF LAW IN THE FORM OF A PROPOSED INITIAL  
DECISION PERMITTING FUEL LOADING AND LOW-POWER TESTING  
OF SAN ONOFRE NUCLEAR GENERATING STATION UNIT 2

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October 29, 1981

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TABLE OF CONTENTS

	<u>Paragraphs</u>
I. <u>INTRODUCTION</u> .....	1-21
II. <u>CONSIDERATION OF THE LOW-POWER ISSUE</u>	
A. RISK ASSOCIATED WITH THE ACTIVITY TO BE AUTHORIZED...	22-45
B. EMERGENCY PREPAREDNESS CRITERIA APPLICABLE TO THE ACTIVITY TO BE AUTHORIZED.....	45-52
C. EVALUATION OF THE STATE OF EMERGENCY PREPAREDNESS....	53-69
D. SUMMARY OF FINDINGS OF FACT WITH RESPECT TO THE LOW-POWER ISSUE.....	70-71
III. <u>CONCLUSIONS OF LAW</u> .....	Page 27
IV. <u>ORDER</u> .....	Page 29

## I. INTRODUCTION

1. The general background of this proceeding and the specific background dealing with the development of the geology/seismology contentions are fully set forth in this Board's Partial Initial Decision dealing with the geology/seismology contentions and will not be repeated here.

2. With respect to the emergency preparedness issue, the following contentions were admitted by the Board:

### Contention No. 1

Whether the state of emergency preparedness for SONGS 2 and 3 provides reasonable assurance that the offsite transient and permanent population within the plume exposure pathway Emergency Planning Zone, 10 C.F.R. § 50.47(c)(2), for SONGS 2 and 3 can be evacuated or otherwise adequately protected in the event of a radiological emergency with offsite consequences occurring at SONGS 2 and 3, as required by 10 C.F.R. § 50.47(a)(1), § 50.47(b)(10), and Part 50, Appendix E.IV.

### Contention No. 2

Whether there is reasonable assurance that the emergency response planning and capability of implementation for SONGS 2 and 3, affecting the offsite transient and permanent population, will comply with 10 C.F.R. § 50.47(a)(1) and (b) or (c)(1) as regards:

- A. the procedures for notification by Applicants of State and local response organizations, 10 C.F.R. § 50.47(b)(5), and for notification of and continued communication among emergency personnel by all involved organizations, 10 C.F.R. § 50.47(b)(6);
- B. the means for notification and instruction to the populace within the plume exposure pathway Emergency Planning Zone, 10 C.F.R. § 50.47(b)(5);

- C. the information and the procedures for dissemination of the information to the public within the plume exposure pathway Emergency Planning Zone on a periodic basis on how they will be notified and what their actions should be in the event of an emergency, 10 C.F.R. § 50.47(b)(7);
- D. the arrangements for medical services for contaminated and injured individuals, 10 C.F.R. § 50.47(b)(12);
- E. necessary transportation and communication equipment, and the operation of the emergency operations centers of the principal response organizations, 10 C.F.R. § 50.47(b)(8);
- F. the capability of each principal response organization to respond and to augment this initial response on a continuous basis, 10 C.F.R. § 50.47(b)(1);
- G. radiological emergency response training to those who may be called on to assist in an emergency, 10 C.F.R. § 50.47(b)(15);
- H. the methods, staffing, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition within the plume exposure pathway EPZ for SONGS 2 and 3, 10 C.F.R. § 50.47(b)(9);
- I. the physical design, communications equipment, and operating procedures for the interim Emergency Operations Facility, 10 C.F.R. § 50.47(b)(3) and § 50.47(b)(8);
- J. the methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition within the ingestion pathway EPZ for SONGS 2 and 3, 10 C.F.R. § 50.47(b)(9); and
- K. general plans for recovery and reentry, 10 C.F.R. § 50.47(b)(13).

PLUME EXPOSURE PATHWAY EPZ contention

The emergency response plans fail to meet the requirements of 10 C.F.R. § 50.47(c)(2) because local emergency planning officials have arbitrarily established the boundaries of the Plume Exposure EPZ in that they have mechanically applied a 10 mile boundary and that the Interagency Agreement (IAEP) among all local jurisdictions defines the EPZ by drawing compass lines on a map of the area. In determining the exact size of the EPZ, emergency planning officials have failed to consider the following local conditions:

1. topography
2. meteorology
3. evacuation routes
4. demography
5. jurisdictional boundaries
6. SAI report
7. land characteristics

3. In addition, the Board in its Orders of July 29 and August 7, 1981 raised sua sponte an issue concerning the degree of consideration which should be given to earthquakes in excess of the safe shutdown earthquake in emergency planning. The Commission is currently considering the appropriateness of this issue. See the Commission's Order of September 18, 1981 in this proceeding. The Board considers its issue to be relevant only to full power operation of the San Onofre Nuclear Generating Station, Units 2 and 3 (SONGS 2 and 3) and consequently the Board will not consider its issue further in this Initial Decision.

4. Two hearing sessions were held on these issues in Anaheim, California. The first session ran from August 25, 1981 through September 4, 1981. The second session ran from September 21, 1981 to September 29, 1981. Parties to the proceeding included Applicants, the

NRC Staff and a consolidated intervenor group consisting of GUARD, Carstens, and Friends of the Earth, et al. (Intervenors). (Tr. 6829).

5. On August 31, 1981, during the hearing on the emergency preparedness issues, Applicants filed their "Alternative Motion of Applicants Southern California Edison Company, et al., for an Operating Licensing for Fuel Loading and Low-Power Testing" (Low-Power Motion) made pursuant to 10 C.F.R. § 50.57(c). (Tr. 8449) The low-power motion sought authorization to load fuel, proceed to initial criticality, perform start-up testing at zero power and operate San Onofre Nuclear Generating Station, Unit 2 (SONGS 2) for purposes of testing at reactor core power levels not in excess of 5 percent of rated power.

