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SUBJECT: Forwards response to License NPF-10 condition C.(11) compliance w/Reg Guide 1.97,Revision 2.

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May 13, 1982

Director, Office of Nuclear Reactor Regulation
Attention: Mr. Frank Miraglia, Branch Chief
Licensing Branch No. 3
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

Southern California Edison has extensively reviewed the recommendations of Regulatory Guide 1.97 (Rev. 2) and has developed a position to comply with Operating License Condition C.(11) to submit a program and implementation schedule to meet RG 1.97 Rev. 2 for SONGS 2/3.

SCE considers that the enclosed report (63 copies are enclosed) addressing our compliances with RG 1.97, Rev. 2 satisfies Operating License NPF-10 condition C.(11). If you have any questions concerning this subject, please let me know.

Very truly yours,

K P Baskin

Enclosures

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RESPONSE TO OPERATING LICENSE NPF-10 CONDITION C (11)
COMPLIANCE WITH REGULATORY GUIDE 1.97, REV. 2

San Onofre Nuclear Generating Station

Units 2 and 3

May 13, 1982

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COMPLIANCE WITH REGULATORY GUIDE 1.92, REV. 2
SAN ONOFRE UNITS 2 AND 3

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I. INTRODUCTION

Southern California Edison has extensively reviewed the recommendations of Regulatory Guide 1.97, Rev. 2, December, 1980 and has developed a position to comply with Operating License NPF-10 Condition C(11) to submit a program and implementation schedule to meet RG 1.97 Rev. 2 for SONGS 2/3. The SONGS 2/3 original design basis addressed many of the RG 1.97 parameters, and post TMI modifications have been configured where possible for eventual application of post accident criteria. Consequently, the implementation program described herein is targeted towards reasonably meeting the intent of RG 1.97 with mimimum impact to SONGS 2/3 design. Should NRC reevaluation of the seismic qualification requirements for any portion of the RG 1.97 variables, such as those associated with inadequate core cooling (ICC), result in relaxation of these requirements, SCE may elect to appropriately modify certain aspects of the implementaion of our position as described herein.

II. COMPLIANCE POSITION

The differences between existing instrumentation and RG 1.97 recommendations are listed in Section III of this report with the basis for their resolution. Many of the potential differences were resolved by implementation of NUREG-0660 requirements through the purchase and installation of the Critical Function Monitor (CFM) Computer System and by implementation of NUREG-0737 through the purchase and planned installation of the Inadequate Core Cooling System (ICCS). The remainder of the RG 1.97 (Table 2) variables not specifically addressed in Section III are considered to be monitored consistent with the RG 1.97 recommendations by existing and planned plant instrumentation.

RG 1.97 splits the monitored variables into five types and three categories. For each type, different design requirements are imposed depending upon its category of importance. A summary of our position to meet RG 1.97 is provided in the following paragraphs.

TYPE "A" Variables

RG 1.97 defines TYPE "A" Variables to be those plant variables that provide primary information to allow operators to take manual action to accomplish safety functions where no automatic control is provided. Type "A" variables are not specified in RG 1.97; rather they are plant specific and each utility must designate its own list consistent with emergency operating procedures and long term post accident recovery scenarios. A list of designated TYPE "A" variables for SONGS 2/3 appears on the last page of Section III, and is repeated below:

Neutron Flux
RCS Hot Leg Temperature
RCS Cold Leg Temperature
RCS Pressure
Refueling Water Storage Tank Level
Containment Pressure
Containment Water Level
Hydrogen Concentration
Reactor Vessel Level Monitoring System
High Pressure Safety Injection Flow
Core Exit Thermocouples
Steam Generator Level
Steam Generator Pressure

The above list was developed from post-accident scenarios where operator action would be required as a result of observing one or more of these variables. This is a conservative interpretation of RG 1.97 for SONGS 2/3 since no operator action is required for 30 minutes following any design basis event and the plant will shut down automatically to a safe condition. However, in extended scenarios, manual operator action is required. As an example, when the hydrogen monitors indicate a build-up of hydrogen gas inside containment post-LOCA, the hydrogen recombiners are manually turned on. The above plant specific list is comparable to similar lists generated by other utilities, owner's groups and INPO.

The impact of labeling a variable TYPE "A" is that all instrumentation to monitor this type of variable becomes Category 1 and must meet safety grade instrumentation requirements. On SONGS 2/3, all the above listed instrumentation is already installed as or is planned to meet the Category 1 requirement, except for the neutron flux monitors. The neutron flux instrumentation would be upgraded to meet post LOCA environment.

