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 EISENHUT, D. G. Office of Nuclear Reactor Regulation, Director

SUBJECT: Responds to Generic Ltr 82-33 (NUREG-0737, Suppl 1) re  
 emergency response capability requirements. Progress in areas  
 of safety parameter display sys, detailed control room design  
 reviews & emergency response facilities summarized.

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May 13, 1983

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Director, Office of Nuclear Reactor Regulation  
Attention: Mr. Darrell G. Eisenhut, Director  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362  
San Onofre Nuclear Generating Station  
Units 2 and 3

Reference: Letter, D. G. Eisenhut, NRC, to All Licensees of Operating  
Reactors, Supplement 1 to NUREG-0737 - Requirements for  
Emergency Response Capability (Generic Letter No. 82-33),  
December 17, 1982

The reference letter transmitted Supplement 1 to NUREG-0737 which  
provides additional clarification of NRC requirements in the following five  
areas:

- I. Requirements for Emergency Response Capability - regarding Safety  
Parameter Display Systems,
- II. Detailed Control Room Design Reviews,
- III. Regulatory Guide 1.97 (Revision 2) and Meteorological Data,
- IV. Upgrade of Emergency Operating Procedures, and
- V. Emergency Response Facilities.

In addition, the letter requested that each licensee submit a proposed  
schedule for completing each of the basic requirements for the items  
identified in the enclosures to the letter. Southern California Edison (SCE)  
is providing this letter in response to that request. By letter dated  
April 13, 1983, SCE advised the NRC that company resources were involved in  
resolution of important issues restraining SONGS 2 power operation and as such  
SCE's response to the reference letter would be delayed to May 15, 1983.

Due to the construction and licensing status of San Onofre Nuclear  
Generating Station, Units 2 and 3 (SONGS 2 and 3) at the time the TMI  
requirements were issued (NUREG-0737), SCE addressed those requirements in the  
Final Safety Analysis Report and in separate letters to the NRC. TMI items  
that have been reviewed and approved by the NRC are addressed in the Safety  
Evaluation Report and supplements thereto issued by the NRC. In a few cases,  
this early effort by SCE has resulted in some differences between SONGS 2  
and 3 facilities and the final guidance issued by the NRC in Supplement 1 to  
NUREG-0737. SCE will rely on the NRC commitment to make allowances for the  
work done in a good faith effort.

Boo!

The following information addresses each of the five major categories identified in Supplement 1 to NUREG-0737.

### I. Safety Parameter Display System (SPDS)

The SPDS for SONGS 2 and 3 is described in the emergency support facilities submittal enclosed with SCE's letter from Mr. K. P. Baskin to Mr. F. A. Miraglia (NRC) dated March 31, 1982. In addition, a report on the SPDS was also sent by letter from Mr. Baskin (SCE) to Mr. Miraglia (NRC) dated May 13, 1982 addressing the recommendations of Regulatory Guide 1.97.

As designed the SONGS 2 and 3 SPDS meets and complies with the requirements of Supplement 1 to NUREG-0737. Those requirements are actually exceeded by the SONGS 2 and 3 SPDS. The system is comprised of two independent display systems. One system is a non-qualified primary display, which is the Critical Functions Monitoring System (CFMS). The other system is a Class 1E redundant seismically qualified backup display, the Qualified Safety Parameter Display System (QSPDS).

These two independent, yet integrated data acquisition systems are able to display information required by the reactor operations personnel in the Control Room (CR) and also to support personnel in both the Technical Support Center (TSC) and the Emergency Operations Facility (EOF). Human factors engineering was considered in the design of the SPDS.

Equipment for the CFMS and QSPDS display variables associated with inadequate core cooling (ICC) instrumentation as follows:

- A. Subcooled margin monitor (SMM) upgrade external to the reactor vessel (up to 500F super heat),
- B. Core exit thermocouple upgrade (to post-LOCA environment), and
- C. Reactor vessel level monitoring system installation (to be verified and validated during the first fuel cycle).

Unit 3 has the upgraded CFMS and QSPDS equipment with the full complement of ICC instrumentation already installed. Unit 2 has the original CFMS and SMM already installed. The QSPDS and ICC upgrades listed above (Unit 2) and the additional SPDS and RG 1.97 Rev. 2 (Units 2 and 3) upgrades described in SCE's letter from K. P. Baskin to G. W. Knighton (NRC) dated October 28, 1982 will be installed prior to startup following the first refueling outage for each unit.

### II. Control Room Design Review (CRDR)

SCE has performed a Control Room Design Review (CRDR), and the NRC has conducted a 4-day human factors engineering audit for SONGS 2 and 3.