6. Under § 50.57(c):

Action on such a motion by the presiding officer shall be taken with due regard to the rights of the parties to the proceedings, including the right of any party to be heard to the extent that his contentions are relevant to the activity to be authorized.

At the request of the Board Chairman (Tr. 8468), Applicants proposed an issue, reflecting the admitted contentions to the extent relevant to issuance of the low-power license sought. That issue was as follows:

Whether there is reasonable assurance of adequate protection to the public during fuel loading and low power testing, considering the risk to the public represented by those activities and the emergency preparedness in place during those activities. (Tr. 8658).

7. The Board ruled that the issue as proposed by Applicants' counsel would be deemed a part of their motion for a low-power license. (Tr. 8658). Intervenors and Staff were requested by the Board to comment

on the record about Applicants' proposed issue by September 3, 1981.  
(Tr. 8659-60)

8. On September 3, 1981, the Intervenors did not propose any alternative issue(s); rather, they expressed tentative agreement with Applicants' proposed issue on the condition that they be given until September 9, 1981 to file written suggestions on alternative issues.  
(Tr. 9226)

9. The Staff stated its general agreement with the Applicants' proposed issue but suggested some minor modifications to which Applicants had no objection. (Tr. 9231). The issue as modified by Staff is:

Whether there is reasonable assurance of adequate protection to the health and safety of the public during fuel loading and low power testing, considering the risk to the public presented by those activities and the level of emergency preparedness in place during those activities. (Tr. 9232).

10. The Board tentatively accepted the issue as modified by the Staff, with the understanding that Intervenors would have until September 9, 1981 to provide in writing any further changes or alternative issues (Tr. 9233), and scheduled a conference call for September 10, 1981, to further discuss the matter.

11. On September 10, 1981, the Chairman of the Board convened the conference call at the time agreed upon, all parties participating. The Intervenors, among other things, informed the Board Chairman and the parties of the Intervenors' filing made on September 9, 1981 which proposed two additional issues for consideration on Applicants' motion for a low-power license. Mr. Wharton, who participated as Counsel for

Carstens et al., in the geology/seismology hearings, indicated that he did not make a filing on Applicants' motion for a low-power license.

12. The Staff urged that the principles of 10 C.F.R. § 2.714 should govern consideration of untimely contentions. The Board Chairman asked for Intervenors' views concerning the applicability of 10 C.F.R. § 2.714 to the two additional issues proposed by Intervenors. Mr. McClung, Attorney for Intervenors at this time indicated that he considered only the second issue to be untimely and agreed to file a document making the showing required by § 2.714 for nontimely filings.

13. Finally, in response to an inquiry by the Board Chairman, Intervenors stated their agreement with Applicants' proposed issue as modified by the NRC Staff on September 3, 1981. The Chairman of the Board indicated that the Board would rule on Intervenors' proposed additional issues at the time the evidentiary hearing reconvened in Anaheim, California on September 21, 1981.

14. In their filings of September 9, 1981 and September 14, 1981, Intervenors raised two additional issues for consideration at a low-power hearing. The first issue dealt with the need for enhanced emergency preparedness capability at the low-power stage due to an alleged inter-connection between SONGS 2 and SONGS 1. The second issue dealt with the status of certain TMI Action Plan items with respect to SONGS 2.

15. Both the Applicants and the Staff submitted written memoranda objecting to consideration of the two additional issues at a hearing held with respect to the Applicants' low-power motion. See "Applicants' Memorandum of Law and Opposition to Intervenors' Proposed Issues Re Motion for Fuel Loading and Low-Power Testing License" of September 18,

1981, and the "NRC Staff Response to Intervenors' GUARD, Carstens, et al., Request for Consideration of Two Additional Issues in the Context of Low-Power Licensing" of September 18, 1981.

16. On September 23, 1981, oral argument was held before the Board on the two additional issues proposed by Intervenors. (Tr. 9949-9973).

17. At the suggestion of the Board, with respect to the TMI Action Plan items, Intervenors consulted with the NRC Staff off the record and the product of these discussions was a withdrawal by Intervenors of their issue on this matter. (Tr. 9949-73).

18. On September 24, 1981, the Board denied Intervenors' proposed issue relating to the interconnection of SONGS 1 and SONGS 2. The Board based its ruling primarily on Intervenors' failure to meet the specificity requirement of 10 C.F.R. § 2.714. The Board found it uncertain as to what the contention envisioned. Consequently there was no clear indication as to what the parties were to respond to. (Tr. 10099-102).

19. At this time, the Board would note that the interconnection issue was raised for the first time by Intervenors in response to the low-power motion. Intervenors argue at length in their "Brief of Proposed Findings of Fact and Conclusions of Law In Opposition To Applicant's Alternative Motion For Operating License For Fuel Loading and Low Power Testing" (Intervenors' Findings) filed October 21, 1981 that the interrelationship between SONGS 1, 2 and 3 as regards the risk associated with facility operation was improperly excluded from consideration at the low-power hearing. Such is not the case. In an operating license proceeding, the Board is, as a general matter, limited

in its inquiry to issues properly placed before it by the parties. Section 10 C.F.R. 2.760a. The issue of the interconnection or interrelationship between the various SONGS units and the contribution such interrelationship might make to the risks associated with the operation of those units was never before this Board by virtue of the previously admitted contentions. As we noted in our ruling excluding the interconnection issue, Section 50.57(c) does not contemplate a new opportunity for filing contentions. Tr. 10,099; See, Pacific Gas and Electric Company (Diablo Canyon Nuclear Plant, Units 1 and 2), CLI-81-5, 13 NRC 361, 362 (1981). Consequently, when the low-power issue was framed, that issue was properly limited to the risk from operation of SONGS 2. This was, in the Board's view, a correct distillation of Intervenor's previously admitted contentions which contained no interrelationship component. Thus, when Intervenor presented their interconnection issue in response to the low-power motion, it was a new issue, unrelated to the contentions previously admitted. At the hearing, the Board dismissed the issue for lack of specificity, a fundamental requirement of 10 C.F.R. § 2.714. Accordingly, as the interrelationship issue was not a matter in controversy before the Board during the low-power hearing, consideration of this subject was irrelevant, that is, beyond the scope of the proceeding, and objections so framed were properly sustained by the Board. The arguments in Intervenor's Findings are not on point.

