February 16, 1982

SECY-82-63

[illegible] ISSUE
[illegible] Vote

For: The Commissioners

From: Martin G. Malsch
Deputy General Counsel

Subject: DIRECTOR'S DENIALS OF 2.206 RELIEF (IN THE MATTER OF SOUTHERN CALIFORNIA EDISON COMPANY): DD-81-19 and DD-81-20

Facility: San Onofre Nuclear Generating Station, Unit 1.

Purpose: To inform the Commission of the denials of two requests to suspend the operating license for San Onofre Unit 1 and to recommend that

Ex. E

Review Time Expires: February 26, 1982.

Background: Since 1979 the Commission has received similar petitions from numerous California citizens to suspend or revoke the operating license for San Onofre Unit 1. The petitions reflect two primary concerns: (1) Unit 1 is not designed to withstand possible ground motions from earthquakes based on

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current information, and (2) existing evacuation plans are inadequate to cope with a potential accident. By letter of July 10, 1981, Mr. Ralph Nader also requested suspension of Unit 1's license on similar grounds pending a license review by the Commission. On November 16, 1981, the Director of Nuclear Reactor Regulation denied the California citizens' petitions as well as Ralph Nader's petition. Since both petitions and both of the Director's denials are based on similar grounds, we have consolidated them for Commission review.

Discussion:

The gist of both petitions is that San Onofre Unit 1, licensed in 1967, does not meet the seismic design criteria or the evacuation planning requirements being imposed on Units 2 and 3 in the current operating license proceeding. Of special concern is the fact that new information since 1967 regarding potential ground motion due to the Inglewood and Cristianitos faults and data from recent earthquakes in California have not been adequately assessed in NRC's seismic evaluation for Unit 1. In addition, because of rapid and extensive population growth in the vicinity of San Onofre, the petitioners believe that existing evacuation plans are no longer adequate to protect the public.

EVACUATION PLANNING CONCERNS

According to the Director's decisions, the licensee has updated its prior emergency response plan for Unit 1 (approved in 1976) in a January 1981 submittal which applies to both San Onofre 1 and 2. That plan was reviewed by the NRC and the Federal Emergency

Management Agency (FEMA) and a demonstration emergency exercise was conducted in May 1981. In a letter dated June 26, 1981, FEMA concluded that the local government emergency response plans were "minimally adequate" but found the offsite capability for implementation inadequate pending corrective action. The licensee has since undertaken to correct the deficiencies in its emergency response plans and is awaiting a final review and determination from FEMA. Based on its review of the present approved plan and licensee efforts to upgrade its emergency preparedness, the NRC staff concluded that there is no unacceptable risk to the public health and safety that would justify an order to suspend or revoke San Onofre Unit 1's license.1/ We believe that

EX. 5

One item should be noted

1/ Subsequent to the Director's Denials, FEMA has updated its evaluation and concluded that the applicant has made "great progress in addressing the corrective action items identified in the various assessments "of the plan." November 13, 1981 letter Krimm (FEMA) to Grimes (NRC).

LICENSE REVIEW

Mr. Nader also requested a license review of San Onofre Unit 1. The staff has been conducting a comprehensive review of Unit 1 under the Systematic Evaluation Program (SEP). The Director believes that the SEP seismic review essentially satisfies Mr. Nader's concerns and sees no need to suspend operation pending the completion of that review. We see no reason

SEISMIC CONCERNS

When San Onofre Unit 1 was licensed in 1967, structures, systems and components identified at that time as safety related (Seismic Category A) were built to withstand a .5g ground motion on the Housner scale. Based on a preliminary review, the staff believes that Seismic Category A structures, systems and components at Unit 1 currently have "resistance capacities in excess of

those required to meet 0.67g Housner Spectra." (Safety Evaluation Report, p. 5). However, when Unit 1 was licensed the turbine building and its extensions were not classed as safety structures, and were only built to withstand a .2 g static criterion. (Seismic Category B) The staff calculates that portions of the complex, including the North Turbine Building Extension, actually have the capability to withstand earthquakes of about a 0.4g Housner level. However, the turbine building complex contains systems and components necessary for safe shutdown and accident mitigation, and the staff is now requiring the licensee to upgrade two portions of the turbine building, the North Extension and the West Heater Platform, to meet the .67g Housner Spectrum standard by June 1, 1982 or the plant must be shut down until the upgrading is completed. As noted in the SER (p. 18) accompanying the denials, the licensee was also required to submit for NRC review by January 31, 1982, results of the seismic analyses of the structures. The remainder of the seismic analyses for systems and components are to be supplied on a phased schedule. Any modifications found to be necessary as a result of these seismic analyses which are not implemented by January 1, 1983, are to be justified on a case-by-case basis with a schedule for implementation.

The Director's denial justified continued operation during the interval from November 1981 to June 1982 on the basis of the staff's judgment that the chance of ground motion exceeding the 0.4g Housner spectrum and causing a significant radiological release is low. The probability of ground motion exceeding the 0.4g Housner spectrum has been estimated to lie in the range from 1×10^{-4} to 7×10^{-3}. (SER, accompanying DD-81-19, p. 4). The SER notes that for the same interval the probability of a magnitude 7.0 or greater earthquake (the SSE for San

Onofre) occurring on the OZD in the site vicinity has been estimated to be of the order of 10^{-4} to 10^{-3} and the referenced level of ground motion is at about the median level that could be expected from such an earthquake; i.e. 50% of the time ground motion of a magnitude 7.0 earthquake at San Onofre would exceed 0.4g Housner. The SER does not define the criteria used by staff to determine "low". It appears to us that the chance of ground motion exceeding the 0.4g Housner spectrum was just one factor in the staff's judgment that the likelihood of a significant earthquake-caused release is "low". Ultimately whether the likelihood is sufficiently low or well known to permit continued operation of Unit 1 is a safety policy issue that depends importantly on engineering judgment.

Because of the technical nature of the seismic questions raised by the petitions, we have asked OPE to review the technical bases for the director's decisions. OPE believes that

EX 5

Recommendation: Ex. 5 Based on the above considerations, we recommend that

Martin G. Malsch
Deputy General Counsel

Attachments:

1) Director's Denial DD-81-19
2) November 14, 1979 Petition from California Citizens
3) Director's Denial DD-81-20
4) July 10, 1981 Ltr from Ralph Nader

Commissioners' comments should be provided directly to the Office of the Secretary by c.o.b. Friday, February 26, 1982.

Commission Staff Office comments, if any, should be submitted to the Commissioners NLT February 19, 1982, with an information copy to the Office of the Secretary. If the paper is of such a nature that it requires additional time for analytical review and comment, the Commissioners and the Secretariat should be apprised of when comments may be expected.

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P21.

ATTACHMENT 1

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION
HAROLD R. DENTON, DIRECTOR

In the Matter of	)	
	)	
SOUTHERN CALIFORNIA EDISON COMPANY	)	Docket No. 50-206
	)	(10 CFR 2.206)
(San Onofre Nuclear Generating Station, Unit 1)	)	
	)	

DIRECTOR'S DECISION UNDER 10 CFR SECTION 2.206

By essentially identical petitions received since November 1979 (44 FR 75535, December 20, 1979), approximately 1560 residents of California requested that the Nuclear Regulatory Commission's (NRC) Director, Office of Nuclear Reactor Regulation, suspend or revoke the operating license for the San Onofre Nuclear Generating Station, Unit 1. By letter dated July 10, 1981, Mr. Ralph Nader also requested that operation of San Onofre Unit 1 be suspended pending completion of a "license review" for the facility. The petitions and Mr. Nader's letter have been considered under 10 CFR 2.206 of the Commission's regulations. However, we have responded to Mr. Nader's request in a separate decision under 10 CFR 2.206.

The asserted bases for the request by the petitioners are that San Onofre Unit 1 is not designed to withstand possible ground motion from earthquakes that may occur and that evacuation plans are inadequate to cope with a potential accident at the site. The licensee responded to the petition in a filing dated January 23, 1980. Also, in an updated version of the petition distributed by the Alliance for Survival in 1980, the petitioners expressed additional

seismic concerns in light of the Livermore earthquake of January 1980. The updated petition also pointed out that the Rogovin Report to the Nuclear Regulatory Commission on the Three Mile Island accident recommended that old reactors near major cities be shut down until realistic evacuation plans are available for use.

I have reviewed the information submitted by the petitioners and other relevant information bearing on the issues addressed in the original and updated petitions. For the reasons set forth below, the petitioners' request that the operating license for San Onofre Nuclear Generating Station Unit 1 be suspended or revoked is denied.

I.

With respect to the issues of the seismic capability of San Onofre Unit 1 the petitioners assert that: (1) San Onofre Unit 1 is not designed to withstand possible ground motions from earthquakes on the Newport-Inglewood ard Christianitos (sic) faults and their branches which pass close to the reactor, (2) these ground motions could break cooling water pipes, cause a loss-of-coolant accident and lead to a meltdown of the fuel rods, (3) the addition of a concrete shell to the reactor dome and other modifications are inadequate to ensure against damages from possible ground motions during a maximum possible earthquake, (4) new and relevant information regarding ground motion potential was unavailable when the Atomic Energy Commission (AEC)* approved the design criteria for

*The NRC's predecessor

Unit 1 and these criteria were based on inadequate data on measurements for ground motions close to the source of the earthquakes, and (5) The Livermore earthquake of January 1980 made seismic focusing an issue relevant to San Onofre's earthquake hazards.

The San Onofre Unit 1 was licensed by the AEC on March 27, 1967. In the original seismic design, all components, systems and structures which were designated as important to the nuclear safety of the plant were designated Seismic Category A. The design basis used for Seismic Category A was what in today's terminology would be consistent with a 0.25g Housner Spectrum defined Operating Basis Earthquake (OBE) and a 0.5g Housner defined Safe Shutdown Earthquake (SSE). Specifically, structures, systems and components associated with the reactor coolant system, boron injection and residual heat removal were designed as Seismic Category A. Safety injection system components were also designed as Seismic Category A. The Turbine Building extensions were designated Seismic Category B and designed to a 0.2g static criteria.

Since the original plant was constructed, various structures and systems have been added to the plant. These new items were designed to higher seismic levels. Specifically, the sphere enclosure building and the diesel generator and its associated structures, system and components were designed to a 0.67g modified Newmark response spectrum.

In 1973, Southern California Edison Company (SCE) (the licensee) initiated a program to reevaluate and modify as necessary the capability of San Onofre Unit 1 to withstand seismic events. The criterion for this program

the 0.67g Housner response spectrum. The first phase of this program consisted of reevaluating (1) systems to prevent a design basis accident, including the main reactor coolant loop, Nuclear Steam Supply System (NSSS) components and the reactor building and (2) the major structure in mitigating a design basis accident, the containment. Based upon its reanalyses, the licensee concluded for the containment sphere, the reactor building and structural steel framing that these structures have resistance capacities in excess of those required to meet 0.67g Housner Spectra. As a result, modifications were not necessary. While we have not completed our review of these reanalyses, our preliminary review indicates that these results appear reasonable and are consistent with results from audit analyses performed by NRC of similar structures at other Systematic Evaluation Program (SEP) plants. However, additional restraints were required for several of the larger NSSS components which were base supported. These modifications were implemented during an outage in 1976-1977.

Following initiation of the SEP in 1978, subsequent phases of the seismic reevaluation program were incorporated into the SEP. This program is proceeding in three phases: (1) reevaluation of balance-of-plant structures; (2) reevaluation of piping and mechanical equipment required to shut down the plant; and (3) reevaluation of piping and mechanical equipment required to mitigate accidents. The earthquake input being used for this program is the 0.67g Housner response spectrum.

Portions of the Turbine Building Complex were originally designed as Category B structures (0.2g Static) yet they contained systems and components necessary for safe shutdown and accident mitigation, i.e., Category A systems and components. As discussed in our attached Safety Evaluation Report (SER)

two parts of the Turbine Building Complex (the North Extension and West Heater Platform) require upgrading on a priority basis. The licensee has agreed to implement appropriate modifications to these structures to increase their capacity to resist earthquakes or to shut down the plant if modifications are not complete by June 1, 1982. In the interim the staff concludes that the North Turbine Building Extension, based upon recent modifications to upper column to girder connections, has the capability to resist earthquakes of about 0.4g Housner.

The NRC staff issued letters dated August 4, 1980 and April 24, 1981 to SCE requesting details of the seismic reevaluation program including the scope of review, the evaluation criteria, the schedule for completion and justification for continued operation in the interim until completion of the seismic reevaluation program. The licensee responded by letters dated September 24, 1980, February 23, April 24, July 7, August 11, September 28, October 5, 1981 and October 19, 1981. In addition, on June 1 through June 3, 1981 the NRC met with SCE at San Onofre Unit 1 to review the seismic analyses program for the auxiliary feedwater system.

The NRC staff has evaluated the licensee's responses and has prepared a Safety Evaluation Report of the Interim Seismic Adequacy for San Onofre Unit 1. This report addresses the licensee's conclusion that continued operation is acceptable in the interim until the seismic reevaluation, and any necessary upgrading, is complete. A copy of the Safety Evaluation Report of the Interim Seismic Adequacy for San Onofre Unit 1 is attached to this decision and is hereby incorporated by reference.

The response to the petitioner's allegations (issues 1, 4 and 5) concerning the ground motions from the maximum earthquake on the Newport-Inglewood and Cristianitos faults, new information on ground motions, and near field effects are as follows:

The geologic and seismologic investigations and reviews for the San Onofre Nuclear Generating Station (SONGS) site are among the most extensive ever conducted for nuclear power plants. This effort has included seismologic and geologic studies of Southern California and Baja California in general and specific studies related to the immediate site vicinity. See NUREG-0712, "Safety Evaluation Report for San Onofre Units 2 and 3".

The Offshore Zone of Deformation (OZD) is about 8 km from the SONGS site at its closest approach to the site. The maximum earthquake on the OZD was determined from historic data and instrumentally recorded seismicity and from fault parameters, including slip rate, fault length, and fault area. The vibratory ground motion at the site due to the occurrence of the maximum earthquake on the OZD was determined by the use of empirical methods, theoretical models, and an examination of recent recordings of strong ground motion from earthquakes.

The seismic record in the Southern California region extends back to the 18th century. From 1932 to the present a relatively complete listing of instrumentally determined earthquakes is available. Listing of earthquakes of Richter Magnitude 5 or greater within 320 km of the site and all listed earthquakes within 80 km of the site, for which instrumental records are available, were reviewed. The spatial density of these events varies with location. The vicinity of the SONGS site (within approximately 30 km) appears to be one of relatively low seismicity.

The areas of Southern California which might be characterized as seismically active are the San Jacinto, San Fernando, White Wolf, and Imperial Valley faults. These faults are in the range of 80 km to 240 km from the SONGS site at their closest approach and, therefore, are considered to present no significant seismic challenge to the plants.

The Newport-Inglewood Fault is approximately 35 km northwest of the SONGS site at its closest approach to the site. As a conservatism in estimating the maximum earthquake to be expected on the OZD, the staff considers the Newport-Inglewood fault, the Southcoast Offshore Zone of Deformation and the Rose Canyon fault as one continuous zone of deformation.

The licensee and the NRC staff have spent several years conducting exhaustive investigations and reviews of the geology and seismology of southern California and particularly the SONGS region to determine the proper earthquake parameters.