Type "B", "C", "D" Variables

Type "B" - indicate safety function being accomplished

Type "C" - indicate the potential for being breached or the actual breach of barriers to fission product releases

Type "D" - indicate operation of systems important to safety

A review of the Type B, C, and D variables against existing instrumentation was conducted. Instruments to measure these variables are listed in RG 1.97 as being in either Categories 1, 2, or 3. Category 1 is safety grade. Category 2 is environmentally qualified and must be powered by a reliable power supply which may be a non-1E UPS. Category 3 is nuclear quality commercial grade.

The differences bewteen RG 1.97 recommendations and SONGS 2/3 capabilities are summarized in Section III with the basis for our position on each. In general, SCE considers that the intent of RG 1.97 can be met by using instrumentation that does not necessarily match every recommendation contained in Table 2 of that guide for PWR's. In particular, our position incorporates the following generically stated exceptions with our bases provided in Section III for the specific instrument channels that are different from the RG 1.97 Table 2 recommendations:

(A) Where the intent to provide monitoring of a variable is reasonably met by an existing, reliable instrument, the need to make minor range changes to meet RG 1.97 specifications is not warranted. In many cases this would require replacing or recalibrating instruments, reanalysis of accuracy requirements and changing setpoints. This is not justified for some arbitrary upper or lower limit.

(B) Since SONGS 2/3 has complied with the post-TMI NUREG-0737 requirement to provide a post-accident sampling station (PASS), the need for a full on-site chemical analysis capability is not perceived as important, especially since off-site capability exists near-by.

(C) Some requirements can effectively be met by other measurements (for example, see Section III, on Safety Relief Valve Position on Main Steam Dump).

(D) SCE has consistently maintained that there is no requirement to measure containment sump water temperature. No justification exists for this measurement and alternatives do exist (see our response to FSAR question 022.33). Other areas where SCE considers exceptions to prescriptive RG 1.97 recommendations are warranted are the need for on-line coolant radioactivity measurements, and to the extensive radiation monitoring requirements and ranges where plant specific effluent analyses support reduced requirements.

(E) Since our RG 1.97 implementation program is dependent on other work presently scheduled for first refueling outages, and since specific scheduling and procurement is not yet fully defined, the RG 1.97 NRC recommended implementation date of June, 1983 is unrealistic. A target schedule for SONGS 2/3 is presented in Section IV.

Type "E" Variables

Type "E" - variables to be monitored in determining the magnitude of the release of radioactive materials.

RG 1.97 Type "E" variables were reviewed by SCE in the context of post TMI and current Technical Specification effluent monitoring requirements. It is concluded that SONGS 2/3 meets the intent of RG 1.97 and no changes are recommended to the existing and/or planned instrumentation at this time. The section of RG 1.97 that addresses "Environs Radiation and Radioactivity" will be implemented as part of the Emergency Plan and measurements will be taken and recorded using the Health Physics Computer.

In accordance with the objective of meeting RG 1.97 we purchased the Critical Functions Monitoring System (CFMS) and are purchasing the Qualified Safety Parameter Display System (QSPDS). The proposed implementation of RG 1.97 takes full advantage of the human factored display capabilities of these systems. By configuring the Catagory 1 inputs through the QSPDS (which is data-linked to the CFMS) separation criteria are maintained while meeting the NRC recommended availability criteria for the overall display system. In addition, the modem capability of these computers enables multiple displays using CRTs in the control room, Technical Support Center and Emergency Offsite Facilities.

In consideration of the amount and type of work required to install and/or upgrade instrument channels and the computer displays, we have a schedule of first refueling of both SONGS Units 2 and 3 for full implementation of the RG 1.97 equipment. However, because of existing capabilities, ongoing equipment qualification and overlapping committments for Unit 3 on inadequate core cooling instrumentation and QSPDS, we have established a phased approach for installing the necessary equipment. Thus, Unit 3 should, by fuel load, have a very good start on meeting RG 1.97 as proposed herein, whereas Unit 2 will have to wait until first refueling for the ICC system and QSPDS and during

cycle 1 will rely primarily on existing capability as presently stated in Tech. Spec. 3.3.3.6, Table 3.3-10. A description of the phased installation approach is provided in Section IV.