20. Consequently, the only issue before the Board for consideration in the low-power hearing was the issue originally developed by the Applicants and modified by the NRC Staff and consented to by Intervenor. The Board considers this issue to encompass Intervenor's full-power

contentions to the extent that these contentions are relevant to the activities sought to be authorized in the low-power motion under 10 C.F.R. § 50.57(c).

21. On September 30, 1981, a hearing was held on Applicants' low-power motion at Anaheim, California. Both Applicants and the NRC Staff presented direct testimony on the issue in controversy. In addition, the Federal Emergency Management Agency (FEMA) presented testimony. Intervenors did not present any direct testimony with respect to the low-power issue.

## II. CONSIDERATION OF THE LOW-POWER ISSUE

22. Testimony was received on the activities sought to be authorized by Applicants' motion under 10 C.F.R. § 50.57(c) for a license for fuel loading and low-power testing from Applicants' witness, Mr. Richard M. Rosenblum.

23. Mr. Rosenblum testified that there are four categories of activities to be performed over an approximately sixteen-week period subsequent to the issuance of a fuel load and low-power license. They are: (1) fuel loading; (2) post-core loading hot functional testing; (3) initial criticality and low-power physics testing; and (4) power escalation to five percent of full power. (Rosenblum Testimony, pp. 2-5; the Testimony of Richard Rosenblum follows Tr. 11,137).

24. The specific activities which the Applicants propose to undertake during fuel loading and low-power testing are presented in an exhibit to Mr. Rosenblum's testimony (Applicants' Exhibit 160).

25. Mr. G. Norman Lauben and Dr. Patrick D. O'Reilly were the witnesses for the NRC Staff concerning the relative risk associated with fuel loading and low-power operation as compared to full power operation for the significant postulated events which could occur at SONGS 2 that could potentially affect public health and safety. Mr. Lauben and Dr. O'Reilly also addressed the safety significance of the low-power testing program as it would affect the need to have in place an emergency plan meeting all the requirements of the "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness In Support Of Nuclear power Plants," Rev. 1, November 1980 (NUREG-0654).

26. Mr. David R. Buttemer was the primary witness for the Applicants regarding safety analyses of certain accident sequences for SONGS 2 at low power, and the risks of fuel loading and low-power operation relative to those associated with full-power operation.

27. Mr. Lauben and Dr. O'Reilly of the NRC Staff testified that there are three major factors which contribute to a substantial reduction in risk for low-power testing as compared to continuous full-power operation. They are: (1) additional time available for the operators to correct the loss of important safety systems needed to mitigate relatively high risk events, or to take alternate courses of action; (2) the fission product inventory during this time would be very much less than during full-power operation; and (3) a reduction in required capacity for mitigating systems at low power. (Lauben/O'Reilly Testimony, p. 2; the Testimony of G. Norman Lauben and Dr. Patrick O'Reilly follows Tr. 11,319).

28. Mr. Lauben and Dr. O'Reilly further testified that for a Combustion Engineering-designed PWR the significant postulated events that could potentially affect the public health and safety during low-power testing are: (1) small break LOCAs with loss of the emergency core cooling system (ECCS); (2) transients involving total loss of feedwater; and (3) failure of double check valves between the reactor coolant system (high pressure) and the residual heat removal system (low pressure) which results in a LOCA (inter-system LOCA) outside containment, i.e., the interior of the reactor vessel communicates directly with the environment. However, for SONGS 2, the installation of leak testing equipment to periodically test the condition of the two check valves between the reactor coolant system and the residual heat removal system (called the shutdown cooling system in Combustion Engineering-designed PWRs) has essentially eliminated the inter-system LOCA as a dominant risk contributor for SONGS 2. (Lauben/O'Reilly Testimony, pp. 2-3; SER, Section 5.4.3 (NRC Staff Exhibit 1); Lauben, Tr. 11,336-337).

29. The NRC Staff performed a plant-specific relative risk analysis (Lauben, Tr. 11,326-327, 11,336-337) which determined the reduction in risk of public exposure for low-power operation, taking into account the additional time available for reactor operators to take corrective actions and the reduced fission product inventory for operation at 5% power for up to six months. Risk is roughly proportional to the probability of severe accidents (in which the heat sink is lost) and to the fission product inventory in the core. (Lauben/O'Reilly Testimony, p. 3). For this analysis the overall reduction in risk to the public was

found to be 500 to 10,000 as compared to continuous full-power operation. (Id.)

30. Moreover, Mr. Lauben and Dr. O'Reilly testified that, based on the actual power history of other reactors during their low-power testing programs, the actual power history expected at SONGS 2 would result in even less available fission product inventory and lower decay heat since the peak power during the testing program is expected to be 4% of rated capacity for a maximum period of 20 days of operation. Consequently, the relative risk at low power would be further reduced by a factor of 2. It was concluded that this would make the reduction in relative risk to the public at low power a factor of 1000 to 20,000 as compared to full-power long-term operation. (Lauben/O'Reilly Testimony, p. 4; Lauben, Tr. 11,331-332).