For safe-shutdown, the Category A systems, components and structures at SONGS Unit 1 are designed to a Housner spectrum anchored at zero period by an acceleration of 0.5g. This design significantly exceeds the ground motion expected from a magnitude 5 earthquake at a distance of 8 km. In addition, San Onofre Unit 1 is presently being backfitted to increase its margin of safety with respect to an M_s (surface wave magnitude) = 7 earthquake on the OZD.

Although not identified as the Cristianitos Zone of Deformation (CZD), a feature aligned along the CZD known as Fault E, which is not part of the present day mapped Cristianitos Fault, was identified and mapped in 1971 by Marine Advisors Associates, consultants to the Southern California Edison Company. The fault was removed from their 1972 maps because further interpretation did not substantiate a continuous fault, but rather a discontinuous zone of deformation.

A detailed investigation was made in 1980 by Southern California Edison at the request of the NRC, assisted by the U. S. Geological Survey (USGS), to determine the offshore extent of the Cristianitos Fault and to determine whether it is structurally related to the Offshore Zone of Deformation (OZD) of which the Newport-Inglewood fault is a part. The closely spaced, high resolution seismic reflection profiles taken offshore of the SONGS site revealed a zone of discontinuous, en-echelon faults and folds which were collectively referred to as the CZD. The CZD is not seen in the sea cliff exposure along its projected trend. Also, a Pleistocene erosion platform, which is believed to be 40,000 to 80,000 years old, can be seen in the seismic reflection profiles to overlie, undisturbed, the CZD. Since this would indicate that the CZD has not moved for at least that period of time, it is considered to be noncapable and does not present a hazard to the SONGS site. (See NUREG-0712, Section 2.5.1.12).

With respect to issues (2) and (3) concerning breakage of water pipes and damage from an earthquake, the petition failed to state specifically the basis for the allegations of the inadequacy of the Unit 1 facilities. To address issues (2) and (3), the staff has examined information regarding the possible effects of seismic events on plant structures and safety systems. In its letter dated August 11, 1981, the licensee enclosed a summary of the performance of steel-framed structures in six past earthquakes dating from 1952 through 1979 and including the largest recorded earthquake in modern times. The licensee noted that, in general, the steel framed structures reviewed were designed for 0.1g or 0.2g static (the turbine building extensions are steel framed structures designed for 0.2g static) and experienced two to three times the design acceleration level without significant damage. In the large number of structures reviewed, which had experienced severe ground motion, no plastic collapse or other gross structural failure was found.

Our basis for allowing continued operation of the San Onofre Unit 1 facility, pending completion of the seismic reevaluation program, is described in detail in Section III, "Seismic Resistance of Structures, Systems and Components", Section IV, "Seismic Reevaluation Program", and Section V, "Conclusion", of the attached Safety Evaluation Report.

As discussed in the Safety Evaluation Report, significant seismic upgrading of the San Onofre Unit 1 facility is underway, much has been accomplished and more is scheduled. The staff also agrees with the licensee's April 28, 1980 basis for continued operation for those structures, systems and components which were originally designed to meet a 0.5g Housner Spectra as ground motion input.

However, not all safety related structures and systems were designed to this level of ground motion. In particular two critical areas of the Turbine Building complex (North Extension and West Heater Platform), several masonry walls and the Auxiliary Feedwater System are in this category. It is the NRC's judgment that the inherent seismic capability of the AFW system and the additional water supply that bypasses the normal suction piping provide an adequate basis for continued operation during the seismic reanalysis and upgrading of the Auxiliary Feedwater System. Based on our review to date, we consider the masonry walls have adequate seismic resistance, although spalling and rebar overstraining may be expected to occur at levels somewhat below the 0.67g Housner Spectra used by the licensee in his analyses. Our evaluation of the North Turbine Building Extension and the West Feedwater Heater Platform indicate an inherent capacity to withstand seismic events in excess of the original design (0.2g Static). The staff estimates that the North Turbine Building Extension would have the capacity to withstand an earthquake input level of 0.4g Housner.

The staff has concluded that certain modifications to (1) the North Turbine Building Extension and (2) the West Feedwater Heater Platform are necessary in the near term to increase the capability of certain plant structures to resist earthquakes at SONGS 1 to assure that continued operation of the facility is not inimical to the health and safety of the public.

For the reasons discussed in Section II.B., Near-Term Seismic Hazard, of the attached Safety Evaluation Report the probability is low that ground motion at the reactor site greater than that characterized by 0.4g Housner Spectrum would be exceeded. Therefore, considering the plant's ability to resist strong ground motion, as discussed in Section III of the attached Safety Evaluation Report, Seismic Resistance of Structures, Systems and Components, and considering the low probability of the ground motion discussed above until June 1, 1982; the staff concludes that short term operation of San Onofre Unit 1 during the seismic reevaluation of the facility and the implementation of any modification shown to be necessary as a result of seismic reanalysis is acceptable under the following conditions:

(1) Structural upgrading of the North Turbine Building Extension and West Heater Platform by adding diagonal steel bracing is to be completed by June 1, 1982, or the facility is to be shutdown, until such upgrading is completed;

(2) Results of seismic analysis of structures are submitted for NRC review by January 31, 1982, and for all other items on the schedule specified in the licensee's November 3, 1981 letter;

(3) Any modifications shown to be necessary as a result of the seismic analysis which are not implemented by January 1, 1983, are justified on a case-by-case basis with a schedule for implementation; and

(4) Prior to upgrading of the North Turbine Building Extension and West Heater Platform, either the gantry crane is to be parked at the extreme south limit of travel or the reactor is to be shut down during periods when crane movement is required.

II.

With respect to the issue of the evacuation plans for San Onofre Unit 1 the petitioners assert: (1) because the population growth near San Onofre Unit 1 plant has been more rapid and extensive than could have been anticipated during the licensing of Unit 1, there are no adequate evacuation plans for the area's residents in the event of a loss of coolant accident; (2) there are about nine million people that live in the area that could be affected by accidental release of radioactive gases from Unit 1; (3) the State and local governments are not prepared to evacuate the population within the short time between the accident and the spread of radioactive gases; (4) when the AEC issued the construction permit in March 1964, it was impossible to know that the population would increase so rapidly; and (5) the Rogovin Report to the NRC on the Three Mile Island accident recommended that older reactors near major cities (like San Onofre 1) should be shutdown until realistic evacuation plans are developed.

Presently, the licensee has in place an NRC approved (October 1976) emergency plan for San Onofre Unit 1, which includes planning provisions for both onsite and offsite and, contrary to the petitioners contentions 1 and 4, accounts for population growth since the issuance of the construction permit for Unit 1 in 1964. A new proposed regulation was published in the Federal Register (44 FR 7516) on December 19, 1979, to clarify, expand, and further upgrade NRC's emergency planning regulations in 10 CFR Part 50, Appendix E. After public comments were received, a new regulation was issued with an effective date of November 3, 1980. In compliance with this regulation, the licensee submitted an updated emergency plan for NRC review in January 1981.

In addition, contrary to petition contention 3, the licensee submitted to the Federal Emergency Management Agency (FEMA), with copies to NRC, emergency plans for Orange and San Diego Counties, the cities of San Clemente and San Juan Capistrano, the U. S. Marine Corps at Camp Pendleton, and the California State Department of Parks and Recreation.

The new regulations require 10 mile radius emergency planning zones around nuclear power plants. The 10 mile radius area is referred to as the plume exposure pathway Emergency Planning Zone (EPZ) and applies to potential airborne exposure. Within the EPZ the resident population estimates are approximately 80,000 in 1980 and 98,000 in 1990 contrary to petitioners' contention 2. Its size is based on a conclusion that it is unlikely that any protective actions would be required beyond the plume exposure pathway EPZ, even for most core-melt accidents. In addition, for worst-case core-melt accidents, acute fatalities would not be expected outside 10 miles. The detailed planning basis for this EPZ is described in the NRC/FEMA Report, NUREG-0396, EPA 520/1-78-016, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants". The planning basis is also described in NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants."

A report by Science Applications, Inc. (SAI) was done for the California legislature and is the basis for a recommendation by the California Office of Emergency Services (COES) for extended emergency planning zones larger than the 10 mile EPZ. The risk study performed for the State of California is similar in many respects to those studies that were the basis for NUREG-0396, but one of the most important differences was the COES assumption that no

protective actions would be taken offsite for seven days for those individuals in local areas of high radiation after cloud passage. The staff believes that a more realistic exposure time is considerably shorter and that correspondingly smaller planning distances should result from use of the COES Methodology. The staff, however, has no objection to offsite authorities laying explicit plans for distances farther than 10 miles if those authorities choose to expend resources for this purpose. The NRC's conclusion is that evacuation plans for the population beyond the 10 mile EPZ are not required and that evacuation plans within the 10 mile EPZ are adequate.

An emergency exercise was enacted May 13, 1981 to demonstrate the Emergency Plan at SONGS. This exercise was witnessed by the NRC and FEMA and in a June 3, 1981 memorandum from FEMA to the NRC, FEMA states, in part, that:

> "A joint exercise was conducted on May 13, 1981, to evaluate the offsite capabilities of the State and local jurisdictions to respond to a nuclear emergency at the San Onofre station. The exercise reflected a general overall state of preparedness to implement general emergency plans."

In an enclosure to that memorandum, it is further stated that:

> "On May 13, 1981, FEMA Region IX with support from FEMA headquarters, Regions VIII and X, and the RAC conducted an evaluation of the offsite capabilities of the local and State jurisdictions to respond to a nuclear emergency at SONGS. The evaluation preparation, conduct, and subsequent critique process, closely followed guidance provided by FEMA National Program Office. The findings of that evaluation reflected a general overall preparedness to implement their plans and to respond to the scenario from an operational standpoint, but significant shortfalls were observed in the ability to conduct radiological response operations. Further, the critical areas of ingestion pathway sampling and analysis, as well as Reentry and Recovery operations were not observed due to the restricted nature of the scenario. Communications, EOF facility, and general coordination were also considered to be weak and needed further address through training and drill efforts. The evacuation portion of the exercise was considered adequate but was felt it did not totally test the evacuation requirement and, therefore, refelected a need for further study, drill and exercise."..."A range of protective actions has been

developed for the plume exposure pathway EPZ for both emergency workers and the public. Guidelines for the choice of protective actions during an emergency are developed and in place. Protective actions for the ingestion exposure pathway EPZ, appropriate to the locale, are generally developed. Further development and testing of these guidelines is recommended, but do not impose an impediment to the total response capability."

In summary, FEMA found the state and local government emergency response plans "minimally adequate", but found the offsite capability for implementation inadequate pending taking of corrective actions. In a letter dated June 26, 1981, to the NRC, SCE stated that a series of meetings had been held with FEMA and with all local jurisdictions to develop a plan of action for the continuing development of emergency preparedness. The plan and its schedule for implementation are described in Appendix A. FEMA, in a July 14, 1981 memo from R. Jaske to B, Grimes of the NRC, states that they have confirmed with FEMA Region IX that SCE's letter of June 26, 1981, represent agreed positions concerning FEMA's major concerns, what needs to be done to correct them, and SCE's proposed actions to assist in correcting them. The NRC staff has reviewed the corrective action proposed by the licensee to address the FEMA determinations and concluded that when completed these actions will adequately resolve the expressed concerns. Accordingly, in an October 26, 1981 letter the NRC advised SCE that the deficiencies identified by FEMA must be resolved and SCE must clearly demonstrate that the deficiencies have been corrected before the staff can complete its assessment of the overall state of emergency preparedness with respect to Unit 1. SCE forwarded to FEMA a letter dated October 15, 1981, showing the completion of all items identified earlier. FEMA is reviewing this letter and expects to make a final determination in mid November, 1981. In view of the NRC staff's previous

evaluation of the current emergency plan, the present efforts to further upgrade the emergency preparedness at San Onofre, and the schedule to meet FEMA's concerns in the near-term, there is no unacceptable risk to the health and safety to the public that would justify an order to shut down San Onofre Unit 1.

III.

On the basis of the foregoing, I have determined that no adequate basis exists for ordering the suspension or revocation of the operating license for the San Onofre Nuclear Generating Station Unit 1. Consequently, the petitioners' request is denied.

A copy of this decision will be filed with the Secretary for the Commission's review in accordance with 10 CFR 2.206(c). As provided in this regulation, the decision will become the final action of the Commission twenty-five (25) days after issuance, unless the Commission, on its own motion, institutes review of the decision within that time.

Harold R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland,
this 16th day of November, 1981

Attachment:
1. Appendix A - Corrective Actions Required to Address FEMA Determinations of 6/3/81
2. Safety Evaluation Report of the Interim Adequacy for San Onofre Unit 1

APPENDIX A

CORRECTIVE ACTIONS REQUIRED TO ADDRESS FEMA DETERMINATIONS OF JUNE 3, 1981*

FEMA CONCERNS	FEMA RECOMMENDATION	RESPONSE**
FEMA Region IX Evaluation of Plans and Capabilities		
"Most Critical Concern"		
1. The assessment and monitoring of actual offsite radiological consequences of a radiological emergency condition through methods, systems and equipment is considered to be weak and in need of improvement to meet minimum criteria.	Develop a multi-jurisdictional response capability to assure adequate coverage of plume pathway and standardized procedures which allow flexibility in response.	Continue to install the Health Physics Computer which will provide a prompt conservative assessment of the actual radiological consequences of an accident. This will be operational to a limited degree by fuel load with full operation expected by July 1982. Further develop standard radiological monitoring procedures (SOP's) for the local jurisdictions and the Offsite Dose Assessment Center (ODAC) by August 1981. SCE additionally will assess the local jurisdictions' current equipment against their needs and identify any deficiencies noted. SCE will provide staffing to assume a role of leadership in this function. SCE will provide training programs for personnel involved in use of the SOP's.
"Serious Concern"		
2. The interim - EOF shows a lack of clear operating procedures, fragmentation of the facility, lack of management direction communications, size of the facility, and is a significant impedance to the San Clemente EOC operation.	Until the permanent EOF is completed, the interim EOF should be relocated to a single location separate from the San Clemente EOC and staffed with management, communicators and other support personnel necessary for EOF operations.	SCE will develop SOP's to make current EOF operations clearer and more manageable along the lines of the current planning arrangements. Limited physical improvements of the present facilities will be identified and accomplished.

*The schedule for these actions is identified in pages A-4 and A-5.

**As a result of a meeting between FEMA and SCE on June 15, 1981, it is SCE's understanding that the significant concerns addressed in the FEMA Region IX Evaluation of the May 13, 1981 Exercise are covered in these planned actions.