The SCE CRDR was performed by a ten member working group including representatives from:

- o SCE - Engineering and Operations
- o Combustion Engineering - NSSS
- o Bechtel Power Corporation - Engineering
- o Whitston Associates - Human Factors Engineering

The above multi-disciplinary team included a representative from operations with reactor operator experience and several human factors engineers. The human factors review considered various aspects of the control panels. Included in the review was display grouping and arrangement, and use of color in the arrangement to improve operator recognition. In conducting the review, full scale panel mock-up sections were built and used to aid in determining preferred color arrangements and operator flow path during emergency procedures.

As a result of the CRDR, a number of areas were identified for human factors improvement or correction. The following recommendations were implemented prior to fuel load.

A. Annunciator System

1. Implement prioritization of alarms by use of colored annunciator windows.
2. Add a master mimic on the Primary Energy Panel (CR-50) to identify the panel section on which an incoming alarm is located.
3. Delete the master acknowledge and reset capability.

B. Labeling and Instrument Coding

1. Correction of labeling errors, inconsistencies in terminology, provision of missing labels, and elimination of shadowing by instruments.
2. Implement a hierarchical labeling scheme to identify panel section, systems, subsystems, component, and group levels.
3. Eliminate redundancy of information on component labels, legends on backlighted pushbuttons, and status indicating lights.
4. Relocate labels from the present location at the bottom of the component to the top.
5. Identify the operating range, alarm range, and technical specification limits on instruments where applicable.

C. Operator Instructions

1. Perform walk-throughs of emergency instructions to verify adequacy of instructions.
2. Revise emergency instructions as required to improve clarity and uniformity of format.
3. Emergency operating procedures have been developed and the instrumentation and controls have been reviewed to verify the operators' ability to carry out both the normal and emergency operating procedures.

D. Control Panels and Instrumentation

1. Provide demarcation of control panels by functional system utilizing bezel color coding.
2. Relocate approximately 150 components on the control panels to improve relative location of instruments, eliminate mirror images, and increase the capability for safe operation of the auxiliary feedwater control.
3. Provide color coded pattern recognition charts for use during emergency operation.

E. Miscellaneous

1. Install a guard rail on the control panels.
2. Complete the environmental data collection and evaluation activities for noise and lighting, with emphasis on minimizing glare.
3. Prioritization of the plant computer alarm index.

In addition to the SCE CRDR, the NRC performed a four day audit of the San Onofre Nuclear Generating Station Unit 2 Control Room, focusing on:

- o Control and display design and location
- o Work station layout, including visibility and reach
- o Control room environment, specifically noise and illumination.

The NRC identified several concerns as a result of their audit. These concerns are identified in Supplement 1 of the Safety Evaluation Report for SONGS 2 and 3. SCE has implemented all the currently due corrective actions relative to the NRC's concerns. The only remaining action item relates to control room lighting and is required at first refueling. SCE considers that the current SONGS 2 and 3 control room design is consistent with the requirements of Supplement 1 of NUREG-0737.

### III. Regulatory Guide 1.97 - Application to Emergency Response Facilities (ERF)

Compliance with the recommendations of Regulatory Guide 1.97 (RG 1.97) has been addressed in SCE's letter to the NRC dated May 13, 1982 which is referenced in Item I above. Implementation of RG 1.97 at SONGS 2 and 3 is provided through the Health Physics Computer System (HPCS) and the upgraded CFMS and QSPDS equipment previously discussed in Item I.

The HPCS handles most of the Type E variables listed in RG 1.97 including meteorology. The upgraded CFMS and QSPDS handle Type A, B, C, D and some E variables.

The HPCS is presently operational for Units 2 and 3 to perform the ERF radiological monitoring function. The HPCS and the CFMS and QSPDS as described in Item I will be upgraded to implement the RG 1.97 function prior to startup following the first refueling outage.

The meteorological monitoring system at SONGS provides analog data readout for the RG 1.97 parameters, wind direction, wind speed and atmospheric stability (vertical temperature difference) in both Unit 1 and Units 2/3 control rooms. The recording instrumentation meets the RG 1.97 requirements for ranges in all cases with the exception of the vertical temperature difference range. The present configuration at SONGS has an operating range of  $+3.0^{\circ}\text{C}$  whereas RG 1.97 stipulates  $-5^{\circ}\text{C}$  to  $+10^{\circ}\text{C}$ . The existing range of  $+3.0^{\circ}\text{C}$  exhibits better data resolution than the  $-5^{\circ}\text{C}$  to  $+10^{\circ}\text{C}$  range. Furthermore, the A and G stability classes are adequately defined by the existing system since, for a height interval of 30m (10 - 40m) which is the existing height interval at SONGS, 'A' stability class is defined as less than  $-0.57^{\circ}\text{C}$  while 'G' class is defined as greater than  $+1.20^{\circ}\text{C}$ . Data from this system were presented in the Unit 2/3 FSAR. Changing to the stipulated range would reduce data accuracy.