31. Mr. Lauben and Dr. O'Reilly also addressed the increased time available at low power for operators to diagnose and take corrective actions for those significant postulated events that could potentially involve risk to the public. With respect to small break LOCAs, they stated that the core would have to remain uncooled for a significant length of time (approximately 10 hours) before fuel element cladding would fail due to overheating. For this overheating to occur the ECCS system, designed to operate to cool the core at up to 102% power, must have failed. Furthermore, for any risk to the public to occur the reactor coolant pressure boundary and the containment would have to be violated. (Lauben/O'Reilly Testimony, pp. 4-5).

32. A bounding calculation was performed for a large break LOCA. In such a case, with no pumped ECCS, refill by the accumulators is completed

about 70 seconds after the break. The water injected by the accumulators is borated, thus providing an added margin of safety since it has excess reactivity for purposes of shutdown. The water level in this case is still above the top of the core. At this time, the water in the reactor vessel would begin to heat up and boil away. However, the core does not immediately start to heat up rapidly until a substantially greater amount of water has boiled off. The analysis for this case shows that the fuel cladding temperature does not begin to rise rapidly to temperatures at which metal-water reaction (1800°F or higher) would occur for at least 15 hours. This is the minimum time available for remedial action even for this highly unlikely event--large break LOCA coupled with ECCS failure. (Lauben/O'Reilly Testimony, pp. 5-6; Lauben, Tr. 11,330-331, 11,317).

33. With respect to the more credible small break LOCA (again assuming failure of the ECCS), the time available is longer since this accident sequence would not cause core uncover for about 5 hours and rapid increase in fuel clad temperature, leading to severe core damage, would not begin for about 21 hours. For the actual planned low-power test program at SONGS 2, the time available for remedial action is extended many more hours. (Lauben/O'Reilly Testimony, pp. 6-7). Because of the time available for the operators to correct malfunctions in the ECCS or to initiate cooling with the normal charging system, the probability of excessive fuel damage and significant radiological release is reduced by at least a factor of 400 to 8000 for low-power operation as compared to full-power operation. (Lauben/O'Reilly Testimony, p. 7).

34. Mr. Lauben and Dr. O'Reilly also addressed the relative reduction in risk to the public at low power of the potential effects of

transients involving total loss of feedwater. They concluded that at 5% power the number of these events resulting in failure to adequately cool the core is greatly reduced for two primary reasons. First, all transients initiated by turbine trip are eliminated since the turbine is not on line. Second, other transients causing total loss of feedwater become negligible in terms of core damage since core heat is transferred through the steam generators from the primary to secondary systems.

After a scram from 5% power, it would take about 2 1/2 days for the steam generators to boil dry, assuming no feedwater makeup. At that point, fission product heat will have decayed sufficiently so that passive steam heat losses (radiant heat transfer) would be enough to cool the reactor even if no corrective action were taken. These considerations would result in a total risk reduction associated with these events from 10,000 to 100,000 for low-power operation. (Lauben/O'Reilly Testimony, pp. 7-8; Lauben, Tr. 11,333).

35. The NRC Staff witnesses examined other transients (steam line break, steam generator tube rupture, rod ejection and ATWS) and noted that these transients do not become dominant contributors to risk at low power due to a risk reduction similar to that for feedwater transients. (Lauben/O'Reilly Testimony, p. 8).

36. In particular, the NRC Staff considered the risk potential for ATWS events at low-power. The spectrum of ATWS events were examined and factored into the relative risk assessment. They concluded that the number of ATWS events which can contribute to risk at low power is much reduced as compared to full power. Moreover, for low-power operation the only significant ATWS event is rod withdrawal followed by failure to

scram. (Id.) ATWS events involving loss of feedwater are significant for full power; however, these events are not significant at low power unless coupled with rod withdrawal. In the event of total loss of feedwater followed by a failure of the reactor to scram, a highly unlikely scenario, the water in the steam generators would completely boil off in about 30 minutes. During this period the operator has various options available to safely shut down the reactor, including initiation of the boron injection system and diagnosis and correction of the failure to scram. These actions would terminate the event before boil-off of significant reactor vessel inventory thus precluding the onset of severe core damage. (Lauben/O'Reilly Testimony, p. 9). Moreover, the risk of an ATWS event at low power is reduced since significant overpressurization of the primary system does not occur because of the low integrated reactor power. (Id.)

37. Mr. Lauben and Dr. O'Reilly concluded that there is virtually no need for a qualified emergency plan since there is abundant time available (at least 20 hours) to take corrective action to mitigate or terminate the most likely accident scenarios which could affect public risk during low-power testing. (Id.)

38. The witness for Applicants, Mr. David R. Buttemer, presented testimony concerning a qualitative evaluation of the relative risk associated with low-power operation as compared to full-power operation and he concluded that the risk is much lower during low-power testing. (Buttemer Testimony pp. 6-8; Tr. 11,236; the Testimony of David Buttemer follows Tr. 11,198).

39. Mr. Buttemer explained that a major factor affecting public consequences is the inventory, or amount, of radioactive nuclides available at the plant. Because of the low reactor power levels and short operating times planned in the low-power test program, the fission product inventory within the core (which, during this program, is essentially the only source of radioactivity at the plant) is a small fraction of the inventory existing during normal power operation. Consequently, the fission product decay heat levels are substantially lower which, in the event of an accident, results in slow heat-up rates allowing substantial time for mitigative action. (Buttemer Testimony, pp. 5-6).

40. Mr. Buttemer identified a number of factors which reduce the likelihood of an accident being initiated by a transient during low-power operation. They are: (1) tests will be conducted under strict procedural controls under direct supervision of engineering and technical supervisors; (2) the turbine generator system will not be operating during low-power physics and natural circulation tests; (3) feedwater will be supplied to steam generators by the safety grade auxiliary feedwater system; and (4) the steam produced in the steam generators will be condensed in the main condensor. (Buttemer Testimony, p. 7).

