SUPPLEMENTAL INFORMATION REPORT

OF

REGULATORY GUIDE 1.97 COMPLIANCE

AT

SAN ONOFRE UNIT 1

DOCKET NO. 50-206

MAY 1987

SOUTHERN CALIFORNIA EDISON COMPANY

ROSEMEAD, CALIFORNIA

I. INTRODUCTION

SCE letter dated December 16, 1985 (Reference 1) provided the NRC with information pertaining to the status of San Onofre Nuclear Generating Station, Unit 1 (SONGS-1) compliance with the Regulatory Guide 1.97 portion of Supplement 1 to NUREG-0737. NRC letter dated December 22, 1986 (Reference 2) provided SCE with a Technical Evaluation Report (TER) which evaluated our December 16, 1985 submittal and requested that additional information be provided to the NRC. Accordingly, it is the purpose of this report to respond to the request for information in Reference 2.

SCE considers that, in the event of an accident at SONGS-1, the variables listed in the December 16, 1985 submittal provide the operations personnel the information necessary to take appropriate safe shutdown actions and to monitor the progress of such a shutdown. The detailed basis for this determination was provided as part of the December 16, 1985 submittal. However, our recent review of the December 16, 1985 submittal indicated that, while the information provided may have been an adequate global description of SCE's basis, the information provided was not sufficient on a variable by variable basis to demonstrate that certain Reg. Guide 1.97 instrumentation should not be required for SONGS-1. Therefore, the information provided in this report responds to the Reference 2 request for additional information and also provides the detailed basis to demonstrate the appropriateness of the SONGS-1 specific list.

The SONGS-1 implementation of upgraded emergency operating instructions is provided in Section II. The Section II information is intended to provide a greater level of detail regarding the basis of the San Onofre Unit 1 post-accident instrumentation requirements. Section III responds to the NRC request for additional information in their December 22, 1986 letter. Section IV provides a list of references used throughout this report.

II. EOI UPGRADE PROGRAM

The information that follows describes the SONGS-1 Emergency Operating Instruction (EOI) upgrade program and justifies the use of the EOI's in the Regulatory Guide 1.97 review. (NOTE: Throughout this report the term "Reg. Guide 1.97" refers to Regulatory Guide, 1.97, Revision 2 (Reference 3), unless otherwise specified. The "SONGS-1 specific list" discussed in this report refers to the list enclosed with Reference 1.)

Upgrade of the emergency operating procedures at nuclear power plants is required by Supplement 1 to NUREG-0737. In compliance with these requirements, by SCE letter dated April 12, 1985 (Reference 4), the NRC was provided with the procedures generation package (PGP) for SONGS-1. The PGP describes how the EOIs (Reference 5) were prepared for SONGS-1 from the NRC and Westinghouse Owner's Group (WOG) guidance (Reference 6). It is the purpose of this discussion to describe the justification for the use of the SONGS-1 EOI's in determining the SONGS-1 specific list of post-accident monitoring instrumentation.

The NRC review of the WOG Emergency Response Guidelines (ERG's) is documented in Generic Letter 83-22 dated June 3, 1983 (Reference 7) and in a letter from T. M. Novak (NRC) to D. M. Butterfield (WOG) dated December 26, 1985 (Reference 8). These two documents constitute the NRC review of the BASIC version of the ERG's. Due to design differences from the Westinghouse reference plants, the SONGS-1 EOI set is based upon a combination of both the Low Pressure (LP) and High Pressure (HP) versions of the BASIC version of the ERG's, but primarily rely on the HP version. Since the SONGS-1 EOI's are based upon these NRC approved base documents, which constitute a thorough

job and function task analysis, the EOI's are the appropriate base documents to determine the optimum set of SONGS-1 instrumentation necessary to assess plant conditions during and following any accident that might occur at SONGS-1. Therefore, it is concluded that the EOI's are the appropriate basis for determining the set of SONGS-1 variables that should be available to control room personnel responsible for emergency response to accident scenarios.

In order to determine the scope of the SONGS-1 specific list a top-down approach to the function and task analysis was adopted. The scope of this analysis included the WOG ERGs, the SONGS-1 EOIs, the EOI Bases, and other existing plant documentation. The analysis reviewed the functions of the systems and the conditions under which they are used.

As a first step, operator tasks were identified from the WOG ERGs. Secondly, the operator tasks were broken down into plant-specific steps using the SONGS-1 EOIs. Thirdly, operator decisions and actions were identified and branching points in the EOIs, that required decision making by the operator, were identified. Finally, information and control requirements for successful task performance were developed and identified in the scope of the SONGS-1 specific list. However, as stated in the responses to the NRC questions in this document, the SONGS-1 specific list only includes those variables that are essential to perform preplanned manual operator actions, monitor critical safety functions and monitor offsite radiological releases. The information needed to assess the operating status of safety systems was not included in the SONGS-1 specific list, since variables

that are included on the list will provide the operator with enough information to ascertain the success of the safety system operation. Therefore, it is concluded that the scope of the SONGS-1 specific list is adequate to assure that the operator's post-accident informational needs are met.

III. DETAILED RESPONSES TO NRC QUESTIONS

The following items are taken from the NRC TER (Reference 2) and the number designations in parentheses correspond directly with those in the TER.