FEMA CONCERNS	FEMA RECOMMENDATION	RESPONSES
"Major Concerns"		
3. A need to clarify monitoring and assessment duties for both plume and ingestion pathways as they pertain to State OES, State Radiological Health and local jurisdiction.	Develop a joint standardized multi-jurisdictional response team.	(See item [1] above.) SCE will develop standardized procedures for the five involved counties to obtain samples, conduct analyses, and take necessary protective actions for the ingestion pathway emergency planning zone consistent with the State Radiological Health proposed ingestion pathway procedures. Develop an integrated radiological response team to be directed by the Offsite Dose Assessment Center (ODAC) to conduct field monitoring.
4. Means to provide early notification and clear instructions to the public within the plume exposure pathway EPZ have not been installed or tested.	Install sirens and provide warning dissemination capacity to remote areas where public address systems from surface or airborne vehicle is required.	SCE will proceed with current plans for siren installation. SCE will develop SOP's for public notification via the Emergency Broadcast System (EBS) and local stations identified in the plans. SCE will develop SOP's for coordination and decisionmaking in use of sirens.
5. Adequate emergency facilities and equipment to support the emergency response have not been provided.	SCE provide response equipment which was promised to the local jurisdictions, including sirens and additional communications equipment.	Agreements have been made between SCE and local agencies that specific equipment will be ordered by the local jurisdictions and billed to SCE. Equipment procurement has begun and is continuing. SCE will follow up with report on status of equipment received or on order. SCE will review equipment needs and status of equipment procurement activities.
6. Radiological emergency response training has essentially not been provided to those who may be called upon to assist in an emergency.	SCE, in conjunction with the State of California, should develop the necessary training to meet the identified needs in the local jurisdictions.	(See items [1] and [3] above.) SCE will develop and implement a program of training in the critical areas of radiation monitoring and assessment, communications, decisionmaking and coordination regarding protective actions, etc.

FEMA CONCERNS	FEMA RECOMMENDATION	RESPONSES
"Sufficient Concern to Remain a Major Issue"		
7. SCE has not made information available about how the public would be notified or what the public's initial actions should be in an emergency.	Disseminate advance public information.	SCE will proceed with the public education program that includes an emergency response brochure and radiation information brochure mailer, preparation and distribution of flyers and posters, new ads, community meetings, etc.

SUMMARY OF PLANNED ACTION

	SCHEDULE
	Items (a) through (h):
1. Develop SOP's covering the following topics:	1st draft - 7/15/81 Final draft - 9/1/81 Implement - 10/1/81
a. Operation of the Offsite Dose Assessment Center (ODAC)	
b. Radiation surveys by field monitoring teams	
c. Emergency Communications	
d. Use of the siren alerting system and public notification	
e. Coordination relating to protective actions	
f. Acquisition, display and use of meteorological data	
g. Operation of the EOF	Item (i):
h. Ingestion pathway monitoring	1st draft - 9/15/81 Final draft - 11/1/81 Implement - 12/1/81
i. Existing SOP's covering other plan elements	
2. Obtain equipment required to carry out radiation monitoring functions	
a. Survey types and quantities of equipment actually in place	7/15/81
b. Initiate procurement of equipment shortages	8/1/81
3. Develop additional communications capability	
a. Expand interagency phone network to include CHP	7/15/81
b. Provide speaker monitors at EOC's	7/15/81
c. Provide teletype message system network between all principal centers	10/15/81
d. Provide additional communication circuits	10/15/81

		SCHEDULE
4.	Make physical improvements to the EOF	
	a. Identify possible improvements	9/1/81
	b. Obtain agreements to make improvements	9/1/81
	c. Construct improvements	10/15/81
5.	Install Sirens	50% by 7/1/81 90% by 9/1/81 100% by 10/15/81
6.	Accomplish training in use of new and existing procedures, facilities, and equipment	
	a. Develop training program (long and short term)	7/15/81
	b. Develop training material (short term program)	9/1/81
	c. Conduct training and drills (short term program)	9/1/81 through 10/15/81
	d. Implement long term training program	11/1/81 through 2/1/82
7.	Public Information Program	Ongoing, Initial program complete 9/1/81

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

'82 JAN 12 A10:20

COMMISSIONERS:

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Victor Gilinsky
Peter A. Bradford
John F. Ahearne
Thomas M. Roberts

In the Matter of

SOUTHERN CALIFORNIA EDISON COMPANY
(San Onofre Nuclear Generating Station, Unit 2)

Docket No. 50-206
(10 CFR 2.206)

ORDER

Pursuant to 10 CFR 2.772, the time within which the Commission may act to review the Director's Decision on a petition from Ralph Nader, DD-81-20, is extended until February 5, 1982.

It is so ORDERED.

For the Commission

SAMUEL J. CHILK
Secretary of the Commission

Dated at Washington, D.C.
this 11th day of January, 1982.

D502
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

OFFICE OF NUCLEAR REACTOR REGULATION

SAFETY EVALUATION REPORT

SAN ONOFRE UNIT 1

INTERIM SEISMIC ADEQUACY

DOCKET NO. 50-206

Dated: November 16, 1981

SAFETY EVALUATION REPORT

SAN ONOFRE UNIT 1
INTERIM SEISMIC ADEQUACY
DOCKET NO. 50-206

I. INTRODUCTION

In accordance with 10 CFR 50.54(f) of the Commission's regulations, letters were issued on August 4, 1980 and April 24, 1981 to Southern California Edison Company requesting that the licensee:

1. submit details of a seismic reevaluation program plan addressing the scope of review, evaluation criteria and a schedule for completion; and

2. provide justification for continued operation in the interim until the program is complete.

In its response to both letters the licensee referenced its April 28, 1980 submittal (Reference 1) as its basis for continued operation in the interim until the program is complete.

On June 1 through ~~June 3~~, 1981 the NRC and its consultants met with Southern California Edison (SCE) and their consultants relative to NRC sponsored seismic analyses of the San Onofre Unit 1 auxiliary feedwater system. At this meeting SCE provided drawings of preliminary modifications required to upgrade the four Turbine Building Extension structures and masonry walls to a level of earthquake resistance consistent with 0.67g Housner Spectra as input.

Based upon the extent of these proposed modifications, and the potential consequences on plant safety of structural failure of either the North Turbine Building Extension or the West Feedwater Heater Platform, our detailed review of the seismic resistance of these structures was expedited.

In their July 7, 1981 letter, the licensee committed to upgrade the North Turbine Building Extension and West Feedwater Heater Platform, if possible, during the outage following six effective full power months of operation or at the next extended outage after completion of detailed design of these modifications. In an August 11, 1981 letter the licensee committed to complete these modifications by June 1, 1982. Subsequently, they committed that should the modifications not be complete, they would shut down the facility until the modifications are complete. The licensee also provided a detailed evaluation of these Turbine Building structures to support continued operation until June 1, 1982.

II. Seismic Hazard Considerations

A. Geology and Seismology

The geologic and seismologic investigations and reviews for the San Onofre Nuclear Generating Station (SONGS) site are among the most extensive ever conducted for nuclear power plants. This included seismologic and geologic studies of Southern California and Baja California in general and specific studies related to the immediate site vicinity.

The Offshore Zone of Deformation (OZD) is about 8 km from the SONGS site at its closest approach to the site. The maximum earthquake on the OZD was determined from historic data and instrumentally recovered seismic activity and from fault parameters, including slip rate, fault length and fault area.

The vibratory ground motion at the site due to the occurrence of the maximum earthquake on the OZD was determined by the use of empirical methods, theoretical models and an examination of recent recordings of strong ground motion from earthquakes.

The seismic record in the Southern California region extends back to the 18th century. From 1932 to the present a relatively complete listing of instrumentally determined earthquakes is available. Listings of earthquakes of Richter Magnitude 5 or greater within 320 kilometers of the site and all listed earthquakes within 80 kilometers of the site, for which instrumental records are available, were reviewed. The spatial density of these events varies with location. The vicinity of the SONGS site (within approximately 30 km) appears to be one of relatively low seismicity.

Based upon its evaluation for the SONGS Units 2 and 3 the staff concluded that an appropriate representation of the maximum earthquake on the OZD to be used in determining the safe shutdown earthquake (SSE) at SONGS is Magnitude, Ms = 7.0. The SONGS Units 2 and 3 design actually exceeds a conservative representation of the ground motion expected from an Ms = 7.0 earthquake at a distance of 8 km.

The NRC by letter dated August 4, 1980 directed the licensee to conduct a seismic reevaluation of San Onofre Unit 1 using 0.67g Housner Spectra as the appropriate free field ground motion for the Safe Shutdown Earthquake (SSE). Based upon our continuing review of the final free field ground motion, the level will be no less than 0.67g Housner Spectra and no greater than 0.67g Modified Newmark-Hall Spectra. The design bases for San Onofre

Units 2 and 3 are the 0.67g Modified Newmark-Hall Spectra. The range between the two spectra is narrowly centered about 0.67g at very short periods (approximately less than 0.05 sec.) and diverge to a larger extent as the period increases. The basis for the conservatism of the 0.67g Modified Newmark-Hall Spectra is contained in the NRC's Safety Evaluation Report (SER) on Geology and Seismology for San Onofre Units 2 and 3, NUREG-0712 (Reference 2). Our evaluation contained in Reference 2 addresses the seismic hazard at the San Onofre site.

The NRC letter dated March 15, 1981 confirmed our earlier direction to the licensee to proceed with the seismic reanalysis of San Onofre Unit 1 using the 0.67g Housner Spectra pending NRC approval of the final spectra. If the appropriate ground motion for reanalysis is not the 0.67g Housner Spectra, the staff will evaluate the margins that exist in the structures, systems and components to determine if additional reanalysis using a higher spectra shape is necessary. The licensee has agreed in a letter dated May 11, 1981 to continue reanalysis effort using the 0.67g Housner Spectra.

- The staff expects to reach a final decision on the San Onofre Unit 1 spectra reanalysis following the Atomic Safety and Licensing Board's Partial Initial Decision on San Onofre Units 2 and 3 with respect to geology and seismology issues.

B. Near Term Seismic Hazard

The staff has considered probabilistic estimates of earthquake occurrence and ground motions exceedance at and in the vicinity of the San Onofre site. These include:

1. "Development of Instrumental Response Spectra with Equal Probability of Exceedance for Unit 1," Woodward-Clyde Consultants, April 18, 1980 - Submitted to NRC by letter dated April 28, 1980.

2. A survey of probabilistic estimates of earthquake occurrence and ground motion exceedance at and in the vicinity of the San Onofre site presented to ACRS by the staff on January 31, 1981.

3. "Probability of Exceedance of 0.5g Housner Response Spectrum," submitted to NRC by letter dated October 19, 1981.

In addition, the staff has also utilized the extensive review of theoretical and empirical studies regarding earthquake ground motion at the San Onofre site conducted for the San Onofre Units 2 and 3 Operating License and summarized in the Safety Evaluation Report (NUREG-0712). Examination of the above with respect to the ground motion level defined by the Housner Spectra in the period range of 0.5 to 0.6 seconds at 4% damping indicate the following:

a. Estimates of the probability of exceeding this level of ground motion at or in the vicinity of the San Onofre site in a period of 8 months range from approximately 7×10^{-3} to 1×10^{-4}. The most detailed of these estimates were conducted by Woodward-Clyde Consultants for the site. The most recent study which takes into account new data and/or weighting procedures yields the lowest estimates (3×10^{-4} to 1×10^{-4}).

b. The Safe Shutdown Earthquake (SSE) for the San Onofre site as found in the staff Safety Evaluation Report for Units 2 and 3 is a magnitude 7.0 occurring on the offshore zone of deformation (OZD) approximately 8 kilometers from the site. Estimates of the probability of this event are of the order of 10^{-3} to 10^{-4} for this period. Our examination of the various techniques used to estimate the ground motion deterministically at the site from such an event indicate that the referenced level of ground motion is at about the median (50%) level that could be expected from such an earthquake.

Although absolute estimates of probability with respect to earthquake hazard cannot be made with great accuracy, it is the staff's judgement, based on the above, that the chance of exceeding the 0.4g Housner Spectrum at periods of 0.5 to 0.6 seconds at 4% damping during an 8 month period is low.

III. Seismic Resistance of Structures, Systems and Compoonents

A. Containment Sphere and Reactor Building

The containment sphere and the reactor building were originally designed using the Housner Spectra with 0.25g and 0.5g horizontal acceleration for the Operating Basis Earthquake (OBE) and the Safe Shutdown Earthquake (SSE) respectively.

In its Seismic Backfit Project, as discussed in Reference 3, the licensee performed a seismic reevaluation for certain structures (containment sphere and reactor building), piping (the primary reactor coolant system), and components (steam generators, reactor coolant pumps, pressurizer, and reactor vessel).

The analyses were performed using 0.67g Housner Spectra. The containment sphere, the reactor building and the primary reactor coolant system are three subsystems considered in the system analysis. Each system model included the dynamic characteristics of all major subsystems in a coupled time history analysis. The effect of soil-structure interaction was included. The models used in these analyses were three dimensional, and torsional effects were automatically included.

The response spectrum method in conjunction with a three-dimensional finite element model was used for the seismic reevaluation of containment sphere, foundation and the reactor building. The multi-directional components of the earthquake and the modal responses were combined in accordance with Regulatory Guide 1.92.

Based upon their reanalyses, the licensee concluded for the containment sphere, the reactor building and structural steel framing that these structures have resistance capacities in excess of those required to meet 0.67g Housner Spectra. As a result, modifications were not necessary. While we have not completed our review of these reanalyses, our preliminary review indicates that these results appear reasonable and are consistent with results from audit analyses performed by NRC for structures of other SEP plants.

B. Standby Power Addition Project and Sphere Enclosure Project

The Standby Power Addition Project (including the Diesel Generator Building) and the Sphere Enclosure Project (including the Sphere Enclosure Building) were designed based on the 0.67g Design Spectra developed for San Onofre Units 2 and 3 (Reference 2). The design criteria and procedures used for these two structures are the same as those used for SONGS Units 2 and 3 which have been evaluated and accepted by the NRC staff. These projects were approved by the NRC in Amendment No. 25 to Provisional Operating License No. DPR-13 (Reference 5).

C. Reactor Auxiliary Building, Fuel Storage Building, Control Building

For these three buildings, with the exception of masonry walls, the Housner Response Spectra scaled to 0.5g for the SSE and 0.25g for the OBE were used in the simplified dynamic analysis for the original design. The vertical spectra were 2/3 of the horizontal spectra. The stress components were combined by absolute addition for the vertical and horizontal direction.

Design margins of at least 2 to failure typically exist in well built stuctures as a result of design code allowables, seismic design conservatisms and inherent seismic resistance. Therefore, 34% increase in input motion, 0.67g vs. 0.5g Housner Spectra, should be accommodated safely by these structures, although modifications may be required to restore design margins for the higher seismic input.

Evaluations of masonry walls in the facility considering the 0.67g Housner Spectra are proceeding. The licensee's analysis to date indicates that masonry walls are capable of resisting this level of motion without collapse.

D. Turbine Building Structures

The Turbine Building structures consist of five separate free-standing structures, connected by common foundation elements. These structures are:

1) The Turbine Pedestal;

2) The North Turbine Building Extension;

3) The South Turbine Building Extension;

4) The East Feedwater Heater Platform; and

5) The West Feedwater Heater Platform.

The turbine pedestal consists of massive concrete slabs and columns and its initial seismic design basis was 0.5g Housner Spectra. The remaining turbine building structures were designed to a 0.2g horizontal static coefficient. These structures consist of post-tensioned concrete slabs supported by steel framing. The columns are welded to the beams supporting the slabs and attached to the concrete foundation elements using embedded anchor bolts. Some reinforced concrete block masonry walls exist in each structure.

During meetings and a site visit in early June 1981 the licensee identified the following preliminary modifications to the Turbine Building structures to provide resistance to the 0.67g Housner Spectra seismic input. The modifications include the addition of substantial lateral bracing from floor to ceiling in both the North-South and East-West directions for both the North and South Turbine Building Extensions and both Feedwater Heater Platforms to increase their lateral resistance to seismic motions and to prevent possible impact with the Turbine Pedestal.