41. Mr. Buttemer also identified several factors which would increase the likelihood of an accident being initiated during low-power testing. Those factors are: (1) the possibility of somewhat higher equipment break-in failures; (2) uncertainties in integrated system performance; and (3) changes in maintenance, operating and emergency procedures which may be necessary. (Id.)

42. On the basis of the factors increasing and decreasing the likelihood of an accident initiated by a transient, Mr. Buttemer concluded that the likelihood of transient accident initiators considered would be about the same for either low-power or full-power operation. However, he noted that if an accident was initiated by a transient it would progress differently at low power than at full power since the safety systems designed for full power would be available during low-power testing. If these systems failed, excessive core temperatures will not be reached for several tens of hours thus providing sufficient time for diagnostic and corrective operator action. (Buttemer Testimony, p. 8).

43. The Board finds that the dominant contributors to risk for SONGS 2 during low-power testing are: (1) small break LOCAs with loss of emergency core cooling systems (ECCS); and (2) transients involving total loss of feedwater. For these significant postulated events that could potentially affect the public health and safety during low-power testing, the Board concludes that the reduction in risk to the public at low power is substantial as compared to full power, taking into account the time available (at least 20 hours) to take corrective action, reduced fission product inventory, and lower decay heat. With respect to small break LOCAs coupled with a failed ECCS, the relative risk to the public is reduced by a factor of 400 to 8000 for low-power operation. For transients involving total loss of feedwater, the total risk reduction associated with these events at low power is from 10,000 to 100,000.

44. The Board further finds that, although it is not a dominant contributor to risk at low power, a large break LOCA with a completely

failed ECCS, the most severe postulated event considered, would result in no significant core damage for at least 15 hours, thus providing time for corrective action to be taken.

45. Consequently, the Board finds that the risk to the health and safety of the public from the activities proposed by Applicants in their Exhibit 160 for the fuel loading and low-power testing program at SONGS 2 is significantly reduced as compared to the risk presented by full-power operation.

B. Emergency Preparedness Criteria Applicable To The Activity To Be Authorized

46. NRC Staff witnesses Brian Grimes and John Sears presented testimony with respect to the criteria which had been developed by FEMA and the NRC Staff in the emergency preparedness area for low-power licenses. (Tr. 11,338, et seq.)

47. In February 1980 FEMA and the NRC Staff agreed that the joint NRC/FEMA Steering Committee should develop criteria to assess the adequacy of emergency preparedness for low-power testing. (Sears Testimony, p. 4; the Testimony of John Sears follows Tr. 11,340).

48. Subsequently, the NRC/FEMA Steering Committee developed criteria for low-power testing at new commercial nuclear facilities. (Exhibits A and B to the Sears Testimony).

49. The NRC/FEMA criteria state that public health and safety is adequately protected if a commercial nuclear facility is located in a state whose nuclear power plant emergency plan has received a concurrence under the previous voluntary concurrence program administered by the NRC and based on an evaluation by a multiagency Federal Regional Advisory

Committee, and if the operator plans at the site are consistent with NRC Regulatory Guide 1.101, Revision 1, March 1977 and the requirements of 10 C.F.R. Part 50, Appendix E, December 24, 1970, as amended January 11, 1973 (old Appendix E). (Sears Testimony, p. 5; Exhibit B to the Sears Testimony).

50. The NRC/FEMA criteria were based on a determination that the risks associated with low-power operation were minimal and that the development of specific low-power testing emergency preparedness criteria was not warranted. (Exhibit A to the Sears Testimony). Less stringent criteria with respect to the state of emergency preparedness would adequately protect the public health and safety during low-power operation (up to 5 percent power). (Sears Testimony, p. 5; Exhibit B to the Sears Testimony).

51. Mr. Grimes testified that the original Steering Committee judgment was based on a qualitative assessment of the risk involved with low-power operation. Since that time quantitative assessments have been made which have confirmed the earlier qualitative assessments. Mr. Grimes referred to the specific assessment which was performed for SONGS 2 by the NRC Staff which quantified a substantial reduction in risk associated with low-power operation. (Grimes, Tr. 11,342-343). (See also Subsection II.A above of this Initial Decision).

52. The Board finds that the criteria developed by the joint NRC/FEMA Steering Committee and adopted by FEMA and the NRC Staff are appropriate criteria for judging the adequacy of the state of emergency preparedness in place for low-power operation. The evidence is uncontroverted that the NRC/FEMA criteria were developed by NRC Staff

personnel knowledgeable in this area, e.g., Mr. Grimes, and the Federal agency charged with expertise in this area, i.e., FEMA. Qualitative assessments of the level of risk associated with low-power operation have been confirmed by the detailed quantitative evaluations performed by the NRC Staff specifically for SONGS 2. The Board adopts the joint NRC/FEMA Steering Committee criteria as the appropriate criteria to judge the adequacy of emergency preparedness for low-power operation.

C. Evaluation of the State of Emergency Preparedness

53. The NRC/FEMA criteria were applied by FEMA and the NRC Staff to SONGS 2. (NRC Staff Exhibit 13; Sears Testimony, p. 6).

54. The NRC/FEMA criteria call for operator plans at individual sites to be consistent with both old Appendix E and Regulatory Guide 1.101. With respect to SONGS 2, the NRC Staff testified that these criteria had been met and, in fact, exceeded. The Staff has reviewed the state of the Applicants' onsite emergency preparedness against the specific criteria of the sixteen planning standards in Part II of NUREG-0654. The review is documented the SER, Section 13.1 (NRC Staff Exhibit 1); Supplement No. 1 to the SER, Section 22 (NRC Staff Exhibit 2); and Supplement No. 3 to the SER, Section 13.3 (NRC Staff Exhibit 12). (Sears Testimony, p. 3).