1. Items Lacking Licensee Commitment (3.3.1)

The consultant for the licensee identified areas where modifications are recommended. However, no commitment has been made by the licensee to complete these modifications. Appendix A* identifies these recommendations. The licensee should commit to making the changes and indicate when they will then meet Reg. Guide 1.97 criteria or provide justification for not completing the upgrades to meet Reg. Guide 1.97 criteria.

SCE Response:

As stated in SCE's letter dated April 23, 1985 (Reference 9), the Reg. Guide 1.97 upgrade plan will be included as part of the CRDR Summary Report due on August 14, 1987. Due to a need to integrate the results of the Reg. Guide 1.97 review with the remaining Supplement 1 to NUREG-0737 initiatives and to coordinate design related resources, SCE plans to defer the submittal of any upgrade information to the CRDR Summary Report.

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* Refers to Appendix A of Reference 2

2. Items Relying on the Fox 3 Computer for Compliance (3.3.2)

The licensee has identified variables that meet the regulatory guide recommendations if the Fox 3 computer is acceptable for recording and trend information. The licensee had identified each of these variables as Type A. Therefore, information about these variables are presumably essential for operator action relevant to safety. For "Display and Recording," Reg. Guide 1.97 states:

> "If direct and immediate trend or transient information is essential for operator information or action, the recording should be continuously available on redundant dedicated recorders."

The licensee should specifically state whether the Fox 3 computer meets the above criteria for each of the variables. If so, the licensee should describe how the criteria are met. If not, the licensee should state (for each variable) why the above criteria does not apply and why the variable is classified as a Type A variable if it is not essential for operator information.

A list of these variables and other information requested about the Fox 3 computer is identified in Appendix B.* The licensee should provide the additional information so that a judgment can be made on the acceptability of the Fox 3 computer for these deviations.

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* Refers to Appendix B of Reference 2

SCE Response:

See the SCE response to the NRC Appendix B information request at the end of Section III of this report for a complete description of the Fox 3 computer and its capabilities and for the response to the NRC TER Appendix B request for information.

3. Neutron Flux (3.3.3)

Reg. Guide 1.97 specifies environmentally qualified instrumentation for this variable. The instrumentation provided for this variable includes detectors that are not environmentally qualified.

The licensee states that following a design basis accident the reactor can be assumed to be subcritical which could be verified by the difference between the RCS hot leg and cold leg temperatures and by means of the control rod position lights. In the longer term, RCS grab sampling is adequate for confirming proper boron concentration to ensure that the reactor remains shutdown.

Environmental qualification has been clarified by the Environmental Qualification Rule, 10 CFR 50.49. We conclude that 10 CFR 50.49 has precedence over Reg. Guide 1.97. The licensee should show that this instrumentation has been addressed in accordance with 10 CFR 50.49.

SCE Response:

As stated in Reference 1, SONGS-1 has diverse indication (i.e., control rod position and the PASS) that can be used to verify reactor subcriticality. Therefore, SCE does not consider a specific upgrade to meet the Reg. Guide 1.97 neutron flux variable requirements to be necessary. However, SCE is currently planning to replace the Nuclear Instrumentation System (NIS), which monitors neutron flux. The replacement NIS will include redundant extended range intermediate range channels that meet the environmental qualification requirements of 10 CFR 50.49 and the Category 1 requirements for Reg. Guide 1.97. The NIS replacement is scheduled to be performed during the Cycle X refueling outage.

4. RCS Soluble Boron Concentrations (3.3.4)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

On-line verification of RCS soluble boron concentration is not required to verify shutdown margin at SONGS-1. Adequate shutdown margin at SONGS-1 is verified post-trip by control rod insertion status and, for events in which safety injection occurs, the routine surveillance of the refueling water storage tank (RWST) boric acid concentration performed prior to the event. Verification of shutdown margin in the long-term (e.g., prior to RHR entry) is currently available through the SONGS-1 Post-Accident Sampling System (PASS) instrumentation. RCS samples can be taken and analyzed using the PASS equipment.

The PASS has been reviewed and determined to be acceptable by the NRC (References 10, 11 and 12). Therefore, SCE does not consider an upgrade to be necessary to meet Reg. Guide 1.97 for RCS soluble boron concentrations.

5. RCS Cold Leg Water Temperature (3.3.5)

Reg. Guide 1.97, Revision 2, recommends instrumentation with a range of 50 to 750°F for this variable. Reg. Guide 1.97, Revision 3, changes the recommended range to 50 to 700°F. The licensee states that the existing recorder scale range is 100 to 600°F. This does not meet the recommendation of either regulatory guide revision. The licensee states that the primary function of this variable is to monitor the RCS cooldown rate based on downcomer coolant temperature and that the existing instrument/recorder range is adequate for this purpose.

We find this deviation unacceptable. The licensee should provide the recommended range or show that the provided instrumentation range, exceeds all expected design basis temperatures.

SCE Response:

The lower end of the 100 to 600°F range is acceptable since plant cooldown is considered to be completed prior to reaching 100°F, so use of the RCS cold leg water temperature instrumentation is not necessary below 100°F. Therefore, the lower end of the 100-600°F range is adequate to meet the SONGS-1 design basis.