1. System Considerations

The failure of any, or all, of the following structures could adversely affect safety systems:

. North Turbine Building Extension.

Earthquake induced collapse of this structure would impair the function of safety related systems, including the main steam lines and their isolation valves (i.e. the turbine stop valves), the feedwater and auxiliary feedwater (AFW) system lines, Emergency Core Cooling System (ECCS) lines, cables for instrumentation and controls required for decay heat removal, and the power supply cables for the charging pumps, thereby eliminating all methods for providing water to remove reactor decay heat.

. West Feedwater Heater Platform.

Collapse of this structure, induced by an earthquake, would impair the function of safety related systems, including the AFW pumps, instrument air compressors, and steam and feedwater lines. All methods for providing water to the steam generators to remove decay heat would be eliminated. An alternate method for cooling of the core using primary system feed and bleed is possible and is discussed below.

. East Feedwater Heater Platform

Collapse of this structure, induced by an earthquake, would impair the function of safety related systems, including the feedwater and ECCS systems. The break of the feedwater system is postulated at the Feedwater Heater. Check valves are

installed upstream of the heater on the three feedwater lines going to each steam generator. Therefore, a path for decay removal using the auxiliary feedwater system is available. The alternate method for cooling the core using primary system feed and bleed is also available. Therefore, the consequences of collapse of this platform are less severe than those of the West platform.

- South Turbine Building Extension

  Collapse of this structure, induced by an earthquake, would impair the function of safety related systems including the remote Safe Shutdown Panel, loss of electrical power for ECCS loop C, loss of one loop of ECCS for recirculation mode, loss of offsite power and possible loss of the condensate storage tank or piping. However, an alternate suction suction path for auxiliary feedwater would be available with operator action using the fire water system. The consequences of collapse of this structure are the least severe and would not prevent removal of reactor decay heat.

- Alternate Method of Decay Heat Removal

  In their August 11, 1981 submittal the licensee discussed an alternate method of decay heat removal, using primary system feed and bleed, which can be initiated by the operator from the control room. The charging pumps, taking suction on the refueling water storage tank (RWST), would be used to deliver water to the primary system through the long-term post-accident recirculation flowpath. The pressurizer power-operated relief valves would be opened to reject heat to the primary containment. After sufficient water is in the sump the recirculation heat exchanger would be used to remove the decay heat to the ultimate heat sink.

  The equipment needed to implement the above means of decay heat removal are separate from and independent of a postulated failure of the west feedwater heater platform. The equipment can be powered from on-site power sources. Backup nitrogen supplies are available and may be needed to operate pneumatic components if the instrument air system is impaired.

  The licensee has calculated that a delay of 30 minutes before the alternate decay heat removal system is operational would not result in uncovering of the core. The calculations also showed that the alternate method has sufficient capacity to remove the decay heat load.

As discussed in the licensee submittal of September 28, 1981, plant operating procedures were developed in response to post-TMI Bulletins and Orders for natural circulation cooling, for inadequate core cooling and for PORV operation. Primary feed and bleed using these procedures is a scenario that is covered in operator training.

Although the staff has not reviewed the licensee calculations in detail, this alternate decay heat removal method would be available for cooling should the West Feedwater Heater Platform be damaged by a large earthquake.

2. Inherent Seismic Resistance

The licensee performed a detailed analysis to establish the structural capacity of the North Turbine Building Extension, the West Feedwater Heater Platform and masonry walls in the Turbine Building. These results were reviewed during a meeting with the staff on July 30, 1981. A simplified dynamic analysis of the entire Turbine Bulding considering soil structure interaction (SSI) was performed to determine the fundamental vibrational modes and mode shapes for the North Turbine Building Extension and the West Feedwater Heater Platform. To determining the capacity of the structures, accelerations from the 4% damped 0.5g Housner Spectrum was used in a static analysis. Total force response in any one direction was obtained by combining 100 percent of the maximum response due to one earthquake component with 40 percent of the maximum response due to the other two earthquake components. During the meeting, the staff requested the licensee to verify by inspection that the welded connections were installed as designed and to evaluate the capacity of the column to girder connections. The results of the licensee's analyses and evaluations are contained in their August 11,1981 submittal. The results indicate that:

1) the welded connections were installed in accordance with the original design;

2) the connections are adequate up to the onset of yield in the columns; and

3) the connections would exceed their elastic limit at significantly less than the full moment capacity that could be developed by the column.

These results confirmed that the welded column to girder connections were the limiting element in the original design of these structures.

The licensee has also performed a detailed inelastic analysis of the masonry walls using an input of 0.67g Housner. The analysis results indicate that displacements up to 10" at midspan could occur but the wall would not collapse. The staff has not completed its review but believes that, although degradation (spalling and potential limited overstraining of rebar) could occur, collapse is not likely.

For analyses of the North Turbine Building Extension and West Feedwater Heater Platform Structures, the licensee assumed a ground motion amplification factor of 1.4 (based upon their calculated frequencies and a 4% damped Housner Spectrum). The onset of structural yielding was predicted to occur at approximately 0.3g to 0.4g Housner Spectrum for the North Turbine Building Extension and for both East and West Feedwater Heater Platforms. The South Turbine Building Extension would yield at a lower value.

At the onset of ductile behavior, significant redistributions of loads in the members will begin to take place. Since the original column to girder connections could not develop the full plastic moment capacity of the columns, the licensee upgraded the strength of the connections on column lines B and D of the North Turbine Building Extension (a total of 5 of 8 such connections). These connections have been modified such that the full plastic moment capability of the columns can be developed. Considering that girder capacities are in excess of the column capacities and assuming that the column to foundation anchorages (i.e., bottom connections) are adequate, the top connections for columns line B and D are sufficient to allow some limited ductility for the North Turbine Building Extension. Column line B provides primary resistance to North-South motion, therefore without considering restraint from adjacent structures (given the several inch gap that exists between the Enclosure Building and North Turbine Building Extension), these modified connections should be adequate to develop ductile behavior.

The adequacy of the column to foundation anchorages in the North Turbine Building Extension is a key factor in the strength of the structure to resist earthquakes. Previous licensee analysis indicated anchor bolt capacities in the range of 0.39g to 0.48g Housner. These results indicated capacities in excess of the original top connections. Additional analysis considering the effects of column imbedment in the floor was presented to the staff on October 16, 1981, and is contained in the licensee's submittal dated October 19, 1981. Recognizing the limitations of using elastic analysis to predict ductile behavior and other uncertainties in the licensee's analysis of the anchor bolt capacities, the staff believes that the capacity of the structure to resist North-South ground motion is about 0.4g Housner Spectrum.

Column lines A and D provide the primary resistance of the North Turbine Building Extension to East-West motion. Only column line D is being modified. However, substantial restraint to the half of the structure supported by column line A is provided by the approximate 1 1/2 inch gap between it and the top of the spent fuel pool on the west side and the operating deck of the Control Building on the east side. Therefore, considering (1) the unmodified column line A connections should remain elastic up to a displacement of about 1 1/2 in., at which point the gaps would close and the restraint from the adjacent structure would be realized; and (2) the ductile behavior of column line D to resist seismic motions including any torsion which may result from the impacts with the adjoining structures, the staff concludes the seismic resistance capability of the structure in the East-West direction should be comparable to that of the North-South direction.

The staff estimates that the East and West Feedwater Heater Platforms are likely to have the capability to resist earthquake input in the range of 0.3 to 0.4g Housner. The performance of the North Turbine Building Extension based upon the recent modification of the top connections and considering the displacement constraints offered by the adjacent structures is likely to have the capability to resist earthquake input of about 0.4g Housner. The South Turbine Building Extension would be expected to fail at an earthquake level less than that for the East or West Feedwater Platform due to the substantial added load that it must carry due to the crane which is normally positioned over the South Turbine Building Extension.

E. Safety Related Mechanical Equipment

The original design of the safety related piping was based on the ANSI B31.1 code for power piping using the Housner Spectrum (0.5% damping) scaled to 0.25g which resulted in response accelerations of 1.0g and 0.67g for horizontal and vertical components respectively (Reference 4). The original design basis for all equipment (mechanical and electrical) initially classified as safety related was 0.5g Housner Spectra with 1% and 2% damping ratios.

In its Seismic Backfit Project (as discussed in Reference 3), the licensee performed a seismic reevaluation for certain structures (containment sphere and reactor building), piping (the primary reactor coolant system), and components (steam generators, reactor coolant pumps, pressurizer, and reactor vessel). The analyses were performed using 0.67g Housner Spectra. The containment sphere, the reactor building and the primary reactor coolant system are three sub-system models considered in the analysis. For example, the system model for the coolant loops included a detailed model of the reactor coolant system, with simplified models representing other components, systems and structures (containment sphere and reactor building). The simplified models were developed from more detailed models. The analysis included the dynamic characteristics of all major subsystems in the coupled time history analysis.

The analysis of the reactor coolant system was based on the direct application of ground motion input to the complete closed system model. Based upon the results of this analysis some support modifications were made for large NSSS equipment (i.e., steam generators and pressurizer, etc.) to resist overturning and to accomodate large thermal expansion. We have not yet completed our review of these reanalyses. Attached branch piping was not included in this reevaluation, but was initially designed considering a 0.5g Housner Spectra.

The equipment in the Standby Power Addition Project was designed for the same seismic input as San Onofre Units 2 and 3. The design basis was 0.67g Modified Newmark-Hall Spectra (Reference 2). The piping and mechanical equipment were designed (Reference 11) in accordance with the applicable sections of the ASME B&PV Code and are acceptable.

The auxiliary feedwater (AFW) system was not originally designated as a safety related system. Therefore, the system was originally

designed to resist a 0.2g static horizontal acceleration. New discharge piping and portions of the steam supply piping to the steam driven AFW pump have been installed and were upgraded in their seismic design to 0.67g Housner Spectra. However, other portions of the AFW system (e.g., the supply piping to the AFW pumps and the condensate storage tank) have not been and are not presently being upgraded. The seismic design basis for the portions of the system which have not been upgraded is a 0.2g static horizontal acceleration.

On November 24 and 25, 1980, the NRC staff conducted a site visit and a walk-down of the SONGS 1 auxiliary feedwater (AFW) system. Based on our observations of the existing AFW system, the NRC Staff concluded that some inherent seismic resistance capability was provided in the initial design and construction for much of the system. Piping, cable trays, equipment and components were generally provided with lateral support.

Three areas of concern were identified which required remedial actions prior to the resumption of power operation of SONGS 1. The first concern was the Station No. 1 battery racks. While the existing racks provided for some degree of lateral seismic load resistance and are redundant to the much more substantial No. 2 battery racks, the configuration did not appear to have a level of integrity commensurate with the importance of the batteries to plant safety. These racks appeared less capable of continued integrity following a seismic event when compared to the No. 2 battery racks which were installed to the seismic design criteria specified for their diesel generator installation. Therefore, we required that the existing No. 1 battery racks be re-evaluated using the current SSE specified criteria, and modified accordingly.

The second concern was the suction piping to the AFW pumps, which consists of a single header from the condensate storage tank to the pumps. The header has some lateral support. However, the condensate storage tank was not qualified to the initial or current SONGS 1 seismic criteria for safety related systems. The tank is not anchored at its base. It merely rests on the ground. Also, the permanent alternate water supply is through the tank. There is a capability to install a hose from a seismically qualified water source to the AFW pump suction and bypass the condensate storage tank. We required that a hose be installed and kept attached to

the appropriate connections to facilitate its use if it became necessary to do so.

The third concern was with the main instrumentation and control panels in the control room. These are supported at the bottom by a concrete channel and at the top by steel knee braces anchored to the concrete ceiling with expansion anchors. The requirements of IE Bulletin 79-02 (the concrete expansion anchor and base plate issues) had not been applied to these anchor bolts and base plates. We stated that conformance with the IE Bulletin requirements for factors of safety, considering base plate flexibility, must be assured for the original design of these panels. Also, some bolts and screws were missing in these panels. We required that the licensee inspect all screws, bolts and nuts in the panel for their presence and integity. Missing fastening devices were to be replaced.

These three actions were completed by the licensee prior to their restart in June 1981.

Based upon the detailed walk-downs of the SONGS 1 AFW system, the AFW system possesses an adequate degree of seismic resistance and redundancy to permit plant operation during the near term seismic reevaluation and upgrading of this system required of all operating PWRs by NRR Generic Letter dated February 10, 1981. However, this conclusion is contingent upon the structural integrity of the North Turbine Building Extension, the West Feedwater Heater Platform and any masonry walls whose failure could impair the function of the AFW system.

F. Anchorage and Support of Class IE Electrical Equipment

In response to the NRC's letters of January 1 and July 28, 1980, on tie-down of safety related electrical equipment, the licensee conducted a walk-through visual inspection of the plant and made a preliminary assessment of the adequacy of equipment tie down. The licensee surveyed approximately fifty-nine items and found that approximately two-thirds were adequately secured. Based on the results of these preliminary assessments, interim modifications were completed for the remaining items in July and August 1980.

Following completion of these interim modifications, detailed analyses were performed on the anchorages of all identified items. These analyses were divided into two phases. The first phase included all equipment at grade elevation for which response spectra were available (the 0.67g Housner Spectra). The results of these analyses confirmed the adequacy of the preliminary assessments and the interim modifications with five exceptions. The five items were the battery racks, the Uninterruptable Power Supply battery rack, the High Voltage control board, the 5kVa inverter and the battery chargers.

The second phase of the program included all equipment located in the control room. The analysis of the anchorage of safety related electrical equipment in the control room is based on the estimated floor response spectra with a peak floor acceleration of 2.0g. From the results of the analyses, additional modifications were found to be required for process control racks R1 through R7, R10 and R11, the nuclear instrumentation system, radiation monitoring system, vital bus assembly, and containment system actuation system logic Train A cabinets.

All modifications identified by the licensee to be necessary to resolve all electrical equipment anchorage have been implemented. Our review of the adequacy of these modifications is continuing.

IV. Seismic Reevaluation Program

In accordance with 10 CFR 50.54(f) of the Commission's regulations, a letter was issued on August 4, 1980 to Southern California Edison Company requesting that the licensee:

1. submit details of a seismic reevaluation program plan addressing the scope of review, evaluation criteria and a schedule for completion; and

2. provide justification for continued operation in the interim until the program is complete.

It was noted in our letter that the proposed program plans and schedule for an expanded program should include an evaluation of the following:

1. the remainder of the reactor coolant pressure boundary (i.e., all attached piping/equipment),

2. safety related mechanical and electrical equipment to bring the plant to cold shutdown, and

3. safety related mechanical and electrical systems required to mitigate the consequences of an accident.

In its response to this letter the licensee referenced its April 28, 1980 submittal (Reference 1) as its basis for continued operation in the interim until the program is complete. The program scope and schedule in this submittal needed to be modified to include the reevaluation of piping and mechanical/electrical equipment.

Subsequently, several meetings were held between the licensee and the NRC Staff to discuss the seismic reevaluation program scope and schedule.

The licensee partially responded in a letter submitted on February 23, 1981, entitled "Balance of Plant Structures Seismic Reevaluation Criteria." This document provides a detailed description of the methodology and criteria to be used in seismic reevaluation of each of the plant strutures included in the program, with the exception of the upgraded projects previously discussed which include the Reactor Building, Steel Containment Sphere, Sphere Enclosure Building, and Diesel Generator Building.