55. Mr. Sears testified that the Staff has concluded that the Applicants' state of emergency preparedness meets the current requirements of the Commission's regulations and conforms to the guidance of NUREG-0654. (Sears Testimony, p. 4). As the current requirements exceed the criteria set forth by the Steering Committee, those criteria are met. (Sears Testimony, p. 6).

56. Thus the Applicants' onsite emergency preparedness meets the substantially upgraded emergency planning criteria currently applied thereby encompassing the older requirements. (Grimes, Tr. 11,342).

57. With respect to the offsite NRC/FEMA criteria, Mr. Sears testified that the State of California had in effect a plan which had received concurrence under the NRC's previous voluntary concurrence program. (Sears Testimony, p. 6).

58. FEMA also testified that the NRC/FEMA Steering Committee criteria in that area had been satisfied. (NRC Staff Exhibit 13).

59. Mr. Kenneth Nauman of FEMA testified that the State of California Nuclear Power Plant Plan was developed in 1975. The Plan was modified in 1978 and received NRC concurrence. The California Plan was further modified in March of 1981 and, as modified, currently is in effect. The 1981 revision was an elaboration of the 1978 Plan and, in FEMA's judgment, constituted an improvement over that earlier 1978 plan which had received NRC concurrence. (Nauman, Tr. 11,306-307).

60. The NRC Staff assessed the overall emergency preparedness, i.e., both onsite and offsite, for SONGS 2 against the NRC/FEMA Steering Committee criteria. The Staff concluded that the criteria were met and that the overall state of emergency preparedness for SONGS 2 was adequate to protect the public health and safety during fuel loading and low power (up to 5 percent power) testing. (Sears Testimony, pp. 6-7).

61. The Board notes that the testimony of both FEMA and NRC Staff personnel clearly demonstrated that the NRC/FEMA criteria for low-power operation were satisfied. This testimony was uncontroverted. Consequently, the Board finds that the NRC/FEMA criteria for SONGS 2 have

been satisfied both with respect to onsite emergency preparedness and offsite emergency preparedness.

62. In its Memorandum of July 17, 1981 (NRC Staff Exhibit 13), FEMA noted the inadequacy of State and local plans and preparedness for full power operation based upon the deficiencies with respect to compliance with the planning standards in 10 C.F.R. § 50.47(b). These deficiencies had been found by FEMA after its review of offsite emergency preparedness associated with SONGS 2 and 3 and documented in the FEMA findings and determinations of June 3, 1981. (NRC Staff Exhibit 11). Although not required by the NRC/FEMA Criteria, the NRC Staff nevertheless analyzed the deficiencies in the context of low-power operation. The Staff grouped the deficiencies into three categories, specifically, (1) lack of preparation in use of the Emergency Broadcast System and in rumor control, (2) the need for further training for radiological monitoring and assessment for local jurisdictions, and (3) lack of coordination between counties for traffic control. Mr. Sears testified that the items identified affected areas well offsite and beyond the area of concern for low-power operation. Due to the extended period of time available in the development of any accident occurring at low power, no extensive notification provisions were felt necessary by the Staff. With respect to radiological monitoring and assessment, the Staff concluded that the Applicants were well qualified to perform monitoring and to assess radiological releases that might be associated with low-power accidents. Finally, again as extensive time is available for any needed protective measures in the local area that might be affected by a low-power incident, the Staff concluded that extensive prior coordination between

the counties for traffic control was not needed. Consequently, the Staff concluded that the specific deficiencies identified by FEMA were not significant in the context of low-power operation for SONGS 2. See 10 C.F.R. § 50.47(c)(1) (Sears Testimony, pp. 7-8).

63. The Applicants also presented testimony with respect to the state of emergency preparedness for low-power testing. Mr. David Pilmer testified that the Emergency Plan for SONGS 2 and 3 (Applicants' Exhibit 51) will be in effect prior to the first fuel loading activities including a complete set of implementing procedures and the accomplishment of all required training. (Pilmer Testimony, p. 1; the Testimony of David Pilmer follows Tr. 11,243).

64. Mr. Pilmer testified that emergency response personnel will be available during fuel loading and low-power testing at SONGS 2. Certain key emergency response personnel who would respond to a SONGS 2 emergency are the same as would respond to a SONGS 1 emergency. This is also the case for the emergency support organization. These key emergency response and emergency support personnel have had exercise experience and emergency response training at SONGS 1 which is directly applicable to SONGS 2. (Pilmer Testimony, pp. 1-3).

65. Mr. Pilmer testified that the Applicants have examined the activities which would be authorized by the low-power license to determine what emergencies should be planned for. Following fuel loading and prior to initial criticality, the fission product inventory in the core is exceedingly small (arising from naturally occurring spontaneous fissions and subcritical multiplication of the installed neutron sources) and cannot possibly cause offsite doses in the Protective Active Guide

(PAG) range from any conceivable scenario. Accidental criticality during this period is essentially precluded because of the large shutdown margin imposed for these activities. During initial criticality and zero power physics testing, fission product generation is sufficiently low as is the associated decay heat generation that offsite doses in the PAG range would not be obtainable. Adequate planning will be in place to deal with any accidents arising during these activities. (Pilmer Testimony, pp. 3-5).

66. During the final two weeks of testing which will require reactor power levels generally between 3 and 5 percent, the need for taking protective actions offsite could arise although a time period much longer than if the reactor were operating at full power would be required to produce significant core damage and containment failure. (Pilmer Testimony, p. 5).

67. The longer period of time available for the development of a serious accident at these reduced power levels would increase the opportunity for successful intervention by operator action to halt the accident sequence. The longer time period would allow for successfully restoring cooling to the core by repairing equipment or making temporary alignment of other equipment to deliver cooling water to the reactor. (Pilmer Testimony, pp. 6-7).