The SONGS-1 design basis events were reviewed to determine the adequacy of the 600°F upper end of the RCS cold leg water temperature indication. It was determined both the loss of normal feedwater and the feedline break events exceed the 600°F. However, it is noted that the RCS cold leg water temperature indication is used primarily as an instrument to monitor the progress of post-accident RCS cooldown. At RCS temperatures in excess of 600°F the

plant is approaching an inadequate core cooling condition and it is not considered credible that the plant would be in an orderly RCS cooldown that would require the use of the RCS cold leg water temperature instrumentation to ensure that cooldown rate limits are not exceeded. At an RCS temperature in excess of 600°F the operator would be using core exit temperature (100-2200°F), subcooling margin monitor (0-150°F) and hot leg water temperature (100-700°F) instrumentation. Given the use of the cold leg water temperature instrumentation, it is expected that the RCS temperature would be well below 600°F before the cold leg instrumentation would be required. Therefore, it is concluded that no upgrade of the cold leg temperature instrumentation is required for SONGS-1.

6. RCS Hot Leg Water Temperature (3.3.6)

Reg. Guide 1.97, Revision 2, recommends instrumentation with a range of 50 to 750°F with recording capability for this variable. The licensee has provided a range of 100 to 700°F. The licensee states that the existing range meets the upper range limit of Reg. Guide 1.97, Revision 3 (700°F). Since Reg. Guide 1.97, Revision 3, lowered the upper range recommendation to 700°F, we find the existing upper range acceptable. The licensee further states that RCS temperature monitoring down to 50°F is not necessary since the emergency operating instructions specify actions based on whether or not the hot leg temperature has exceeded 680°F. Based on the licenses justification and the availability of an alternative, i.e., the residual heat removal temperature instrumentation that would be used for RCS coolant temperatures less than 100°F, we find the lower end of the range is adequate. The licensee states that the recording requirement is met by the Fox 3 computer. The acceptability of aspects other than range of this instrumentation is based on the additional information requested in Appendix B on the Fox 3 computer and certification by the licensee that the Reg. Guide 1.97 criteria are met.

SCE Response:

Based upon the information presented at the end of Section III of this report, and as accepted by the NRC in previous reviews (References 13 and 14), SCE considers the Fox 3 computer to be an acceptable means of meeting the intent of Reg. Guide 1.97 guidance for recording of RCS hot leg water temperature information.

7. RCS Pressure (3.3.7)

Reg. Guide 1.97 recommends instrumentation with a range of 0 to 3000 psig for this variable. In addition, the regulatory guide recommends complete separation between redundant channels. The licensee has instrumentation with an indicator range of 1600 to 2400 for this variable. The licensee states that the redundant recorder has a range of 0-3000 psig and the Fox 3 monitors RCS pressure and provides trend information for the 0 to 3000 psig range.

We find this range deviation unacceptable. Reg. Guide 1.97 states that it is essential that the range be sufficient to keep the instruments on scale. The licensee has not shown that this is the situation for all design basis accident scenarios. Therefore, we cannot concur with this deviations. The licensee should either show that the supplied range encompasses all anticipated RCS pressures or provide the recommended range.

The licensee states that the instrument loop and power supply cables for this instrumentation are routed in common cable trays and do not meet the physical separation criteria required.

The licensee should commit to modification of the cable routing for this instrumentation to comply with the redundancy recommendations of Reg. Guide 1.97.

SCE Response:

The RCS pressure indicators PI-430, 431 and 432 provide a 1600 to 2400 psig range and are the redundant inputs to PR-425 (0-3000 psig). The range of these instruments does

not include the 2485 psig setpoint of the pressurizer safety relief valves. However, since they are the redundant instrumentation in the CR to recorder PR-425 (0-3000 psig) and since PT-425X2 (0-3000 psig) on the Fox 3 computer in the Technical Support Center (TSC) has adequate range, no upgrade should be required. There is also diverse CR indication in the form of the subcooling margin monitors (SMM) which have Reg. Guide 1.97, Category 1, 0-3000 psig inputs (PT-425X1 and PT-425X2), separate from the RCS pressure indication, from which RCS pressure can be derived using RCS temperature indication. Also, since the PORV(s) setpoint is 2190 psig, it is not expected that the RCS pressure will exceed the 2400 psig upper limit of PI-430, 431 and 432.

Regarding the Reg. Guide 1.97 lower limit of 0 psig versus the 1600 psig lower limit of PI-430, 431 and 432, at pressures lower than 1600 psig, operators concerns center around the operation and success of safety systems, and not failure of the RCS pressure boundary. For the determination of successful safety system operation, there is a large amount of diverse indications in the form of safety injection (SI) and charging flow indication, SI and charging system valve status, RWST level indications and RCS pressure recorder PR-425. Additionally, the personnel in the TSC will be monitoring the progress of any event and will be available to alert the control room personnel of any RCS pressure transients that they observe on the Fox-3. At an RCS pressure of approximately 350 psig the operators place the residual heat removal (RHR) system in service to complete plant cooldown. Therefore, considering the availability of redundant and diverse instrumentation PR-425, PT-425X2 (on the Fox 3) and PT-425X1 (on the SMM), SCE does not consider the upgrade

of PI-430, 431 and 432, in order to meet Reg. Guide 1.97 guidance concerning instrument range, to be necessary for SONGS-1. In addition, any increase in the range of these channels would adversely impact their accuracy for reactor protection safety injection actuation functions.