A follow-up to the 10 CFR 50.54(f) letter was sent to the licensee on April 24, 1981 requesting the information on the complete scope and schedule for the reevaluation program. In response to our April 24, 1981 letter, the licensee submitted a description of complete program scope and schedule on July 7, 1981.

SCE has committed to complete the balance-of-plant structures and masonry wall evaluations by January 1982. SCE also proposed that any modifications be evaluated to determine if they would be impacted by other SEP topic evaluations and therefore should be deferred to the SEP integrated safety assessment. By May 1, 1982, SCE is scheduled to have reevaluated the remainder of the primary coolant pressure boundary and all structures and mechanical systems required to bring the plant to a safe shutdown. Accident mitigating systems will be completed by November 1982.

V. Conclusion

As discussed in the above evaluation, significant seismic upgrading of the San Onofre Unit 1 facility is underway, much has been accomplished and more is scheduled. The staff also agrees with the licensee's April 28,1980 basis for continued operation for those structures, systems and components which were originally designed to meet a 0.5g Housner Spectra as ground motion input.

However, not all safety related structures and systems were designed to this level of ground motion. In particular two critical areas of the Turbine Building complex (North and West Extensions), several masonry walls and the Auxiliary Feedwater system are in this category. It is the NRC's judgment that the inherent seismic capability of the AFW system and the additional water supply that bypasses the normal suction piping provide an adequate basis for continued operation during the seismic reanalysis and upgrading of the Auxiliary Feedwater System. Based on our review to date, we consider the masonry walls have adequate seismic resistance, although spalling and rebar overstraining may be expected to occur at levels somewhat below the 0.67g Housner Spectra used by the licensee in his analyses. Our evaluation of the North Turbine Building Extension and the West Feedwater Heater Platform indicate an inherent capacity to withstand seismic events in excess of the original design (0.2g Static). As discussed in Section III.A.4, the staff estimates that the North Turbine Building Extension would have the capacity to withstand an earthquake input level of 0.4g Housner.

The staff has concluded that certain modifications to (1) the North Turbine Building Extension and (2) the West Feedwater Heater Platform are necessary in the near term to increase the capability of certain plant structures to resist earthquakes at SONGS 1 to assure that continued operation of the facility is not inimical to the health and safety of the public.

For the reasons discussed in Section II.B., Near-Term Seismic Hazard, the probability is low that ground motion at the reactor site greater than that characterized by 0.4g Housner Spectrum would be exceeded. Therefore, considering the plant's ability to resist strong ground motion, as discussed in Section III, Seismic Resistance of Structures, Systems and Components, and considering the low probability of the ground motion discussed above until June 1, 1982; the staff concludes that short term operation of San Onofre Unit 1 during the seismic re-evaluation of the facility and the implementation of any modification shown to be necessary as a result of seismic reanalysis is acceptable under the following conditions:

(1) Structural upgrading of the North Turbine Building Extension and West Heater Platform by adding diagonal steel bracing is to be completed by June 1, 1982 or the facility is to be shut down until such upgrading is completed;

(2) Results of seismic analysis of structures are to be submitted for NRC review by January 31, 1982 and for all other items on the schedule specified in the licensee's November 3, 1981 letter;

(3) Any modifications shown to be necessary as a result of the seismic analysis which are not implemented by January 1, 1983 are to be justified on a case by case basis with a schedule for implementation; and

(4) Prior to upgrading of the North Turbine Building Extension and West Heater Platform, either the gantry crane is to be parked at the extreme south limit of travel or the reactor is to be shut down during periods when crane movement is required.

REFERENCES

1. "Seismic Reevaluation Program," San Onofre Nuclear Generating Station, Unit 1, April 28, 1980.

2. Safety Evaluation Report (SER) on Geology and Seismology for San Onofre Nuclear Generating Station Units 2 and 3, NUREG-0712, December 1980.

3. "Seismic Reevaluation and Modification," San Onofre Nuclear Generating Station, Unit 1, April 29, 1977.

4. "Seismic Design Bases and Criteria for San Onofre Nuclear Generating Station Unit 1," Docket Summary, prepared by Lawrence Livermore National Laboratory, August 1979.

5. "Safety Evaluation by the Office of Nuclear Reactor Regulation Supporting Amendment No. 25 to Provisional Operating License No. DPR-13," San Onofre Nuclear Generating Station, Unit 1, April 1, 1977.

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-206

SOUTHERN CALIFORNIA EDISON COMPANY

SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1

ISSUANCE OF DIRECTOR'S DECISIONS

UNDER 10 CFR 2.206

By petitions received since November 1979 (44 FR 75535, December 20, 1979) approximately 1560 California residents have requested that the Nuclear Regulatory Commission's Director of Nuclear Reactor Regulation suspend or revoke the operating license for the San Onofre Nuclear Generating Station, Unit 1. By letter dated July 10, 1981, Mr. Ralph Nader also requested that operation of San Onofre Unit 1 be suspended pending completion of a "license review" for the facility. The petitions and Mr. Nader's letter have been considered under the provisions of 10 CFR 2.206.

The petitions allege that San Onofre Unit 1 is not designed to withstand possible ground motions from earthquakes that may occur and that evacuation plans are inadequate to cope with a potential accident at the site. Moreover, in an updated petition distributed by the Alliance for Survival in 1980, the petitioners expressed seismic concerns in light of the Livermore earthquake of January 1980. The updated petition also pointed out that the Rogovin Report to the Nuclear Regulatory Commission on the Three Mile Island accident recommended that old reactors near major cities be shutdown until evacuation plans are realistic. Mr. Nader requested that operation of San Onofre Unit 1 be suspended until that review is completed.

Upon review of information pertaining to the seismic and evacuation concerns at San Onofre Unit 1 and the information provided by the petitioners and Mr. Nader, the Director of Nuclear Reactor Regulation has determined that suspension or revocation of the operating license for San Onofre Nuclear Generating Station, Unit 1, is not warranted. Accordingly, the requests of the residents of California and Mr. Nader have been denied. The reasons for this denial are explained in two "Director's Decisions" under 10 CFR 2.206 (DD-81-19; and DD-81-20) which are available for public inspection in the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Mission Viejo Branch Library, 24851 Chrisanta Drive, Mission Viejo, California.

A copy of the decisions will be filed with the Secretary for the Commission's review in accordance with 10 CFR 2.206(c). As provided in this regulation, the decisions will become the final action of the Commission twenty-five (25) days after issuance, unless the Commission on its own motion institutes review of these decisions within that time.

Dated at Bethesda, Maryland, this 16th day of November, 1981.

FOR THE NUCLEAR REGULATORY COMMISSION

Harold R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

November 16, 1981

Docket No. 50-206
LSO5-81-11-022

LETTER TO CALIFORNIA RESIDENTS

SUBJECT: DIRECTOR'S DECISION UNDER 10 CFR 2.206 (DD-81-19)
SOUTHERN CALIFORNIA EDISON COMPANY
(SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1)

This is in response to petitions received by the Nuclear Regulatory Commission since November 1979 requesting that the Director of Nuclear Reactor Regulation suspend or revoke the operating license for the San Onofre Nuclear Generating Station, Unit 1.

The petitions allege that San Onofre Nuclear Generating Station, Unit 1 is not designed to withstand possible ground motions from earthquakes that may occur and that evacuation plans are inadequate to cope with a potential accident at the site. Moreover, in an updated version of the petition distributed by the Alliance for Survival in 1980, the petitioners expressed additional seismic concerns in light of the Livermore earthquake of January 1980. The updated petition also pointed out that the Rogovin Report to the Nuclear Regulatory Commission on the Three Mile Island accident recommended that old reactors near major cities be shutdown until realistic evacuation plans are available for use. By letter dated July 10, 1981, Mr. Ralph Nader also requested that operation of San Onofre Unit 1 be suspended pending completion of a "license review" for the facility. We have responded to Mr. Nader's request in a separate decision under 10 CFR 2.206.

The petitions have been considered under the provisions of 10 CFR 2.206 of the Commission's regulations. This office has determined, for the reasons set forth in the enclosed Decision, not to issue an order suspending or revoking License No. DPR-13, which authorizes Southern California Edison to operate San Onofre Nuclear Generating Station, Unit 1. The Decision includes a recent staff report regarding the seismic capability of San Onofre Nuclear Generating Station, Unit 1.

A copy of this determination will be placed in the Commission's Public Document Room at 1717 H Street, N. W., Washington, D. C. 20555 and at the Mission Viejo Branch Library, 24851 Chrisanta Drive, Mission Viejo, California.

The decision will also be filed with the Secretary of the Commission for its review in accordance with 10 CFR 2.206(c) of the Commission's regulations. As provided for by this regulation, the decision will constitute the final action of the Commission twenty-five (25) days after the date of issuance of the decision unless the Commission, on its own motion, institutes a review of the decision within that time.

A copy of the Notice of Issuance of the Director's Decision, which is being filed with the Office of the Federal Register for publication, is also enclosed.

Sincerely,

Harold Denton

Harold Denton, Director
Office of Nuclear Reactor Regulation

Enclosures:
1. Director's Decision
2. Notice of Issuance

cc: See next page

cc w/enclosures:
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Mayor
City of San Clemente
San Clemente, California 92672

Chairman
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Mr. R. Dietch, Vice President
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Southern California Edison Company
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Rosemead, California 91770

The Honorable Jerry Brown
Governor of the State of California
State Capitol
Sacramento, California 95814

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of

SOUTHERN CALIFORNIA EDISON COMPANY
(San Onofre Nuclear Generating
Station, Unit 1)

Docket No. 50-206

NOTICE OF RECEIPT OF PETITION UNDER 10 CFR 2.206

Several hundred residents of California have submitted identical petitions requesting that the Director of Nuclear Reactor Regulation suspend or revoke the operating license for the San Onofre Nuclear Generating Station, Unit 1. As the basis for this request, the petitioners contend that new information is available concerning seismic conditions at the site of the San Onofre facility. The petitioners allege that Unit 1 is not designed to withstand possible ground motions from earthquakes that may occur in the vicinity. As an additional basis of their request, the petitioners allege that evacuation plans are inadequate to cope with a potential accident at the site.

These petitions are being considered under 10 CFR 2.206 of the Commission's regulations, and accordingly, appropriate action will be taken on the petition within a reasonable time. A copy of the petition is available for inspection in the Commission's Public Document Rooms at 1717 H Street, N.W., Washington, D. C. 20555 and at the Mission Viejo Branch Library, 24851 Chrisanta Drive, Mission Viejo, California 92676.

Harold R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland,
this 14th day of December, 1979.

DUPE OF
~~7912310~~

cc
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Chairman
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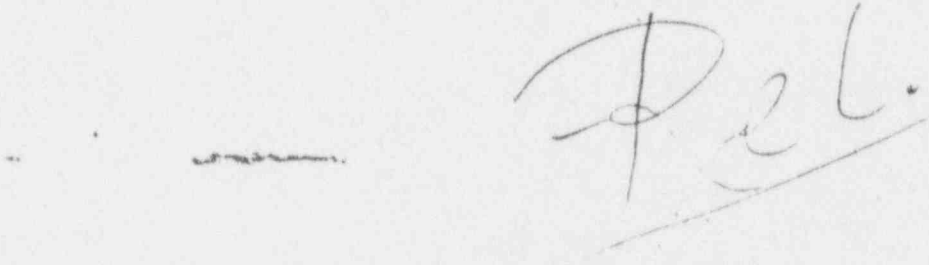


ATTACHMENT 2

REQUEST FOR INSTITUTION OF PROCEEDINGS TO REVOKE OPERATING LICENSE, 10 CFR 2.206

TO: Director of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission

As a concerned and interested resident of Southern California, who may be adversely affected by the unit's continued operating, I Jeffrey L. SmitH, request the Director of Nuclear Reactor Regulation to initiate a proceeding pursuant to 10 CFR 2.202 and 10 CFR 55.40 for the purpose of suspending or revoking the operating license for the San Onofre Nuclear Generating Station Unit One.

New and relevant information is now available on potential ground motions at the site in the event of an earthquake, and this information would have warranted the Commission to have refused to grant a license on the original application. Furthermore, the plant is located midway between Los Angeles and San Diego, one of the most densely populated and fastest growing areas in the country.

Unit I is not designed to withstand possible ground motions from earthquakes on the Newport-Inglewood and Christianitos faults and their branches which pass close to the reactor. These ground motions could break cooling water pipes, cause a loss of coolant accident, and lead to a meltdown of the fuel rods. The addition of a concrete shell to the reactor dome and other modifications are inadequate to insure against damages from possible ground motions during a maximum possible earthquake. The new and relevant information regarding ground motion potential was unavailable when the AEC approved the design criteria of Unit I or later when the NRC approved structural changes to the unit. Seismic design criteria for Unit I was based on inadequate data on measurements of ground motions close to the source of the earthquakes. Recent California earthquakes near Santa Barbara in August, 1978, near San Jose in August, 1979 and in Imperial Valley in October, 1979, have revealed new and relevant information about ground motions that was not available to the NRC for determining seismic design criteria for Unit I.

Because population growth near the San Onofre plant has been more rapid and extensive than could have been anticipated during the licensing of Unit I, there are no adequate evacuation plans for the area's residents in the event of a loss of coolant accident. Approximately nine million people live in the area that could be affected by the accidental release of radioactive gases from Unit I. The State and local governments are not prepared to evacuate the population within the short time between the accident and the spread of radioactive gases. When the AEC issued the construction permit in March of 1964, it was impossible to know the population of the region would increase so rapidly.

For the above reasons, and the associated risks to the health and safety of the people of Southern California, it is imperative that you take action to suspend or revoke the operating license for San Onofre Nuclear Generating Station Unit I.

Signed on this date, 11-14-79, 1979.

Jeffrey L. Smith
(Signature)

12882 DUNAS RD.
(street address)

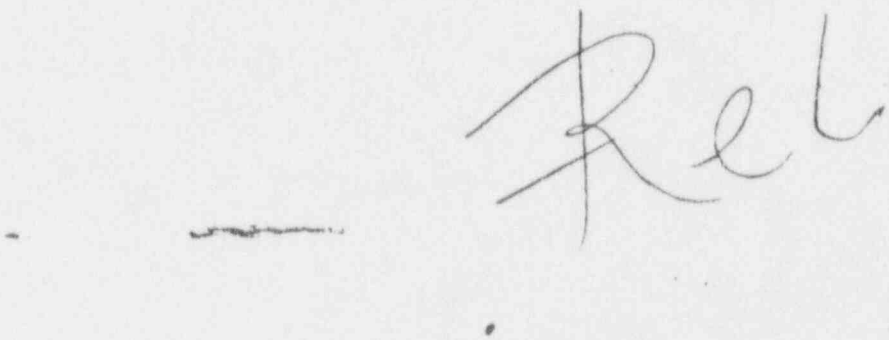
SANTA ANA, CALIF.
(city, state, zip code) 92705

!! Please !!

Save California

I will support this Request Fully

thank you



ATTACHMENT 3

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

November 16, 1981

Docket No. 50-206
LSO5-81-11-023

Mr. Ralph Nader
Center for Progressive Law
Post Office Box 19367
Washington, D. C. 20036

Dear Mr. Nader:

Your letter dated July 10, 1981, requested that the NRC should begin a license review of San Onofre Unit 1 and that operation of San Onofre Unit 1 be suspended until that review is completed. Our letters dated August 6 and 13, 1981, provided an interim response to your request.