68. Should an emergency arise, offsite authorities will be notified under the Emergency Plan. However, because of the length of time available, offsite authorities could carry out any recommended protective actions even without detailed emergency planning in place. (Pilmer Testimony, p. 7).

69. The Board concludes that the level of emergency preparedness in place at SONGS 2 is adequate to protect the health and safety of the public during fuel loading and low-power testing up to 5 percent power. The Board bases its conclusion on a finding that the NRC/FEMA Steering Committee criteria for fuel loading and low-power testing are indeed adequate to protect the public health and safety and upon a further finding that these criteria have been met with respect to SONGS 2. The Applicants' testimony with respect to the degree of emergency preparedness needed for fuel loading and low-power testing and the degree of emergency preparedness in place is consistent with the overall finding by the NRC Staff that emergency preparedness for SONGS 2 is adequate to permit the activity sought to be authorized under the low-power license. In making its finding, the Board also considered FEMA's view that, with respect to offsite emergency preparedness, low-power testing could go forward without endangering the health and safety of the public. The Board also took note of the fact that, while not required, there is in place with respect to San Onofre a state of emergency preparedness substantially in excess of that called for by the NRC/FEMA Steering Committee criteria. The NRC Staff has testified that onsite emergency preparedness in full conformance with the Commission's current regulations is now in place. With respect to offsite emergency preparedness, a voluminous record has been amassed before this Board dealing with the capabilities of various offsite local, county and state agencies for dealing with a radiological emergency. That record demonstrates a substantial degree of readiness at San Onofre which could

be called upon to provide additional assurance that the public health and safety will be protected during fuel load and low-power testing.

D. Summary of Findings of Fact With Respect To The Low-Power Issue

70. Quantitative risk assessment establishes that operation of SONGS 2 for fuel loading and low-power testing poses substantially less risk to the public health and safety than full-power operation. Analyses of postulated accidents at low-power operation demonstrate that, even in the event of the most severe postulated accident considered and even assuming 180 days prior low-power operation, at least 15 hours would be available for corrective action to be taken before significant core damage would start to occur. For the most likely events, approximately 20 hours would be available to take corrective action. For the above reasons, the Board concludes that the fuel loading and low-power testing program proposed by Applicants will result in much lower risks to the public health and safety than full-power operation.

71. Emergency preparedness at SONGS 2 meets or exceeds the current NRC/FEMA criteria for low power. Onsite emergency preparedness is in full compliance with the Commission's current regulations. Additionally, the entire record developed in this proceeding amply demonstrates that the state of offsite preparedness is substantial. Given the time periods necessary for development of an accident at low power, adequate measures can be taken to protect the public health and safety in the unlikely event of a radiological accident.

### III. CONCLUSIONS OF LAW

The conclusions of law which follow are in addition to those conclusions of law reached by this Board with respect to the geology/seismology contentions considered in this proceeding. Any finding of fact which is more properly a conclusion of law is hereby incorporated in these conclusions of law.

The Board has, in the context of the contention developed for the low-power proceeding, considered the contentions admitted previously dealing with full-power operation to the extent relevant to the activities sought to be authorized in Applicants' low-power motion. 10 C.F.R. § 50.57(c).

Upon consideration of the record of the proceeding and in light of the foregoing findings and discussion, the Board concludes that, with respect to the requirements of the Atomic Energy Act of 1954, as amended, and the rules and regulations of the Commission relating to onsite and offsite emergency preparedness:

- (1) The deficiencies found with respect to compliance with the planning standards in 10 C.F.R. § 50.47(b) are not significant with respect to issuance of the low-power license sought. 10 C.F.R. § 50.47(c)(1).
- (2) There is reasonable assurance of adequate protection to the health and safety of the public during fuel loading and low power testing, considering the risk to the public presented by those activities and the level of emergency preparedness in place during those activities. Consequently, with respect to the matters in controversy, the state of onsite and offsite

emergency preparedness for SONGS 2 provides reasonable assurance that adequate protective measures can and will be taken during fuel loading and low-power testing in the event of a radiological emergency as required by 10 C.F.R.

§ 50.47(a)(1).

- (3) In reaching the conclusion of law stated above, the Board considered the NRC Staff's assessment as to whether the Applicants' onsite emergency plans are adequate and capable of being implemented, and the Board also reviewed the FEMA finding and determination of July 17, 1981 with respect to the adequacy of state and local emergency preparedness for fuel loading and low-power testing as called for by 10 C.F.R. § 50.47(a)(2). The guidance contained in the Commission's September 21, 1981 Memorandum and Order [Pacific Gas and Electric Company (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-81-82] was also considered.

Prior to taking any action on the low-power motion, this Board must make additional findings pursuant to 10 C.F.R. § 50.57(c) on the matters specified in § 50.57(a) as to which there is a controversy with respect to the activities sought to be authorized. With respect to the six findings called for under § 50.57(a), only subparagraphs (2), (3) and (6) require a Board determination in the context of the matters in controversy relevant to low-power operation.

Based upon consideration of the record of the proceeding and in light of the findings and discussion contained in this Initial Decision, the Board further concludes that, to the extent relevant to the matters

in controversy, SONGS 2 will operate in conformity with the application as amended, the provisions of the Act, and the rules and regulations of the Commission; that there is reasonable assurance (i) that the activities authorized by the low-power license can be conducted without endangering the health and safety of the public and (ii) that such activities will be conducted in compliance with the regulations of the Commission; and, that issuance of the license will not be inimical to the health and safety of the public.