As previously stated in SCE's December 16, 1985 submittal, the instrument loop cables for the RCS pressure indicators are routed in common raceways. These raceways contain only low voltage instrument circuits and do not have sufficient energy to cause common mode failures and are adequately separated from all other raceways. Common mode failures due to high energy line break interactions will be evaluated as part of the high energy line break analysis. The power supply circuits to the instrument loops are routed in common cable trays and are subject to common mode failures. Upgrade of the power supply circuits to provide adequate separation was recommended by Reference 1, and as previously stated in our response to TER Item 3.3.1, any upgrades will be included in the final Reg. Guide 1.97 upgrade plan as part of the CRDR Summary Report.

8. Core Exit Temperature (3.3.8)

Reg. Guide 1.97 recommends that environmentally qualified instrumentation be provided for this variable. The licensee has provided instrumentation with thermocouples that are not verified as environmentally qualified.

The NRC is reviewing the acceptability of this variable as part of their review of NUREG-0737, Item II.F.2.

SCE Response:

In a letter dated June 20, 1986 (Reference 15), SCE's response to NUREG-0737, Item II.F.2 indicated that the SONGS-1 core-exit thermocouples (CETs) will be environmentally qualified. The upgraded CETs will meet the remainder of the Reg. Guide 1.97, Category 1 guidance.

9. Recirculation Flow (Safety Injection) (3.3.9)

The licensee has designated this flow as a Type A variable, which requires recording capability. The licensee states that trending of recirculation flow rate is not required to assure appropriate operator response.

We find this justification unacceptable for a Type A variable. Reg. Guide 1.97 does not require this instrumentation to be Type A. The licensee has determined that this instrumentation is Type A. The licensee should provide recording capability for this variable.

SCE Response:

The SONGS-1 recirculation system is a separate system from the safety injection system and is placed in operation when the post-accident safety injection phase is completed. Therefore, recirculation flow is critical to successful operator action to correctly initiate this system. Additionally, the operator has subsequent action at 1 hour and 19 hours to reduce flow and transfer to hot leg recirculation, respectively. Accordingly, recirculation flow is a Type I (SONGS-1 specific list) variable.

Trending of recirculation flow is provided by use of the Fox 3 computer in the TSC. For the reasons stated in SCE's response to TER Item 3.3.2, SCE considers this to be an acceptable means of recording recirculation flow. Therefore, SCE does not consider an upgrade of this instrumentation to be necessary to meet Reg. Guide 1.97.

10. Coolant Level in Reactor (3.3.10)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

SCE has provided to the NRC by Reference 15, a justification for not installing a reactor vessel level indication system at SONGS-1. It is anticipated that resolution of the post-TMI II.F.2 issue will resolve this Reg. Guide 1.97 variable for SONGS-1 and no additional information is required at this time.

11. Degrees of Subcooling (3.3.11)

Reg. Guide 1.97 recommends a range of 200°F subcooling to 35°F superheat for this variable. The licensee has provided instrumentation with a range of 150°F subcooling to 50°F superheat. The licensee has not provided recording capability for this variable which has been designated as a Type A variable by the licensee.

The NRC is reviewing the acceptability of this variable as part of their review of NUREG-0737, Item II.F.2.

SCE Response:

The NRC review of NUREG-0737, Item II.F.2 will resolve the range discrepancy. Recording capability for the Subcooling Margin Monitor is provided by the Fox 3 computer in the TSC. For the reasons stated in SCE's response to TER Item 3.3.2, SCE considers this to be an acceptable means of recording degrees of subcooling.

12. Containment Sump (Containment Sphere) Water Level (3.3.12)

Reg. Guide 1.97 recommends that the instrumentation for the wide range containment sump level be Category 1, which requires recording capability. The licensee has not provided recording capability and states that the sphere level trend information may be obtained from the Fox 3 computer.

The acceptability of this instrumentation is based on the additional information requested in Appendix B and the licensee's certification that Reg. Guide 1.97 criteria are met.

SCE Response:

Based upon the information presented at the end of Section III of this report, and as accepted by the NRC in previous reviews (References 13 and 14), SCE considers the Fox 3 computer to be an acceptable means of meeting the intent of Reg. Guide 1.97 guidance for recording of containment sphere water level information.

13. Containment Pressure (3.3.13)

Reg. Guide 1.97 recommends Category 1 instrumentation for this variable. Thus, recording capability is recommended. The licensee states that wide range containment pressure trend information may be obtained from the Fox 3 computer.

The acceptability of this instrumentation is based on the additional information requested in Appendix B and the licensee's certification that Reg. Guide 1.97 criteria are met.

SCE Response:

Based upon the information presented at the end of Section III of this report, and as accepted by the NRC in previous reviews (References 13 and 14), SCE considers the Fox 3 computer to be an acceptable means of meeting the intent of Reg. Guide 1.97 guidance for recording of containment pressure information.

14. Radioactivity Concentration or Radiation Level in Circulating Primary Coolant (3.3.14)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

RCS activity is not used as a basis for any decision relating to post-accident operations, except whether to restore letdown and whether or not activity levels will preclude maintenance on safety equipment in penetration buildings. For letdown restoration and sphere and penetration area access, immediate activity information is not required, and activity information can be adequately provided via the containment area radiation monitors and the PASS. The measurement of radioactivity concentration in the primary coolant is thus redundant to other variables (i.e., containment radiation) on the SONGS-1 specific list for the detection of fuel cladding breach and redundant to other available instrumentation (i.e., the PASS). Therefore, on-line RCS radioactivity concentration monitoring was not included on the SONGS-1 list. The SONGS-1 containment area radiation monitors are Category 1 instruments with a range of 1 to 10^8 R/hr. As described in SCE's letter dated August 14, 1984 (Reference 16), these instruments can be used to predict fuel failure.