Based on SCE's position, as described herein, the number of changes to SONGS 2/3 to meet RG 1.97 are kept to a minimum while providing maximum operator usefulness. The display method fully utilizes the human factored capabilities of our existing CFM computer and the proposed schedule is a realistic estimate for implementation.

III. REGULATORY GUIDE 1.97
EXISTING INSTRUMENTATION AND UPGRADES

RG 1.97 UPGRADE RECOMMENDATIONS

ITEM	R.G. 1.97 RECOMMENDATION	SCE POSITION	SCE BASIS
Neutron Flux (Excore)	Post LOCA qualification	Replace existing detector/preamps with qualified instruments	o Instruments presently exist o This upgrade provides monitoring of post accident reactivity hence other upgrades may not be needed (e.g. Boron concentration).
RCS Pressure	Range to 4000 psig	Do not change from present 3000 psig	o Would have to add a new instrument to avoid recalibration of safety channels. o This pressure limit is based on ATWS analysis of CE plants which is presently being reviewed with the objective of reducing peak pressure
T_h, T_c	Range to 750°F	Do not change from present 710°F	o Temperatures associated with superheat are more meaningfull from CET's and RV level thermocouples. o Reduced sensitivity would impact instrument usefulness
RHR Flow	Post LOCA qualification; Range to 11K gpm; reliable power	Replace transmitter with a qualified one. Place instrument on UPS power.	o Present range of 10K gpm meets intent.

RG 1.97 UPGRADE RECOMMENDATIONS (cont'd)

ITEM	R.G. 1.97 RECOMMENDATION	SCE POSITION	SCE BASIS
SIT tank Pressure	Range to 750 psi; Post LOCA qualification; reliable power	Place instrument on UPS power.	o Present range of 700 psig meets intent. o Diverse ways exist to obtain core cooling information following LOCA, therefore, qualification upgrade is not warranted.
Pressurizer Backup Heater Status	New instrument to monitor current	Install ammeter	
Steam Generator Pressure	Range to 20% above safety valve setting	Do not change from present 1200 psig	o Basis for 20% above safety valve setting is arbitrary; Present instrument provides 10% above and extension would disrupt calibration of safety equipment.
Auxiliary FW Flow	Range to 110% of normal design flow	See Basis	o Current instrument does not meet range requirement but is effective for meeting operating procedures. o New instrument or justification for existing one will be incorporated with AFWS redesign planned for first refueling.
Containment Sump Water Temp.	New Instrument	Do Not Implement	o No defined need for this o Alternatives available to obtain this information
CCW Temp. to ESF system	Range to 200°F; post LOCA qualified; reliable power	Replace transmitter with a qualified one; Place instrument on UPS power	o Existing range of 150°F meets intent

RG 1.97 UPGRADE RECOMMENDATIONS (cont'd)

ITEM	R.G. 1.97 RECOMMENDATION	SCE POSITION	SCE BASIS
CCW Flow to ESF system	Post-LOCA qualified; reliable power	Replace transmitter with a qualified one; Place instrument on UPS power	
Safety Relief Valve Position on Main Steam Dump (or Main Steam Flow)	Post-LOCA qualification; reliable power	Existing Main Steam line flow instrument will be placed on UPS Replace trans-mitters and recorder with qualified ones.	o TMI modification includes steam line radiation monitors which, with flow, indicate release magnitude.
Boron Concentration	Range to 6000 ppm	Do not change from present 5000 ppm	o Meets intent o Can obtain Boron measurement from PASS system or grab sample.
Quench Tank Temp.	Range to 750°F	Do not change from present 300°F	o Present range unlikely to be exceeded because rupture disc will blow.
Main FW Flow	Range to 8.3 X 10^6 lbs (110% of design)	Do not change from present 8.0 x 10^6 lbs (105% of design)	o Meets intent
Radioactive Gas Holdup Tank Press.	Range to 450 psig	Do not change from present 400 psig	o Meets intent (safety valve on tank lifts at 350 psig)
SIT Tank Level	Range 10-90% volume; Post-LOCA qualification; reliable power	Place instrument on UPS power	o Existing range of 0 to 378 inches meets intent o See justification for SIT pressure

RG 1.97 UPGRADE RECOMMENDATIONS (cont'd)