Your concerns have been considered under the provisions of 10 CFR 2.206 of the Commission's regulations. This office has determined, for reasons set forth in the responses contained in the enclosed Decision, not to issue an order of suspension or revocation for San Onofre Unit 1. We have also included, as Enclosure 2 to this letter, the Decision under 10 CFR 2.206 pertaining to petitions filed by California residents since November 1979 which also requested that the Nuclear Regulatory Commission suspend or revoke the operating license for San Onofre Unit 1.

A copy of these determinations will be placed in the Commission's Public Document Room at 1717 H Street, N. W., Washington, D. C. 20555 and at the Mission Viejo Branch Library, 24851 Chrisanta Drive, Mission Viejo, California.

The decisions will also be filed with the Secretary of the Commission for its review in accordance with 10 CFR 2.206(c) of the Commission's regulations. As provided for by this regulation, the decisions will constitute the final action of the Commission twenty-five (25) days after the date of issuance of the decisions unless the Commission, on its own motion, institutes a review of the decisions within that time.

A copy of the Notice of Issuance of the Director's Decisions, which is being filed with the Office of the Federal Register for publication, is also enclosed.

Sincerely,

Harold Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Enclosures:
1. Decision - July 10, 1981 Nader Letter
2. Decision - California Residents
3. Notice of Issuance

cc:
See next page

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The Honorable Jerry Brown
Governor of the State of California
State Capitol
Sacramento, California 95814

DD-81-20

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION
HAROLD R. DENTON, DIRECTOR

In the Matter of	)	
	)	
SOUTHERN CALIFORNIA EDISON COMPANY	)	Docket No. 50-206
	)	(10 CFR 2.206)
(San Onofre Nuclear Generating Station, Unit 1)	)	
	)	

DIRECTOR'S DECISION UNDER 10 CFR 2.206

I

By letter dated July 10, 1981, Ralph Nader requested that the Nuclear Regulatory Commission (NRC) suspend the operating license for the San Onofre Nuclear Generating Station Unit 1 until a license review has been completed. His request is similar to the requests made in petitions received since November 1979 (44 FR 75535, December 20, 1979) from approximately 1560 residents of California which also have been considered under 10 CFR 2.206 of the Commission's regulations.

The asserted bases, in summary form, for the request by Mr. Nader were that:

(1) San Onofre Unit 1 has been identified as having the highest probability of a meltdown of any California reactor.

(2) San Onofre Unit 1 is designed to withstand a 5.0 magnitude seismic event, yet the Newport-Inglewood Fault 4 miles offshore is capable of a 7.5 magnitude earthquake.

(3) Half of the population of California would be affected by a serious accident at San Onofre.

(4) No workable or demonstrated evacuation plan exists for the immediate 10 miles surrounding the plant.

(5) A review by the Federal Emergency Management Agency concluded that the demonstration of the evacuation planning is "woefully inadequate." The NRC's own analysis (NUREG-0490) states that a meltdown accident at San Onofre could cause up to 130,000 acute deaths and 300,000 latent fatalities.

In addition, Mr. Nader asserts that new seismic information underscores the gravity of the situation at San Onofre and that Unit 1 is externally and internally susceptible to any major ground motion.

The issue of seismic capabilities of the San Onofre Nuclear Generating Station Unit 1 and the adequacy of the evacuation plans are discussed in a separate decision (DD-81-19) in response to the petition by approximately 1560 Southern California residents. That decision is hereby incorporated by reference. This decision responds to the additional allegations made by Mr. Nader, paragraph by paragraph, in the following discussion.

II

Mr. Nader asserts in paragraph three, item 1 of his July 10, 1981 letter that:

> "San Onofre Unit I has been identified as having the highest probability of a meltdown of any reactor in California, according to a study prepared by Science Applications, Inc., for the California Office of Emergency Services."

The staff has performed a brief review of the Executive Summary of the lengthy report. The report does not directly state that, but instead refers to the comparative probabilities of accident occurrences per year for each of the scenarios examined. As an example, Scenario 1 is containment failure by "energetic missile produced by steam explosion" and includes the assumption that containment sprays do not operate. The probability of this event is 5×10^{-7} per year for San Onofre Unit 1. This is approximately a factor of ten times the probability of occurrence of this scenario at the WASH-1400 plant (Surry) and the factor of 10 difference is generally carried throughout the remainder of the accident sequences studied. However, the probability of the event is only one of a number of significant parameters with regard to implications of impact of an accident upon the health and safety of the public.

What is equally important in the study is the predicted consequences of the events under consideration. Table 3-1 of the study's Executive Summary shows that expected downwind whole body doses from the accident scenarios are less at San Onofre 1 than at any other California plant except Humboldt Bay (which is shut down). Table 3-2 of the Executive Summary shows that less than 0.1 early fatalities are expected from the three worst scenarios at San Onofre 1, using 1975 population figures and assuming no emergency protective actions. This information is consistent with the NRC staff's studies discussed below.

The Executive Summary also states that "there is roughly a 50 percent probability that a release at...San Onofre...would be blown completely or partially in the direction of the Pacific Ocean." Two conclusions of the report are particularly germane:

> "1. The probabilities of occurrence of accidents at a nuclear power plant in California that threaten the health and safety of people residing near the site are generally lower than comparable values in WASH-1400 and are on the order of one chance in a million per year of reactor operation.
>
> 2. While the probability of serious hypothetical accidents is very low, the consequences can be substantial if effective evacuation and interdiction measures are not taken. The consequences for nuclear power plants in California are generally somewhat less than those reported in WASH-1400."

The NRC staff has recently completed conservative studies. These studies show that, under severe accident conditions, including containment failure (although not by vessel steam explosion), an accident at San Onofre 1 would not have nearly the consequences purported by Mr. Nader, who referenced conservative assumptions for San Onofre 2/3 from a supplement to draft NUREG-0490. The final NUREG-0490 is the Final Environmental Statement for Units 2 and 3 and was not intended to address Unit 1. Unit 1 has a smaller radioactive material inventory than Unit 2 or 3 and consequences would, therefore, be less.

Tables 1 and 2 of Appendix B are a summary of calculated consequences of various accident sequences at San Onofre 1, using the actual power level of 1347 MWt and assuming evacuation to 10 miles (Table 1) and 20 miles (Table 2). The assumptions for the Siting Source Terms (SST) 1, 2, and 3 are presented in Table 3 of Appendix A, where the type of accident and nature of containment leakage are explained. The consequences of SST-4 and SST-5 sequences are less

severe than those of SST-1, -2, and -3 and therefore the -4 and -5 sequences are not included. The various evacuation scenarios used in the studies are presented in Table 4 of Appendix A.

There are several assumptions that must be highlighted. They are: (1) containment failure is assumed to occur in 1.5 hours for the SST-1 scenario, the worst-case accident considered in the study; (2) population densities and distributions utilized are from 1970 census data which is a nonconservative factor by perhaps as much as 30%; 1980 census data are not available in computerized form and the 30% nonconservatism is insignificant when compared to other conservatisms and nonconservatisms in the analysis; (3) meteorological assumptions were gleaned from regional meteorology, since continuous sampling was available over longer periods. However, the site-specific wind rose was used. Although the use of regional meteorology may appear to be nonconservative and there is uncertainty associated with the use of any one year's data, the NRC's studies have shown that accident consequences are relatively insensitive to regional meteorology; (4) peak and probability of peak values were derived from conservative assumptions involving dispersion of the radioactive cloud; and (5) evacuation is considered only out to 10 miles for Table 1, but peak values are generated conservatively from radioactive cloud deposition at a population center outside 10 miles.

Examination of Table 1 shows how overstated the values of the supplement to draft NUREG-0490 are as quoted by Mr. Nader in his assertions regarding San Onofre Unit 1. The ongoing NRC Siting Analysis study has provided some idea of the risk of operation of San Onofre 1. That risk is not as significant as Mr. Nader implies.

Table 1 presents results based upon an assumed evacuation to 10 miles but using the conservative radioactive cloud deposition beyond 10 miles, as noted in assumption (5) above. Table 2 utilizes the same conservative deposition assumption but includes evacuation to 20 miles. However, as noted below (response to paragraph 3 items 3, 4, and 5), the NRC requires only an evacuation plan to 10 miles because studies show that a plan beyond 10 miles is not generally necessary. Table 2 has been included here only to show the conservatism of the assumptions that were included in Table 1. For the very low probability accidents having the potential for causing radiation exposure above the threshold for acute fatality at distances beyond 16 km (10 mi), it would be realistic to expect that authorities would evacuate persons at all distances at which such exposures might occur.

The NRC staff is satisfied, based on their review of accident scenarios that there are no special or unique features about San Onofre Unit 1 that would warrant special or additional engineered safety features.

Mr. Nader asserts in paragraph three, item 2, of his letter:

> "The Newport-Inglewood Fault, only four miles offshore, is capable of a 7.5 magnitude earthquake, according to the U.S. Geological Survey. A 7.5 magnitude quake is ten times greater than the 6.5 magnitude quake that San Onofre Units II and III are theoretically capable of withstanding. By comparison, Unit I is designed only to withstand a 5.0 magnitude seismic event."

The geologic and seismologic investigations and reviews for the San Onofre Nuclear Generating Station (SONGS) site are among the most extensive ever conducted for nuclear power plants. This included seismologic and geologic studies of Southern California and Baja California in general and specific studies related to the immediate site vicinity.

The Offshore Zone of Deformation (OZD) is about 8 km from the SONGS site at its closest approach to the site. The maximum earthquake on the OZD was determined from historic data and instrumentally recorded seismic activity and from fault parameters, including slip rate, fault length, and fault area. The vibratory ground motion at the site due to the occurrence of the maximum earthquake on the OZD was determined by the use of empirical methods, theoretical models, and an examination of recent recordings of strong ground motion from earthquakes.

The seismic record in the Southern California region extends back to the 18th century. From 1932 to the present a relatively complete listing of instrumentally determined earthquakes is available. Listings of earthquakes of Richter Magnitude 5 or greater within 320 km of the site and all listed earthquakes within 80 km of the site, for which instrumental records are available, were reviewed. The spatial density of these events varies with location. The vicinity of the SONGS site (within approximately 30 km) appears to be one of relatively low seismicity.

The areas of Southern California which might be characterized as seismically active are the San Jacinto, San Fernando, White Wolf, and Imperial Valley faults. These faults are in the range of 80 km to 240 km from the SONGS site at their closest approach and, therefore, are considered to present no seismic challenge to the plants.

Based upon its evaluation for the SONGS Units 2 and 3 in NUREG-0712, the staff concluded that an appropriate representation of the maximum earthquake on the OZD to be used in determining the safe shutdown earthquake (SSE) at SONGS is M_s (surface wave magnitude) = 7.0. The SONGS Units 2 and 3 design actually

exceeds a conservative representation of the ground motion expected from an M_s = 7.0 earthquake at a distance of 8 km.

The Newport-Inglewood Fault is approximately 35 km northwest of the SONGS site at its closest approach to the site. As a conservatism in estimating the maximum earthquake to be expected on the OZD, the staff considers the Newport-Inglewood fault, the Southcoast Offshore Zone of Deformation and the Rose Canyon fault as one continuous zone of deformation. Mr. Nader's allegations on San Onofre Unit No. 1 describe the Newport-Inglewood fault as being 4 miles offshore (it is approximately 35 km from the site) and as "being capable of a 7.5 magnitude earthquake, according to the U.S. Geological Survey." This characterization is based on the U.S. Geological Survey Open-File Report (OFR) 81-115, "Scenarios of Possible Earthquakes Affecting Major California Population Centers, with Estimates of Intensity and Ground Shaking." The context in which OFR-81-115 was written must be understood. The Preface of OFR 81-115 follows:

> "Following the President's trip to review the destruction caused by the eruption of Mount St. Helens on May 18, 1980, he directed that an immediate assessment be undertaken of the consequences of, and state of preparedness for, a major earthquake in California. The review was conducted by an ad hoc committee of the National Security Council chaired by Frank Press, the President's Science Advisor.
>
> This report was compiled by the staff of the U.S. Geological Survey Office of Earthquake Studies for use by government agencies in estimating casualties, economic losses, and overall disaster preparedness. The basic charge to the Office of Earthquake Studies was to develop scenarios of credible earthquake that would severely affect major California population centers, to estimate intensities for these events, and to indicate the approximate level of strong ground motion in the affected regions. This report presents estimates of ground motion based on current data and methods and is thought to be accurate. Nevertheless, the information in this report was prepared in an extremely short period of time, solely for the purposes of the National Security Council review. This report should not be taken to represent either a comprehensive

statement of earthquake hazard throughout California, or a definitive statement regarding the effects of any specific earthquake."[1]

In contrast to OFR 81-115 which was "prepared in an extremely short period of time" and "should not be taken to represent either a comprehensive statement of earthquake hazard throughout California or a definitive statement regarding the effect of any specific earthquake," the SONGS applicants and the NRC staff have spent several years conducting exhaustive investigations and reviews of the geology and seismology of southern California and particularly the SONGS region to determine the proper earthquake parameters.

Mr. Nader misrepresents the design of SONGS Units 2 and 3 in that he states the San Onofre Units 2 and 3 are only capable of withstanding a 6.5 magnitude earthquake. SONGS Units 2 and 3 are designed for a site-specific spectrum with a zero period anchor of 0.67g acceleration. This ground motion exceeds a conservative representation of the ground motion expected at the site from an occurrence of an M_s = 7.0 earthquake on the OZD at a distance of 8 km.

Mr. Nader's allegations also understate the design of SONGS Unit 1 in stating that Unit 1 is designed to withstand a 5.0 magnitude seismic event. The SONGS Unit 1 design basis earthquake is a Housner spectrum anchored at zero period by an acceleration of 0.5g. This design significantly exceeds the ground motion expected from a magnitude 5 earthquake at a distance of 8 km. Details

[1]In his testimony in the operating license proceeding for SONGS 2 and 3, James F. Devine, Assistant Director for Engineering Geology, USGS, reiterated that this report was not intended as a detailed report on the seismicity of the San Onofre site. See Transcript at 5328-31, 5408, 5429-31 (Docket Nos. 50-361 and 50-362, July 28, 1981). Moreover, the report was not admitted as evidence of seismicity in the area. Transcript at 5444-47 (July 29, 1981).

of the seismic capacity and program for upgrading SONGS Unit 1 are found in the response to the petitions by approximately 1560 Southern California residents. The response is an enclosure to the transmittal letter for this decision.

Mr. Nader asserts in paragraph three, items 3, 4, and 5 of his letter:

> "(3) Half the population of California would be affected by a serious accident at San Onofre. 10-12 million people live within 100 miles of the plant.
>
> (4) No workable or demonstrated evacuation plan exists for even the immediate 10 miles surrounding the plant. Typically, 25,000 people populate the San Onofre State Beach during the summer months. These people would be stranded in the event of a serious accident, because the only evacuation road passes right by the plant.
>
> (5) A June review by the Federal Emergency Management Agency (FEMA) concluded that the demonstration of the evacuation planning is 'woefully inadequate.' By the NRC's own reckoning (NUREG-0490) a meltdown accident at San Onofre could cause up to 130,000 acute deaths, and another 300,000 latent fatalities. Property damages, according to Science Applications, Inc., could be as high as $180 billion."