Based upon the above discussed information, RCS activity is measured by existing instrumentation in a manner adequate for valid post-accident monitoring requirements and SCE does not consider any additional upgrade to be required to meet Reg. Guide 1.97.

15. Analysis of Primary Coolant (3.3.15)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The gamma spectrum analysis of the primary coolant is considered to be redundant to other fuel cladding breach detection variables on the SONGS-1 specific list (i.e., the containment area radiation monitors and the PASS). When the diversity of and need for this indication (see SCE response to TER Item 3.3.14) is considered, the gamma spectrum analysis variable was not included on the SONGS-1 specific list. For a description of the SONGS-1 PASS capability, see the SCE response to TER Item 3.3.4.

16. Containment Hydrogen Concentration (3.3.16)

Reg. Guide 1.97 recommends Category 1 instrumentation for this variable. Thus, recording capability is recommended. The licensee has not provided recording capability and states that the containment hydrogen trend information may be obtained from the Fox 3 computer.

The acceptability of this instrumentation is based on the additional information requested in Appendix B and the licensee's certification that Reg. Guide 1.97 criteria are met.

SCE Response:

Based upon the information presented at the end of Section III of this report, and as accepted by the NRC in previous reviews (References 13 and 14), SCE considers the Fox 3 computer to be an acceptable means of meeting the intent of Reg. Guide 1.97 guidance for recording of containment hydrogen concentration information.

17. Residual Heat Removal (RHR) System Flow (3.3.17)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this variable is required for cold shutdown, but is not required in response to accident conditions.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

SONGS-1 uses a recirculation system, separate from the RHR system, for post-LOCA cooldown; therefore, the measurement of RHR system parameters is not as important for SONGS-1, since RHR is only required to cool the plant to cold shutdown. While it may be desirable to proceed from hot shutdown to cold shutdown, the RHR system is not necessary to assure safe (i.e., hot) shutdown at SONGS-1. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may or may not meet the design criteria of Reg. Guide 1.97. However, based upon the SONGS-1 Reg. Guide 1.97 review,

upgrade of this additional instrumentation is not required. Accordingly, the following information on the SONGS-1 RHR flow indication is provided for your information only.

SONGS-1 has RHR flow provided by FT-602. FT-602 has a range of 0-3000 gpm, corresponding to a maximum design flow rate of 2340 gpm. This instrumentation meets Reg. Guide 1.97, Category 2 guidance.

18. RHR Heat Exchanger Outlet Temperature (3.3.18)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this variable is required for cold shutdown, but is not required in response to accident conditions.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

SONGS-1 uses a recirculation system, separate from the RHR system, for post-LOCA cooldown; therefore, the measurement of RHR system parameters is not as important for SONGS-1, since RHR is only required to cool the plant to Cold Shutdown. Therefore, while it may be desirable to proceed from hot shutdown to cold shutdown, the RHR system is not necessary to assure safe (i.e., hot) shutdown at SONGS-1. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97

review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the SONGS-1 RHR temperature indication is provided for your information only.

SONGS-1 has RHR temperature provided by TE-601A and B. TE-6001A and B each have a range of 100-400°F. This instrumentation meets Reg. Guide 1.97, Category 2 guidance, with the exception of environmental qualification.

19. Flow in Low Pressure Injection (LPI) Systems (3.3.19)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this variable is not required for verifying system operation (i.e., valve alignment, pump operation).

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The measurement of safety injection (SI) flow was not included on the SONGS-1 specific list, since measurement of this variable is not required to verify proper SI system operation. The RWST level and the SI system pump and valve status instrumentation all can be used to verify proper SI system operation. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97

review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the safety injection flow indication is provided for your information only.

SONGS-1 has safety injection flow indicated by FT-912, 913 and 914 after the flow is separated into the three cold leg injection lines. Each SI line has indication with a range of 0-6000 gpm, corresponding to a design flow rate of 5200 gpm for the design basis condition of one SI line blocked, one SI line spilling, one SI line injecting and one SI train operating. This instrumentation meets Reg. Guide 1.97, Category 2 guidance.

20. Refueling Water Storage Tank Level (3.3.20)

Reg. Guide 1.97 recommends Category 2 instrumentation for this variable. However, the licensee has designated this tank level as a Type A variable that required redundant instrumentation and recording capability. The licensee states that one of the redundant instrument loops provides indication and the other an alarm and input to the Fox 3 computer.

We find this deviation unacceptable for a Type A variable. Reg. Guide 1.97 does not require this instrumentation to be Type A. The licensee has determined that this instrumentation is Type A. The licensee should provide redundant continuous indication of the tank level. The recording requirement should be met for this instrumentation.

SCE Response:

SONGS-1 has two level instruments on the Refueling Water Storage Tank (RWST). LT-950 displays level 0% to 100%, and LS-69 functions to alarm at 21% RWST level, in order to alert the operators to begin the switch over from SI to recirculation. The control room display for LT-950 is continuous, with no recording.