In an effort to meet the anticipated requirements stipulated in Regulatory Guide 1.23, Revision 1, and Appendix II to NUREG-0654, SCE has already completed extensive modifications to the meteorological monitoring system at SONGS. Included are the following:

- A. Installation of a backup meteorological tower.
- B. Upgrade of existing primary meteorological tower to include digital as well as analog data transmission, uninterruptible power supply (UPS), precipitation and dew point sensors.
- C. Formulation and implementation of a site-specific Class A dose assessment dispersion model which incorporates non-uniform wind, stability and mixing height fields.

At the present time, both primary and backup meteorological towers are operating at SONGS with data available in both Unit 1 and Units 2/3 control rooms, TSC's and EOF. Data recovery rates are consistently above 90 percent. In addition, procedures are in place to obtain offsite meteorological information from the National Weather Service.

#### IV. Upgrade Emergency Operating Procedures (EOP's)

By letter dated November 22, 1982, from Mr. R. K. Wells, Chairman CE Owners Group to Mr. Darrell G. Eisenhut, NRC, Emergency Procedure Guidelines (CEN-152, Revision 1) were transmitted for NRC review and approval. The guidelines were prepared by Combustion Engineering for the CE Owners Group. The submittal by the CEOG was made to assist the NRC and the CEOG members in reaching resolution of requirement I.C.1 of NUREG-0737 for CE designed nuclear steam supply systems.

The present emergency procedure guidelines contain increased technical information and guidance for dealing with unanticipated accidents, including multiple failures, and pressurized thermal shock. The report also provides optimal recovery paths, as guidelines, along with supporting information on their development.

The NRC advised the CEOG by letter dated February 4, 1983 of preliminary acceptance of the CEOG Emergency Procedure Guidelines for implementation in plant specific emergency procedures and outlined requirements for additional work in this area. The NRC identified technical and administrative issues which require timely resolution and required a program to manage future changes as the need is identified. The NRC review concluded that implementation of the guidelines should provide a greater assurance of operational safety than presently exists and the CE owners should proceed with plant-specific implementation.

SCE is currently in the process of converting the generic CEOG guidelines into plant-specific Emergency Operating Instructions (EOI's) for SONGS 2 and 3. The upgraded EOI's are scheduled to be implemented at Unit 2 and Unit 3 prior to startup following the

first refueling outage for each unit. Consistent with the requirements of Supplement No. 1 to NUREG-0737, SCE will submit to the NRC a procedure generation package for review at least three months prior to the date SCE plans to begin formal operator training on the upgraded EOI's.

V. Emergency Response Facilities (ERF's)

By letter from Mr. K. P. Baskin (SCE) to Mr. F. A. Miraglia (NRC) dated March 31, 1982, SCE submitted a functional description of the upgraded emergency support facilities at SONGS 2 and 3 in compliance with License Condition 2.C(19)s.1 to Facility Operating License NPF-10. In addition, by letter from Mr. Baskin to Mr. George W. Knighton (NRC) dated December 15, 1982, SCE advised the NRC that, with two exceptions, those emergency support facilities are operational in compliance with License Conditions Nos. 2.C(19)s.2 and 2.C(17)j.1 to Facility Operating Licenses NPF-10 and NPF-15, respectively. One of those exceptions, the CFMS display in the EOF, was not expected at that time to be operational by January 1, 1983. Due to an outage on SONGS 2, however, the work remaining on the CFMS was performed and the CFMS display in the EOF is now operational.

The remaining outstanding work item is the installation by the NRC of the red (Emergency Network System) and the green (Health Physics Network) telephones.

SCE plans to utilize a company owned facility in SCE service territory in Santa Ana, approximately 35 miles from the plant as the backup EOF. Arrangements have already been implemented to effect this plan. The use of the Santa Ana facility was determined to be appropriate based on space, communication facilities, and its proximity to the Orange County Emergency Operations Center which plays a key role in offsite decision making regarding public health and safety. Since the primary EOF at SONGS is designed to rigid habitability standards that far exceed NRC guidance, it is not envisioned that the primary EOF would need to be evacuated during an accident. On this basis, SCE considers that, with the exception of the distance to the backup EOF, the ERF's as described in the March 31, 1982 submittal and implemented at SONGS 2 and 3 meet the requirements of Supplement 1 to NUREG-0737.



May 13, 1983

Pursuant to 10 CFR 50.54(f), this letter satisfies the NRC request in the reference letter that licensees furnish, a proposed schedule for completing each of the basic requirements for the items identified in the enclosures to the letter. If you have any questions regarding this matter, please call me.

Subscribed on this 13<sup>th</sup> day of May, 1983.

Respectfully submitted,

SOUTHERN CALIFORNIA EDISON COMPANY

By: K. P. Baskin  
K. P. Baskin  
Manager of Nuclear Engineering,  
Safety, and Licensing

Subscribed and sworn to before me this  
13<sup>th</sup> day of May 1983.

Agnes Crabtree  
Notary Public in and for the County of  
Los Angeles, State of California

My Commission Expires: 8/27/86