Presently, the licensee has in place an NRC-approved (October 1976) emergency plan for San Onofre Unit 1, which includes planning provisions for both onsite and offsite and accounts for population growth since the issuance of the construction permit for Unit 1 in 1964. A new proposed regulation was published in the Federal Register (44 FR 7516) on December 19, 1979, to clarify, expand, and further upgrade NRC's emergency planning regulations in 10 CFR Part 50, Appendix E. After public comments were received, a new regulation was issued with an effective date of November 3, 1980. In compliance with this regulation, the licensee submitted an updated emergency plan for NRC review in January 1981. In addition, the licensee submitted to the Federal Emergency Management Agency (FEMA), with copies to NRC, emergency plans for Orange and

San Diego Counties, the cities of San Clemente and San Juan Capistrano, the U.S. Marine Corps at Camp Pendleton, and the California State Department of Parks and Recreation.

The new regulation requires 10-mile radius emergency planning zones around nuclear power plants. The 10-mile radius area is referred to as the plume exposure pathway Emergency Planning Zone (EPZ) and applies to potential airborne exposure. Its size is based on a conclusion that it is unlikely that any protective actions would be required beyond the plume exposure pathway EPZ, given for most core-melt accidents. In addition, for worst-case core-melt accidents, acute fatalities would not be expected outside 10 miles. The detailed planning basis for this EPZ is described in the NRC/EPA Report, NUREG-0396, EPA 520/178-016, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants." The planning basis is also described in NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants."

A report by Science Applications, Inc. (SAI) was done for the California legislature and is the basis for a recommendation by the California Office of Emergency Services (COES) for extended emergency planning zones larger than the 10-mile EPZ. The risk study performed for the State of California is similar in many respects to those studies that were the basis for NUREG-0396, but one of the most important differences was the COES assumption that no protective actions would be taken offsite for seven days for those individuals in local areas of high radiation after cloud passage. The NRC staff believes that a more realistic exposure time is considerably shorter and that correspondingly smaller

planning distances should result from use of the COES methodology. The staff, however, has no objection to offsite authorities laying explicit plans for distances farther than 10 miles if those authorities choose to expend resources for this purpose. The staff's conclusion is that evacuation plans for the population beyond the 10-mile EPZ are not required and that evacuation plans within the 10-mile EPZ are adequate.

An analysis was prepared for the Southern California Edison Company by Wilbur Smith Associates, Traffic Engineers, entitled, "Analysis of Time Requirement to Evacuate Transient and Permanent Population From Various Areas Within the Plume Exposure Pathway Emergency Planning Zone, July 1981." This analysis, which considers the beach visitors, the number of cars and the routes, concludes that the evacuation time estimate for the general population of transient and permanent residents on a summer weekend is 2 hours for a radius of 2 miles from the plant, and 4.5 hours for a radius of 5 miles from the plant. The California State Department of Parks and Recreation has a revised "Nuclear Power Plant Emergency Response Plan for the San Onofre, San Clemente, and Doheny State Park and Beach Areas, December 1980" which details the evacuation routes and traffic control points. The Southern California Edison Company has installed sirens within the 10 mile emergency planning zone including all the beach areas. The sirens would be activated in the event of an accident at the plant that required people to take protective measures such as shelter or evacuation. With the traffic control, people to the north of the plant would only be allowed to evacuate to the north, and people south of the plant would be required to evacuate to the south; therefore, it would not be necessary for evacuees to pass by the plant.

An emergency exercise was enacted May 13, 1981, to demonstrate the Emergency Plan at SONGS. This exercise was witnessed by the NRC and FEMA and in a June 3, 1981 memorandum from FEMA to the NRC, FEMA states, in part, that:

> "A joint exercise was conducted on May 13, 1981, to evaluate the off-site capabilities of the State and local jurisdictions to respond to a nuclear emergency at the San Onofre station. The exercise reflected a general overall state of preparedness to implement general emergency plans."

In an enclosure to that memorandum (at pages 2 and 6), it is further stated that:

> "On May 13, 1981, FEMA Region IX with support from FEMA headquarters, Regions VIII and X, and the RAC [Regional Assistance Committee] conducted an evaluation of the offsite capabilities of the local, and State, jurisdictions to respond to a nuclear emergency at SONGS. The evaluation preparation, conduct, and subsequent critique process closely followed guidance provided by FEMA National program office. The findings of that evaluation reflected a general overall preparedness to implement their plans and to respond to the scenario from an operational standpoint, but significant shortfalls were observed in the ability to conduct radiological response operations. Further, the critical areas of ingestion pathway sampling and analysis, as well as Reentry and Recovery operations were not observed due to the restricted nature of the scenario. Communications, EOF facility, and general coordination were also considered to be weak and need further address through training and drill efforts. The evacuation portion of the exercise was considered adequate but was felt it did not totally test the evacuation requirement, and therefore, reflected a need for further study, drill, and exercise....
>
> A range of protective actions has been developed for the plume exposure pathway EPZ for both emergency workers and the public. Guidelines for the choice of protective actions during an emergency are developed and in place. Protective actions for the ingestion exposure pathway EPZ, appropriate to the locale, are generally developed. Further development and testing of these guidelines is recommended, but do not impose an impediment to the total response capability."

In summary, FEMA found the State and local government emergency response plans "minimally adequate," but found the offsite capability for implementation inadequate pending taking of corrective action. In a letter dated June 26, 1981,

to the NRC, the Southern California Edison Company (SCE) stated that a series of meetings had been held with FEMA and with all local jurisdictions to develop a plan of action for the continuing development of emergency preparedness. The plan and its schedule for implementation are described in Appendix B. FEMA in a July 14, 1981 memo from R. Jaske to B. Grimes of the NRC states that they have confirmed with FEMA Region IX that SCE's letter of June 26 represents agreed positions concerning FEMA's major concerns, what needs to be done to correct them, and SCE's proposed actions to assist in correcting them. The NRC staff has reviewed the corrective action proposed by the licensee to address the FEMA determinations and concluded that when completed these actions will adequately resolve the expressed concerns. Accordingly, in an October 26, 1981 letter the NRC advised SCE that the deficiencies identified by FEMA must be resolved and SCE must clearly demonstrate that the deficiencies have been corrected before the staff can complete its assessment of the overall state of emergency preparedness with respect to Unit 1. SCE stated in a letter to FEMA dated October 15, 1981, that they have completed all of the items of concern identified in the June 26 letter. FEMA is reviewing the October 15, 1981 letter and is expected to make a final determination on the adequacy of these actions in mid-November 1981. In view of the NRC staff's previous evaluation of the current emergency plan, the present efforts to further upgrade the emergency preparedness at San Onofre, and the schedule to meet FEMA's concerns in the near-term, there is no unacceptable risk to the health and safety to the public that would justify an order to shut down San Onofre Unit 1.

Mr. Nader quotes the values of acute fatalities (130,000) and latent fatalities (300,000) from a supplement to the Draft Environmental Statement (DES) for San Onofre Units 2 and 3. The calculations did not apply to Unit 1. In addition,

the Final Environmental Statement for Units 2 and 3 (NUREG-0490) states that for serious accidents with the low probability of 10^{-8}, the values of acute fatalities is 30,000 and latent cancers for 80 km/total is 12,000/24,000. For the very low probability accidents having the potential for causing radiation exposure above the threshold for acute fatality at distances beyond 16 km (10 mi), it would be reasonable to expect that authorities would evacuate persons at all distances at which such exposures might occur, even though planning for such a contingency is not required. Acute fatality consequences would therefore reasonably be expected to be very much less than the numbers shown. See Appendix A, Tables 1 and 2.

Mr. Nader quotes a "property damage" value of $180 billion from a Science Applications, Incorporated study. This value is from Table 11-24 A, and is, as in the use of the values for health effects, also for a release from San Onofre Unit 2 or 3. The value is not appropriate for San Onofre Unit 1 because of the lower inventory of radioactive material in the Unit 1 reactor core.

Mr. Nader asserts in paragraph four of his July 10, 1981 letter that:

> "New seismic information, unavailable in 1969 when Unit I was licensed, underscores the gravity of the situation. In 1980, a new fault zone, the Christianitos Zone of Deformation (CZD) was discovered and mapped by the U.S. Geological Survey at the request of the NRC. Traces of both this fault and the Newport-Inglewood fault pass precipitously close to the plant. Had this information been known in 1969, it is doubtful that the AEC could or would have licensed the Unit I reactor."

Although not identified as the Cristianitos Zone of Deformation (CZD), a feature aligned along the CZD known as Fault E, which is not part of the present day mapped Cristianitos Fault, was identified and mapped in 1971 by Marine Advisors Associates, consultants to the Southern California Edison Company. The fault

was removed from their 1972 maps because further interpretation did not substantiate a continuous fault, but rather a discontinuous zone of deformation.

A detailed investigation was made in 1980 by Southern California Edison at the request of the NRC, assisted by the U.S. Geological Survey (USGS), to determine the offshore extent of the Cristianitos Fault and to determine whether it is structurally related to the Offshore Zone of Deformation (OZD) of which the Newport-Inglewood fault is a part. The closely spaced, high resolution seismic reflection profiles taken offshore of the SONGS site revealed a zone of discontinuous, en-echelon faults and folds which were collectively referred to as the CZD. The CZD is not seen in the sea cliff exposure along its projected trend. Also, a Pleistocene erosion platform, which is believed to be 40,000 to 80,000 years old, can be seen in the seismic reflection profiles to overlie, undisturbed, the CZD. Since this would indicate that the CZD has not moved for at least that period of time, it is considered to be noncapable and does not present a hazard to the SONGS site. (See NUREG-0712, Section 2.5.1.12)

In paragraph five Mr. Nader asserts:

> "Furthermore, the Unit I reactor is plagued with very serious safety problems. In operation over 13 years, it was shut down in April 1980 due to severe leakage and corrosion in its steam generators. Pacific Gas and Electric (sic) claims that the damage has been corrected through the use of an unprecedented plugging and sleeving process, but even the NRC admits that the $67 million operation was 'highly experimental.' This means that Unit I is not only externally incapable of withstanding a serious quake produced by the Newport-Inglewood fault, but that internally it is highly susceptible to any major ground motion. These conditions, in such a densely populated area, are clearly intolerable."

The steam generator tube leakage at the time of the April 1980 shutdown was 270 gallons per day. This was considerably less than the allowable leak rate

limit of 430 gallons per day permitted by the Plant Technical Specifications. Subsequent inspections revealed the cause of the leakage to be intergranular corrosion attack of the tubing at the top of the tubesheet elevation. The extent of intergranular corrosion attack was found to be general throughout the central regions of the tube bundles where substantial sludge had accumulated on the tubesheet. Approximately 60% of the steam generator tubes needed repair based upon the inspection results.

General industry practice for performing tube repairs has and continues to be the plugging of the affected tubes on both the inlet and outlet sides, thereby effectively removing these tubes from service. However, the plugging of each of the tubes requiring repair during the April 1980 outage would have resulted in excessive loss of available heat transfer area. For this reason, Westinghouse and Southern California Edison developed a sleeving repair technique as an alternative to lugging. The advantage of sleeving, as opposed to plugging, is that it allows repaired tubes to remain in service. Similar sleeve repairs have been performed previously at other plants (Palisades in 1978 and R. E. Ginna in 1980), but for a much smaller number of tubes.

Sleeve repairs involve the insertion of a smaller diameter tube (i.e., the sleeve) into the tube to be repaired. The sleeve is inserted until it spans the affected region of the affected tube, and a sleeve to tube joint is formed at the upper and lower ends. The San Onofre sleeves were designed to function as the primary pressure boundary, with no credit taken for the remaining strength of the affected tube wall. Like the original tubing, the sleeves have been designed and analyzed in accordance with Section III of the ASME Boiler and

Pressure Vessel Code and applicable regulatory guides. The governing load conditions included the differential pressure loadings and differential thermal expansions (between tubes) associated with design, test and faulted [e.g., Loss-of-Coolant Accident (LOCA) or Main Steam Line Break (MSLB)] conditions. Seismically induced loadings are not a governing load condition for steam generator tubing except at the upper support plate and U-bends. The recent corrosion problems and sleeves are located at the tubesheet where the seismic-induced loadings are reported to be very small.[2] The structural integrity of the tubing at the more limiting upper support plate and U-bend locations has been verified previously by the licensee on the basis of the 0.67 g ground motion earthquake prescribed by the NRC.[3]

The steam generator repair programs implemented during the April 1980 outage at San Onofre Unit 1 has been evaluated by the staff and found to be acceptable.[4]

Southern California Edison has implemented a number of corrective measures to retard the rate of further corrosion. These include the use of secondary side hot and cold water soaks, stricter surveillance and control of the secondary water chemistry, and reduced temperature operation. The San Onofre steam generator tubes, including the sleeved tubes, will be inspected at regular intervals as required by the Plant Technical Specifications. San Onofre Unit 1 has a license condition to perform the first such inspection within six effective full power months following restart from the April 1980 outage.[5] Any additional

[2] Westinghouse Report No. SE-SP-40(80), Revision 1, "Steam Generator Repair Report for Southern California Edison San Onofre Unit 1," March 1981.
[3] Southern California Edison letter to the staff dated February 14, 1977.
[4] Safety Evaluation by the Office of Nuclear Reactor Regulation supporting Amendment No. 55 to Provisional Operating License No. DPR-13, Southern California Edison Company, San Onofre Unit 1, Steam Generator Repair Program and Restart, Docket Number 50-206, June 8, 1981.
[5] See id.

corrosion will result in additional repairs and other corrective measures as appropriate.

III

On the basis of the foregoing, I have determined that no adequate basis exists for ordering the suspension of the operating license for San Onofre Nuclear Generating Station, Unit 1. Mr. Nader also requested that the Commission conduct a "license review" for Unit 1. The staff has been conducting a comprehensive review of Unit 1 under the auspices of the NRC's Systematic Evaluation Program (SEP). The SEP is a program begun in 1978 by the NRC to review the licensing basis of older operating facilities, including San Onofre Unit 1, in order to provide: (1) documentation regarding comparison of the facility with current criteria on significant safety issues (topics) and a rationale for acceptable departures from these criteria, (2) integrated and balanced decisions with regard to any required backfitting, and (3) a safety assessment suitable for use in considering a conversion of a Provisional Operating License to a Full-Term Operating License where applicable, as for San Onofre Unit 1. The SEP topic review for San Onofre Unit 1 was about 72% complete as of September 30, 1981. The draft safety evaluation providing the results of the review is presently targeted for summer 1982. I believe that the SEP review essentially meets Mr. Nader's concern that the Commission reassess the licensing basis for older plants like San Onofre Unit 1. However, I have not found that there is a basis to suspend operation at this time during performance of the SEP review. Consequently, Mr. Nader's request is denied.

A copy of this decision will be filed with the Secretary of the Commission for review in accordance with 10 CFR 2.206(c) of the Commission's regulations. As provided in 10 CFR 2.206(c), this decision will constitute the final action of the Commission twenty-five (25) days after the date of issuance, unless the Commission, on its own motion, institutes the review of this decision within that time.

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 16 day of November, 1981

Attachments:
Appendices A and B

APPENDIX A

The following tables summarize some of the results relating to the calculated consequences of severe accidents postulated at the San Onofre Nuclear Generating Station Unit 1 site. The calculations were performed as part of ongoing siting studies in support of siting rulemaking.

The results, shown in Tables 1 and 2, were based on a number of assumptions that were used in the modified version of CRAC code. The definitions of accidents and the evacuation scenarios used in the calculations are shown in Table 3.