Given that the intent of this instrumentation is to alert the operators of the need to take action, the RWST level instrumentation described above provides the necessary information for the operators to take their preplanned manual action for ESF switchover from SI to recirculation. The setpoint of LS-69 is designed to allow enough time for the operator to complete the necessary switchover

operations prior to SI pump cavitation. Additional information from a separate level indicator (LT 3020) is also available on the Fox 3, in the adjacent TSC and for the reasons indicated in SCE's response to TER Item 3.3.6, the Fox 3 is an acceptable means for recording and trending RWST level.

In response to the results of the NRC Systematic Evaluation Program (SEP) review of the manual switchover of the SI from the RWST to the containment sump, SCE plans to install automatic pump trip capability, such that the SI system shuts down when a certain RWST level is achieved. This automatic feature will significantly lessen the importance of the time factor for operator action to perform the ESF switchover. The SONGS-1 Integrated Living Schedule currently schedules this modification for completion during the Cycle XI refueling outage. Therefore, when this modification is completed, the RWST level indication will be a Category 2 variable and the unresolved Category 1 issues described above will not be applicable. Therefore, SCE does not consider an upgrade of the RWST level instrumentation to be necessary to meet Reg. Guide 1.97.

21. Reactor Coolant Pump Status (3.3.21)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this is not a critical safety function.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The status of the reactor coolant pump (RCP) is not considered to be a critical safety function at SONGS-1. The analyses submitted in response to the post-TMI RCP trip issue (Reference 18) concluded that RCP operation status does not affect shutdown capability. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97

review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the RCP status indication is provided for your information only.

SONGS-1 has reactor coolant pump status provided by ammeters II-1002A, B and C and RCS flow indicators FI-400, 410 and 420. This instrumentation meets the Reg. Guide 1.97, Category 3 guidance.

22. Primary System Safety Relief Valve Position (3.3.22)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this is not required in response to accident conditions.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The verification of primary system safety valve and PORV valve position is not required in response to accident conditions. The operator response in the EOIs is not dependent on safety or relief valve status. Flow through the safety valves cannot be isolated, and cannot be terminated except by decreasing the RCS pressure below the valve closure setpoint. If flow is through the PORVs and the operator cannot verify PORV closure, the PORV Block Valves are closed. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may or may not meet the design criteria of Reg. Guide 1.97

list. However, based upon the SONGS-1 Reg. Guide 1.97 review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the primary system safety and relief valve position indication is provided for your information only.

SONGS-1 has valve position indication on the pressurizer PORVs (CV-545 and 546), the PORV Block Valves (CV-530 and 531) and on the Safety Valves (RV-532 and 533). This instrumentation meets the Reg. Guide 1.97, Category 2 guidance.

23. Pressurizer Heater Status (3.3.23)

Reg. Guide 1.97 recommends the measurement of the heater current to verify heater operation and to prevent overloading the heater power sources. The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this is not required in response to accident conditions.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The indication of pressurizer heater status is not necessary to verify the accomplishment of a critical safety function or to take a preplanned manual operator action, as required by the EOIs. The operator response to plant conditions is independent of the pressurizer heater status. Therefore, it is concluded that indication of pressurizer heater status, while it may be helpful in certain situations, is not necessary to respond to accident conditions and that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may

or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97 review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the pressurizer heater status is provided for your information only.

SONGS-1 has pressurizer heater status provided by ammeters II-1789A and B. The indication in the control room is in the form of kW of heater output. Additionally, the pressurizer heater breaker position is also provided in the control room. This instrumentation meets the Reg. Guide 1.97, Category 2 guidance.

24. Quench Tank Level (3.3.24)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this is not required in response to accident conditions.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The measurement of the pressurizer relief tank level was not included on the SONGS-1 specific list because it is not required to assure proper operator response to accident conditions. It is only used as one parameter to evaluate, as a last look, the cause of the abnormal plant conditions that initiated a plant trip or safety injection. However, in the absence of this plant indication, the operator would still be instructed to repeat the steps of this particular EOI in order to evaluate the plant conditions. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation,

outside the scope of the SONGS-1 specific list, that may or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97 review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the pressurizer relief tank level indication is provided for your information only.

SONGS-1 has pressurizer relief tank level indication provided by LT-440, with a range of 0-100% of tap span. This indicated range corresponds to a range of 6 to 94% of actual tank volume. This instrumentation meets Reg. Guide 1.97, Category 3 guidance.

25. Quench Tank Temperature (3.3.25)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this is not required in response to accident conditions.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The measurement of the pressurizer relief tank temperature was not included on the SONGS-1 specific list because it is not required to assure proper operator response to accident conditions. It is only used as one parameter to evaluate, as a last look, the cause of the abnormal plant conditions that initiated a plant trip or safety injection. However, in the absence of this plant indication, the operator would still be instructed to repeat the steps of this particular EOI in order to evaluate the plant conditions. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may

or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97 review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the pressurizer relief tank temperature indication is provided for your information only.

SONGS-1 has pressurizer relief tank temperature indication provided by TI-440, with a range of 100°F to 250°F. This instrumentation meets Reg. Guide 1.97, Category 3 guidance, with the exception of range.