#### IV. ORDER

IT IS HEREBY ORDERED, pursuant to the Atomic Energy Act of 1954, as amended, and the U.S. Nuclear Regulatory Commission regulations and based upon the findings and conclusions set forth herein and in the Partial Initial Decision with respect to seismology/geology, that the Director of Nuclear Reactor Regulation is authorized, upon making the findings on all other matters specified in 10 C.F.R. § 50.57(a), to issue to Applicants Southern California Edison Company, San Diego Gas & Electric Company, City of Anaheim, California, and City of Riverside, California, a license to authorize the loading of fuel and low-power testing (up to 5 percent) for Unit 2 of the San Onofre Nuclear Generating Station.

IT IS FURTHER ORDERED, in accordance with 10 C.F.R. Section 2.764 of the Commission's Rules of Practice, that this Initial Decision shall be effective immediately and the Director of Nuclear Reactor Regulation is directed to issue a low-power license within 10 days from the date of issuance of this decision.

ATOMIC SAFETY AND LICENSING BOARD

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James L. Kelley, Esq., Chairman

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Dr. Cadet Hand, Jr.

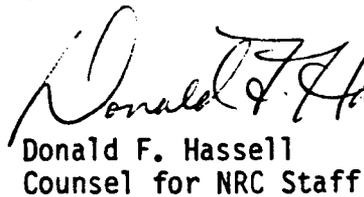
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Mrs. Elizabeth B. Johnson

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Respectfully submitted,

  
Richard K. Hoefling  
Counsel for NRC Staff

  
Donald F. Hassell  
Counsel for NRC Staff

Dated at Bethesda, Maryland,  
this 29th day of October, 1981.



10339	21	Change "719" to "7-19"
10339	23	Delete the final "e" from "consequencese"
10340	9	Change "evaluation" to "evacuation"
10342	25	Change "expect" to "expert"
10343	18	Insert "Dr. Lyon gave" between "know," and "hours"
10343	24	Delete "in a proceeding,"
10345	5	Change "into" to "him to"
10349	13	Change "he" to "they"
10351	24	Change "PWR" to "PWR-1"
10352	10	Change "PWR" to "PWR-1"
10354	7	Change "7.41" to "7.4"
10354	10	Insert "," between "included" and "and"
10354	12	Change the period after "them" to a comma
10355	17	Insert "don't" between "You" and "get"
10361	14	Insert "or" between "LPZ" and "exclusion"
10361	14	Add "boundary" after "area"
10375	10	Delete "and" between "(b)" and "(13)"
10390	20	Should read "44 CFR 350"
10413	16	Add a comma between "RAC" and "for"
10413	18	Add a comma between "process" and "reached"
10413	19	Add "I" between "and" and "then"
10413	21	Add "I" between "meeting" and "simply"
10444	4	Quotes are needed around "give the views."
10449	24	"County's" should read "counties"

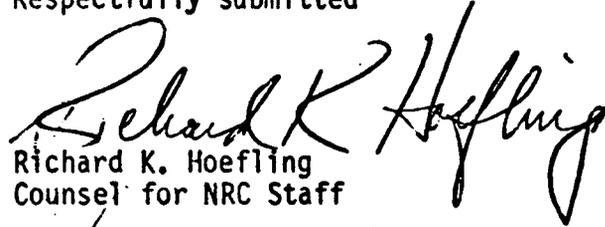
10465	12	Add "the" between "and" and "experience."
10465	12	Delete "it" after "them"
10482	12	Reverse "officially" and "it"
10504	2	Change "why" to "what"
10599	7	Change to read: "instructor in Radiological Defense Officer <u>and</u> Instructor--Workshop courses"
10621	13	Change to read: "It serves <u>no</u> purpose"
10654	15	Change "PWR 129" to PWR 1 through 9"
10684	24	Change "ground" to "round"
10686	2	Change "to our" to "two hour"
10768	15	Change "PRE" to "PRA"
10905	24	Change "can" to "would"
10933	11	Delete "that the response"
10949	16	Add "and" between "think" and "in"
10987	11	Change "does" to "do"
11324	4	Change the comma to a period. Change "for the blowdown liquid mass removed by the entrain-" to "For the blowdown, liquid mass removed by entrain-"
11324	12	Delete "was"
11324	13	Change "by the" to "a"
11330	24	Change "padding" to "adding"
11334	5	Change "on" to "one"

11336

13

Change "VWR" to "BWR"

Respectfully submitted

  
Richard K. Hoefling  
Counsel for NRC Staff



Donald F. Hassell  
Counsel for NRC Staff

Dated at Bethesda, Maryland  
this 29th day of October, 1981

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )  
 )  
SOUTHERN CALIFORNIA EDISON COMPANY, ) Docket Nos. 50-351 OL  
ET AL. ) 50-362 OL  
 )  
(San Onofre Nuclear Generating Station, )  
Units 2 and 3) )

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF'S PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW IN THE FORM OF A PROPOSED INITIAL DECISION PERMITTING FUEL LOADING AND LOW-POWER TESTING OF SAN ONOFRE NUCLEAR GENERATING STATION UNIT 2" and "NRC STAFF PROPOSED TRANSCRIPT CORRECTIONS" in the above-captioned proceeding have been served on the following by deposit in the United States mail, first class, as indicated by an asterisk through deposit in the Nuclear Regulatory Commission's internal mail system, or as indicated by a double asterisk by special messenger, this 29th day of October, 1981:

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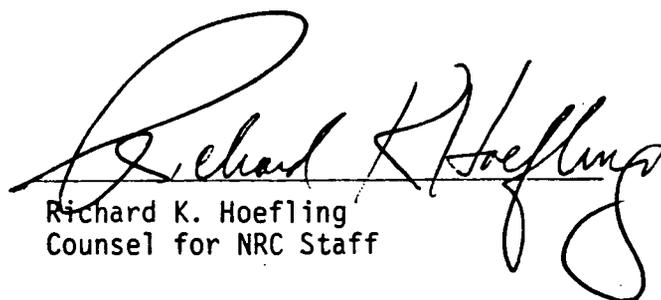
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