For San Onofre 1 site the calculations used: (1) closest meteorological station at Sante Marie, California, (2) 1970 census population data, and (3) 1347 MWt power level.

In Table 1 the model assumes evacuation to 10 miles only. In Table 2 the model assumes evacuation to 20 miles. In Tables 1 and 2 the Evacuation Scenario 1 is referred to as "best," Scenario 7 (30%, 40%, 30% weighing of Scenario 1, 2, and 3) is referred to as "Summary," and Scenario 5 (which is based on a 24-hour acute dose) is referred to as "No" evacuation. These scenarios are described in Table 4.

Figures for latent cancer fatalities in the row labeled "Initial" are due to whole body dose from initial exposure, while those labeled "Total" are an

integral of latent cancers for all age groups exposed for their remainder of respective lifetimes.

Table 1: Calculated Consequences of Accidents at San Onofre Unit 1 Using Actual Power Level of 1347 MWt Evacuation Out to 10 Miles

	SST-1			SST-2			SST-3		
	Mean	Peak	Prob. of Peak	Mean	Peak	Prob. of Peak	Mean	Peak	Prob. of Peak
"Summary"* Evacuation									
Acute Fatalities	0.0339	126	4.79×10^{-10}	0	0		0	0	
Acute Injuries	17.7	22,200	4.79×10^{-10}	0	0		0	0	
"Best"* Evacuation									
Acute Fatalities	0.0339	126	4.79×10^{-10}	0	0		0	0	
Acute Injuries	14.3	22,200	4.79×10^{-10}	0	0		0	0	
"No"* Evacuation									
Acute Fatalities	4.64	2,900	7.01×10^{-10}	0	0		0	0	
Acute Injuries	122	22,200	4.79×10^{-10}	0	0		0	0	
Latent Cancer Fatalities**									
Initial	152	2,260	2.20×10^{-8}	6.18	84.2	2.20×10^{-8}	0.0371	0.401	2.35×10^{-8}
Total	1490	14,100	1.52×10^{-8}	78.5	872	7.61×10^{-10}	0.219	1.66	7.61×10^{-10}

* See Table 4.
**Based upon "Worst" Evacuation of Table 4.

Table 2: Calculated Consequences of Accidents at San Onofre Unit 1 Using Actual Power Level of 1347 MWt Evacuation Out to 20 Miles

	SST-1		
	Mean	Peak	Prob. of Peak
"Summary"* Evacuation			
Acute Fatalities	0	0	-
Acute Injuries	2.3	1,700	3.2×10^{-9}
"Best"* Evacuation			
Acute Fatalities	0	0	-
Acute Injuries	5.2×10^{-2}	270	6.2×10^{-10}
"No"* Evacuation			
Acute Fatalities	4.64	2,900	7.01×10^{-10}
Acute Injuries	122	22,200	4.79×10^{-10}
Latent Cancer Fatalities**			
Initial	130	2,300	1.5×10^{-8}
Total	1,100	14,000	9.8×10^{-9}

*See Table 4.
**Based upon "Worst" Evacuation of Table 4.

Table 3: Assumptions for Siting Analysis

Release Category	Probability (reactor-yr)$^{-1}$	Time of Release (hr)	Release Duration (hr)	Warning Time (hr)	Release Height (meters)	Release Energy
SST 1	1×10^{-6}	1.5	2	0.5	10	0
SST 2	2×10^{-6}	3	2	1	10	0
SST 3	5×10^{-6}	1	4	0.5	10	0
SST 4	1×10^{-3}	0.5	1	-	10	0
SST 5	5×10^{-3}	0.5	1	-	10	0

	Accident Type	Nature of Containment Leakage
SST 1	Core Melt	Large, Overpressure failure
SST 2	Core Melt	Large, H_2 Explosion or Loss of Isolation
SST 3	Core Melt	~ 1%/day
SST 4	Gap Release	~ 1%/day
SST 5	Gap Release	~ 0.1%/day

Table 4: Emergency Response Scenarios

			Distance Evacuated	Time before Evacuations	Rate of Evacuation
("Best")	1.	Evacuation	10 Miles	1 hr Delay	10 mph
	2.	Evacuation	10 Miles	3 hr Delay	10 mph
	3.	Evacuation	10 Miles	5 hr Delay	10 mph
	4.	Sheltering	10 Miles	6 hr Relocation	Regional Sheltering Facilities
("No")	5.	No emergency response (24 hr acute dose)			
("Worst")	6.	Evacuation	10 Miles	5 hr Delay	1 mph
("Summary")	7.	Evacuation summary (30%, 40%, 30% weighting of 1, 2, 3)			

APPENDIX B

CORRECTIVE ACTIONS REQUIRED TO ADDRESS FEMA DETERMINATIONS OF JUNE 3, 1981*

FEMA CONCERNS	FEMA RECOMMENDATION	RESPONSE**
FEMA Region IX Evaluation of Plans and Capabilities		
"Most Critical Concern"		
1. The assessment and monitoring of actual offsite radiological consequences of a radiological emergency condition through methods, systems and equipment is considered to be weak and in need of improvement to meet minimum criteria.	Develop a multi-jurisdictional response capability to assure adequate coverage of plume pathway and standardized procedures which allow flexibility in response.	Continue to install the Health Physics Computer which will provide a prompt conservative assessment of the actual radiological consequences of an accident. This will be operational to a limited degree by fuel load with full operation expected by July 1982. Further develop standard radiological monitoring procedures (SOP's) for the local jurisdictions and the Offsite Dose Assessment Center (ODAC) by August 1981. SCE additionally will assess the local jurisdictions' current equipment against their needs and identify any deficiencies noted. SCE will provide staffing to assume a role of leadership in this function. SCE will provide training programs for personnel involved in use of the SOP's.
"Serious Concern"		
2. The interim - EOF shows a lack of clear operating procedures, fragmentation of the facility, lack of management direction communications, size of the facility, and is a significant impedance to the San Clemente EOC operation.	Until the permanent EOF is completed, the interim EOF should be relocated to a single location separate from the San Clemente EOC and staffed with management, communicators and other support personnel necessary for EOF operations.	SCE will develop SOP's to make current EOF operations clearer and more manageable along the lines of the current planning arrangements. Limited physical improvements of the present facilities will be identified and accomplished.

*The schedule for these actions is identified in pages B-4 and B-5.

**As a result of a meeting between FEMA and SCE on June 15, 1981, it is SCE's understanding that the significant concerns addressed in the FEMA Region IX Evaluation of the May 13, 1981 Exercise are covered in these planned actions.

FEMA CONCERNS	FEMA RECOMMENDATION	RESPONSES
"Major Concerns"		
3. A need to clarify monitoring and assessment duties for both plume and ingestion pathways as they pertain to State OES, State Radiological Health and local jurisdiction.	Develop a joint standardized multi-jurisdictional response team.	(See item [1] above.) SCE will develop standardized procedures for the five involved counties to obtain samples, conduct analyses, and take necessary protective actions for the ingestion pathway emergency planning zone consistent with the State Radiological Health proposed ingestion pathway procedures. Develop an integrated radiological response team to be directed by the Offsite Dose Assessment Center (ODAC) to conduct field monitoring.
4. Means to provide early notification and clear instructions to the public within the plume exposure pathway EPZ have not been installed or tested.	Install sirens and provide warning dissemination capacity to remote areas where public address systems from surface or airborne vehicle is required.	SCE will proceed with current plans for siren installation. SCE will develop SOP's for public notification via the Emergency Broadcast System (EBS) and local stations identified in the plans. SCE will develop SOP's for coordination and decisionmaking in use of sirens.
5. Adequate emergency facilities and equipment to support the emergency response have not been provided.	SCE provide response equipment which was promised to the local jurisdictions, including sirens and additional communications equipment.	Agreements have been made between SCE and local agencies that specific equipment will be ordered by the local jurisdictions and billed to SCE. Equipment procurement has begun and is continuing. SCE will follow up with report on status of equipment received or on order. SCE will review equipment needs and status of equipment procurement activities.
6. Radiological emergency response training has essentially not been provided to those who may be called upon to assist in an emergency.	SCE, in conjunction with the State of California, should develop the necessary training to meet the identified needs in the local jurisdictions.	(See items [1] and [3] above.) SCE will develop and implement a program of training in the critical areas of radiation monitoring and assessment, communications, decisionmaking and coordination regarding protective actions, etc.

	FEMA CONCERNS	FEMA RECOMMENDATION	RESPONSES
	"Sufficient Concern to Remain a Major Issue"		
7.	SCE has not made information available about how the public would be notified or what the public's initial actions should be in an emergency.	Disseminate advance public information.	SCE will proceed with the public education program that includes an emergency response brochure and radiation information brochure mailer, preparation and distribution of flyers and posters, new ads, community meetings, etc.

SUMMARY OF PLANNED ACTION

	SCHEDULE
1. Develop SOP's covering the following topics:	Items (a) through (h):
a. Operation of the Offsite Dose Assessment Center (ODAC)	1st draft - 7/15/81 Final draft - 9/1/81 Implement - 10/1/81
b. Radiation surveys by field monitoring teams	
c. Emergency Communications	
d. Use of the [illegible] alerting system and public notification	
e. Coordination relating to protective actions	
f. Acquisition, display and use of meteorological data	
g. Operation of the EOF	Item (i):
h. Ingestion pathway monitoring	1st draft - 9/15/81 Final draft - 11/1/81 Implement - 12/1/81
i. Existing SOP's covering other plan elements	
2. Obtain equipment required to carry out radiation monitoring functions	
a. Survey types and quantities of equipment actually in place	7/15/81
b. Initiate procurement of equipment shortages	8/1/81
3. Develop additional communications capability	
a. Expand interagency phone network to include CHP	7/15/81
b. Provide speaker monitors at EOC's	7/15/81
c. Provide teletype message system network between all principal centers	10/15/81
d. Provide additional communication circuits	10/15/81

		SCHEDULE
4.	Make physical improvements to the EOF	
	a. Identify possible improvements	9/1/81
	b. Obtain agreements to make improvements	9/1/81
	c. Construct improvements	10/15/81
5.	Install Sirens	50% by 7/1/81 90% by 9/1/81 100% by 10/15/81
6.	Accomplish training in use of new and existing procedures, facilities, and equipment	
	a. Develop training program (long and short term)	7/15/81
	b. Develop training material (short term program)	9/1/81
	c. Conduct training and drills (short term program)	9/1/81 through 10/15/81
	d. Implement long term training program	11/1/81 through 2/1/82
7.	Public Information Program	Ongoing, Initial program complete 9/1/81

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ATTACHMENT 4

U.S. Nuclear Regulatory Commission
1717 H Street, N.W., 11th Floor
Washington, D.C. 20555

Nunzio J. Palladino, Chairman
Victor Gilinsky, Commissioner
Peter A. Bradford, Commissioner
John A. Ahearne, Commissioner

July 10, 1981

Gentlemen:

It has been over a year and a half since the Kemeny and Rogovin Commissions published their sharp criticism of the Nuclear Regulatory Commission's (NRC) approach to regulating nuclear power. Investigating the accident at Three Mile Island, both groups concluded that the NRC's attitude of promoting nuclear energy and protecting the nuclear industry had had a negative impact on public safety.

Despite these strong indictments, however, the NRC has returned to the same "business as usual" attitude that characterized its pre-TMI behavior. Perhaps nowhere is this attitude more obvious than in the case of the San Onofre-atomic facility, to which I would like to call your attention.

The San Onofre Nuclear Generating Station (SONGS) is situated in a seismically volatile and densely populated area of Southern California, making it among the most ill-conceived and dangerous nuclear power plants in America. Yet, the NRC's Atomic Safety and Licensing Board (ASLB) continues to push ahead in its efforts to license San Onofre Units II and III, while ignoring the extremely serious safety issues surrounding the continued operation of Unit I:

1) San Onofre Unit I has been identified as having the highest probability of a meltdown of any reactor in California, according to a study prepared by Science Applications, Inc., for the California Office of Emergency Services.

2) The Newport-Ingelwood Fault, only four miles offshore, is capable of a 7.5 magnitude earthquake, according to the U.S. Geological Survey. A 7.5 magnitude quake is ten times greater than the 6.5 magnitude quake that San Onofre Units II and III are theoretically capable of withstanding. By comparison, Unit I is designed only to withstand a 5.0 magnitude seismic event!

3) Half the population of California would be affected by a serious accident at San Onofre. 10-12 million people live within 100 miles of the plant.

4) No workable or demonstrated evacuation plan exists for even the immediate 10 miles surrounding the plant. Typically, 25,000 people populate the San Onofre State Beach during the summer months. These people would be stranded in the event of a serious accident, because the only evacuation road passes right by the plant.

5) A June review by the Federal Emergency Management Agency (FEMA) concluded that the demonstration of the evacuation planning is "woefully inadequate." By the NRC's own reckoning (NUREG-0490) a meltdown accident at San Onofre could cause up to 130,000 acute deaths, and another 300,000 latent fatalities. Property damages, according to Science Applications, Inc., could be as high as $180 billion.

New seismic information, unavailable in 1969 when Unit I was licensed, underscores the gravity of the situation. In 1980, a new fault zone, the Christianitos Zone of Deformation (CZD) was discovered and mapped by the U.S. Geological Survey at the request of the NRC. Traces of both this fault and the Newport-Ingelwood fault pass precipitously close to the plant. Had this information been known in 1969, it is doubtful that the AEC could or would have licensed the Unit I reactor.

Furthermore, the Unit I reactor is plagued with very serious safety problems. In operation over 13 years, it was shut down in April, 1980 due to severe leakage and corrosion in its steam generators. Pacific Gas and Electric claims that the damage has been corrected through the use of an unprecedented plugging and sleeving process, but even the NRC admits that the $67 million operation was "highly experimental." This means that Unit I is not only externally incapable of withstanding a serious quake produced by the Newport-Ingelwood fault, but that internally it is highly susceptible to any major ground motion. These conditions, in such a densely populated area, are clearly intolerable.

It is time for the NRC to live up to its legal, as well as moral, responsibility, which is quite simply to regulate nuclear power in order to protect public health and safety. The circumstances that led to the licensing of Unit I in 1969 are no longer applicable today. New seismic dangers have been uncovered, the population has grown at an astounding rate, and the reactor's equipment is deteriorating. An operating license, once issued, is not an inalienable right that cannot be revoked. Instead, it is like a driver's license, which is granted by the NRC under certain conditions, and is subject to periodic review and possible revocation.

I urgently request that the commissioners initiate a license review for San Onofre Nuclear Generating Station Unit I, and that, until such time as a review has been completed, operation of Unit I be suspended. Over 1,500 concerned residents of Southern California have petitioned the Director of Nuclear Reactor Regulation of the NRC between 1979-1980 to initiate proceedings pursuant to 10 CFR 2.202 and 10 CFR 55.40 for the purpose of suspending or revoking the operating license for the San Onofre Nuclear Generating Station Unit I. They have not, as yet, received a reply.

Given the gravity of the issues surrounding the facility in question and in accordance with the petitioners, I respectfully request prompt action be taken to address these crucial matters. Failure by the NRC to take action will not only confirm the widespread suspicion that the agency has failed to correct its mistakes of the past, but more importantly, will endanger the security of millions of people living in Southern California.

Sincerely,

Ralph Nader

Ralph Nader

cc: Gov. Jerry Brown