26. Quench Tank Pressure (3.3.26)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this is not required in response to accident conditions.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The measurement of the pressurizer relief tank pressure was not included on the SONGS-1 specific list because it is not required to assure proper operator response to accident conditions. It is only used as one parameter to evaluate, as a last look, the cause of the abnormal plant conditions that initiated a plant trip or safety injection. However, in the absence of this plant indication, the operator would still be instructed to repeat the steps of this particular EOI in order to evaluate the plant conditions. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may

or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97 review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the pressurizer relief tank indication is provided for your information only.

SONGS-1 has pressurizer relief tank pressure indication provided by PT-441, with a range of 0-50 psig. The design pressure of the tank is 100 psig and the tank has a rupture disc that limits the maximum pressure to 100 psig. This instrumentation meets Reg. Guide 1.97, Category 3 guidance, with the exception of range.

27. Steam Generator Level (Wide Range) (3.3.27)

Reg. Guide 1.97 recommends Category 1 instrumentation for this variable that monitors steam generator level from the tube sheet to the separators. The licensee has identified acceptable narrow range instrumentation, but, states that the wide range instrumentation is not environmentally qualified and the range is not provided.

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737 for the wide range steam generator level.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Responses:

As previously stated, the wide range steam generator level instrumentation is used as a redundant AFW flow indication. SONGS-1 wide range steam generator level indication is provided by LT-450, 451 and 452 for steam generators A, B, and C, respectively. The indication is from approximately 3 inches above the tube sheet to approximately the steam separation equipment. The output is 0-318" of level (Note: For reference the feed ring is at 256"). As indicated in SCE's December 16, 1985 submittal, this instrumentation provides the redundant auxiliary feedwater (AFW) flow indication. The operators are trained in the use of the wide range level indication for AFW flow when the EOIs are in use. As previously stated in SCE's December 16, 1985 submittal the wide range

steam generator level instrumentation meets the Reg. Guide, Category 1 guidance, with the exception of qualification, which was recommended for upgrade. It is noted that this instrumentation is currently planned for replacement as part of the instrument rack upgrade work that SCE is planning for completion during the Cycle XI outage. The replacement instruments will be environmentally qualified and will, therefore, meet Reg. Guide 1.97 with the exception of separation. It is still recommended that the steam generator wide range level instruments be upgraded to meet separation criteria.

28. Safety/Relief Valve Positions or Main Steam Flow (3.3.28)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this is not required in response to accident conditions.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The measurement of main steam flow or safety/relief valve position is not required to verify the accomplishment of post-accident safety functions. The primary and/or secondary system response to operator action is sufficient to tell the operator that the action of secondary system relief has been accomplished. Due to the location of the east steam line relief valve header directly adjacent to the north control room wall, the operators would detect secondary steam relief by observation of the considerable noise associated with steam relief. Additionally, since SONGS-1 does not have main steam isolation except for a low priority manual (i.e., local manual operation of the main steam block valves), the measurement of the variable is less important for SONGS-1 than for other PWRs. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will

assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97 review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the main steam flow indication is provided for your information only.

SONGS-1 has main steam flow indication provided by FI-460, 461 and 462, with a range of $0-2.5 \times 10^6$ lb/hr per steam generator. This instrumentation meets the Reg. Guide 1.97, Category 2 guidance.

29. Main Feedwater Flow (3.3.29)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this is not required in response to accident conditions.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The main feed water (MFW) pumps at SONGS-1 also function as the final booster for the safety injection system. Therefore, any accident requiring SI will have realigned these pumps to this configuration. The use of the MFW pumps as a potential backup is limited to those events where they are available for this "secondary" priority use. Therefore, the monitoring of the MFW flow variable is not important for SONGS-1, as it is for other PWRs. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97

review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the main feedwater flow indication is provided for your information only.

SONGS-1 has main feed water flow indication provided by the steam generator recorders YR-456A, 457A and 458A. The indicated range is $0-2.5 \times 10^6$ lb/hr, versus a design flow rate of approximately 1.9×10^6 lb/hr. This instrumentation meets the Reg. Guide 1.97, Category 3 guidance.

30. Auxiliary Feedwater Flow (3.3.30)

The licensee has designated this flow instrumentation as a Type A variable, which requires Category 1 instrumentation with qualified redundant channels and recording capability. The licensee states that steam generator wide range level (which will be qualified) is used as the redundant flow instrument and the Fox 3 will provide the flow trend information.

We find that the upgraded wide range steam generator level instrumentation is adequate to meet the redundancy requirement; however, the licensee should confirm that the emergency operating procedures provide for this alternate measurement. The recording requirement is based on the additional information requested in Appendix B and the licensee's certification that Reg. Guide 1.97 criteria are met.

SCE Response:

The SONGS-1 operating personnel are trained in the use of the wide range steam generator level as an alternate or redundant indication to the AFW flow indication. Additionally, its use is called for in the EOIs regarding reestablishment of AFW flow or MFW flow. For SCE's response to the TER Appendix B information request, see the SCE response to TER Item 3.3.2.

31. Condensate Storage Tank (Auxiliary Feedwater Tank) Level (3.3.31)

Reg. Guide 1.97 recommends the instrumentation for this variable to be Category 1, which requires recording capability. The licensee states that adequate auxiliary feedwater tank level trend information may be obtained from the Fox 3.

The acceptability of this instrumentation is based on the additional information requested in Appendix B and the licensee's certification that Reg. Guide 1.97 criteria are met.