ITEM	R.G. 1.97 RECOMMENDATION	SCE POSITION	SCE BASIS
Boric Acid Flow	Qualified to Post LOCA; reliable power	Replace transmitter with post-LOCA qualified one. Place instrument on UPS power.	
VCT Level	Qualified to Post LOCA; reliable power	Replace transmitter with post-LOCA qualified one. Place instrument on UPS power.	
Quench Tank Level	Range top to bottom	Do not change	o Any large relief from pressurizer safety valves would blow rupture disc o Present range of 0 to 48 inches meets intent.
Quench Tank Pressure	Range to design pressure	Do not change	o Any large relief would blow rupture disc o Any pressurizer safety valve leakage above design normal of 3 psig will be detected o Tank safety valve set at 130 psig o Present range of 25 psig meets intent
Area Radiation Monitoring Exposure rate in post accident access areas	Range to 10^4 R/hr	Do not change	o Currently installed area radiation monitors cover the range 10^{-1} to 10^4 mrem/hr. This latter range is adequate to determine if a specific area is accessible based on the analysis done for TMI NUREG 0737 item II.B.2. Area monitors can be augmented by local portable monitors.

RG 1.97 UPGRADE RECOMMENDATIONS (cont'd)

ITEM	R.G. 1.97 RECOMMENDATION	SCE POSITION	SCE BASIS
Radioactivity Concentration or Radiation Level in Circulating Primary Coolant	Provide instrument	Do not implement	o Process Radiation Monitor is available but not qualified (this instrument would be bypassed in the event of a LOCA). o This measurement can be obtained using the PASS. No continuous measurement is considered necessary.
CVCS Makeup Flow-in	Post-LOCA qualification; reliable power	Place instrument on UPS power; replace transmitter with qualified one.	o Already committed on this for safe cold shutdown.
CVCS Letdown Flow-out	Post-LOCA qualification; reliable power	Place instrument on UPS power	o Letdown flow is isolated and will not be used post-LOCA, so qualification not required.
Accident Sampling Capability (Analysis Capability On-Site) for Chloride Content of Primary Coolant	Provide on-site analysis capability for chloride	Do not implement	o Offsite analysis capability exists using PASS grab sampl o PASS can sample containment sump.

REG. GUIDE 1.97 UPGRADE RECOMMENDATIONS (cont'd)

TYPE "A" VARIABLES

The following are selected as type "A" variables:

Neutron Flux
RCS Hot Leg Temperaturre
RCS Cold Leg Temperature
RCS Pressure
Refueling Water Storage Tank Level
Containment Pressure
Containment Water Level
High Pressure Safety Injection Flow
Core Exit Thermocouples
Steam Generator Level
Steam Generator Pressure
Hydrogen Concentration
Reactor Vessel Level Monitoring System

All must be category 1 instrumentation. Upgrade is required for Neutron Flux only.

IV. REGULATORY GUIDE 1.97
IMPLEMENTATION SCHEDULE
SONGS 2/3

Much of the instrumentation proposed in this package to meet RG 1.97, Type A through D, is already installed in SONGS 2/3. The balance is being implemented in a phased approach.

The requirements of NUREG 0737 are being met by providing 322 inputs to the Critical Function Monitoring System (CFMS). These inputs include many RG 1.97 items. This implementation may be considered phase I of RG 1.97 and is a fuel load item for both SONGS 2 and 3.

Phase II is the implementation of the Inadequate Core Cooling System (ICCS). This includes upgrading the 56 Core Exit Thermocouples (CET's) to the post LOCA environment, installing of a Reactor Vessel Level Monitor System (RVLMS) and upgrading the Subcooled Margin Monitor to include up to 50°F superheat.

Phase II is a fuel load item for SONGS 3 and first refueling item for SONGS 2. Phase III contains no new instrumentation but involves wiring remaining safety related instrumentation to the CFMS [and Qualified Safety Parameter Display System (QSPDS)]. This phase is scheduled for first refueling on both SONGS 2 and 3. At this point a few differences still exist between SONGS 2/3 planned implementation and RG 1.97. These differences are listed in Section III.

The upgrade recommendations in Section III are labled Phase IV of the implementation package for the Accident Monitoring System (AMS). (The AMS is the combined CFMS and QSPDS microprocessors and associated equipment.) While this phase has not been formally scheduled, implementation is intended for first refueling of each unit.

Type E effluent variables are to be processed and displayed by the Health Physics Computer System. All instrumentation for Type E variables are fuel load items. Full operability of the Post-Accident Sampling System (PASS) for Unit 2 is scheduled for operation above 5% power.

Schedule Summary

The NRC suggested implementation date for RG 1.97 is June 1983. Not all RG 1.97 instrumentation will be installed on SONGS 2 and 3 by that date as shown in Figure 1. The list of items to be completed after June 1983 is as follows:

For Unit 2

Heated Junction Thermocouple System (RVLMS)
Section III list
Phases II and III items

For Unit 3

Section III list
Phase III items

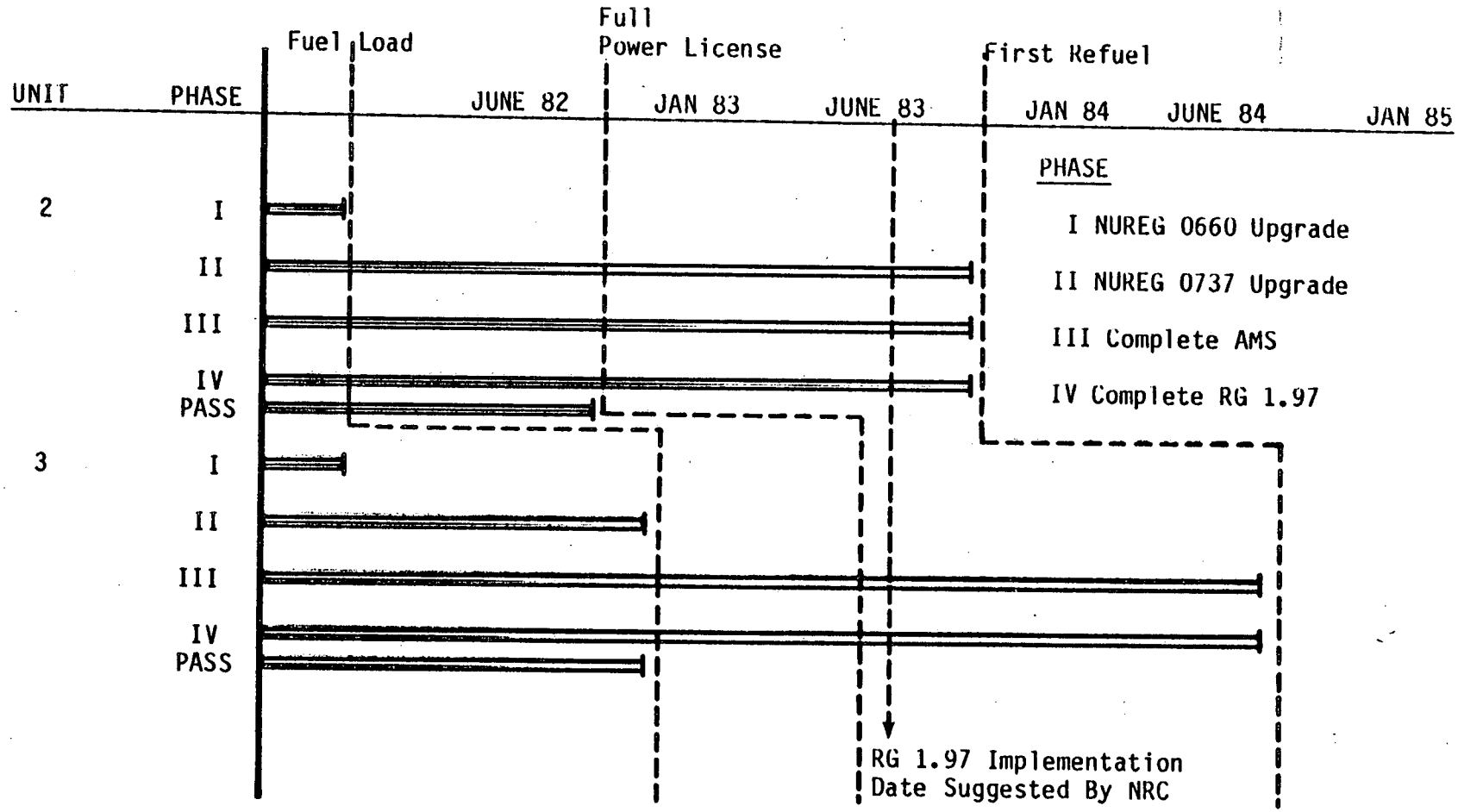

FIGURE 1 - RG 1.97 IMPLEMENTATION SCHEDULE FOR SONGS 2/3