SCE Response:

Based upon the information presented at the end of Section III of this report, and as accepted by the NRC in previous reviews (References 13 and 14), it is SCE considers the Fox 3 computer to be an acceptable means of meeting the intent of Reg. Guide 1.97 guidance for recording of auxiliary feedwater tank level information.

32. Containment Spray Flow (3.3.32)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this instrumentation is not required for verifying system operation.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The measurement of containment spray flow is not necessary to verify system operation. The verification of system valve alignment and operation of the pumps is sufficient. These alternate means are called for in the EOIs and they are qualified. In addition, the qualified indication of containment pressure provides a direct measure of spray system effectiveness in containment energy removal. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97

review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the containment spray flow indication is provided for your information only.

SONGS-1 has containment spray flow provided by FT-504. FT-504 has a range of 0-1500 gpm, corresponding to a design basis flow of 1080 gpm. In any event, the maximum design capacity of this system is 1500 gpm, which would not exceed the 0-1500 gpm flow measurement capability. This instrumentation meets Reg. Guide 1.97, Category 2 guidance, with the exception of environmental qualification.

33. Containment Atmosphere Temperature (3.3.33)

Reg. Guide 1.97 recommends Category 2 instrumentation with a range of 40 to 400°F to monitor this variable. The licensee states that this instrumentation does not exist and is not required in response to accident conditions.

This justification is not acceptable. The licensee should either provide the recommended instrumentation or show an alternate means of determining this temperature.

SCE Response:

The measurement of containment temperature is a diverse/alternate to the containment pressure indication which is on the SONGS-1 list. The accomplishment of containment cooling can be verified by the interpretation of containment pressure data. Also, since containment integrity is the concern, containment pressure is a more meaningful parameter. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

34. Containment Sump Water Temperature (3.3.34)

Reg. Guide 1.97 recommends Category 2 instrumentation with a range of 50 to 250°F to monitor this variable. The licensee states that this instrumentation does not exist and is not required in response to accident conditions.

This justification is not acceptable. The licensee should provide recommended instrumentation for the functions outlined in Reg. Guide 1.97 or identify other instruments that provide the same information (such as the RHR heat exchanger inlet temperature) and satisfy the Category 2 requirements of the regulatory guide that will allow a quantitative look at the operation of the heat removal from the containment sump.

SCE Response:

Reg. Guide 1.97 recommends inclusion of an instrument for containment sump water temperature "to monitor operation" of the containment cooling systems. Operation of the containment cooling systems, which at SONGS-1 consist only of the containment spray and recirculation system, are monitored most directly by the qualified, safety-grade containment pressure indication or by system status (i.e, flow, valve position and pump status) of the containment spray and recirculation system. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

35. Makeup Flow-In (3.3.35)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this is not required in response to accident conditions.

NUREG-1190, Section 4.9, states that the chemical and volume control system is a safety related auxiliary system with post-accident functions. Therefore, the licensee should provide Category 2 instrumentation with the recommended range for this variable.

SCE Response:

For post-accident operation at SONGS-1, the charging system functions first in an injection mode through the normal charging flow path, and later participates in the recirculation mode of operation discussed in SCE's response to TER Item 3.3.9. Injection flow through the normal charging path is measured by FI-1112. However, due to lack of charging system design for single active failures, no flow from this source is credited in the SONGS-1 safety analyses and there are no related operator actions in the EOIs. Since the charging pumps are train aligned during recirculation, any flow measurement requirements for the recirculation mode of operation is covered by the instrumentation discussed in SCE's response to TER Item 3.3.9. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

36. Letdown Flow-Out (3.3.36)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this is not required in response to accident conditions.

NUREG-1190, Section 4.9, states that the chemical and volume control system is a safety related auxiliary system with post-accident functions. Therefore, the licensee should provide Category 2 instrumentation with the recommended range for this variable.

SCE Response:

For reasons of shielding and post-accident access, in the event of an accident, the primary system letdown is isolated at SONGS-1 and, consequently, measurement of this variable is not required for SONGS-1 post-accident operations. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

37. Volume Control Tank Level (3.3.37)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this is not required in response to accident conditions.

NUREG-1190, Section 4.9, states that the chemical and volume control system is a safety related auxiliary system with post-accident functions. Therefore, the licensee should provide Category 2 instrumentation with the recommended range for this variable.

SCE Response:

Operation of the volume control tank (VCT) is not required for SONGS-1 post-accident operation. It is isolated either remote-manually or automatically during the realignment of the charging pump suction to the safe shutdown path. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97

review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the VCT level indication is provided for your information only.

SONGS-1 has VCT level indication provided by LT-1100 which has a range of 0-100% of the VCT. This instrumentation is safety related because of non-accident control functions for the safety related charging pump suction alignment valves. However, the level indication and associated non-accident suction alignment functions are neither credited post-accident nor will its failure affect any safety function.

38. Component Cooling Water (CCW) Temperature to Engineered Safety Features (ESF) System (3.3.38)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this is not required in response to accident conditions.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The measurement of component cooling water temperature is not necessary to verify the accomplishment of its safety function. The response of the plant to operator actions is sufficient to indicate appropriate CCW temperature. Additionally, pump operation and valve position status is available to verify system operation. Since the SONGS-1 ultimate heat sink has minimal daily or seasonal deviation from the nominal temperature of 62°F, the CCW temperature control function required for other plants is not required for SONGS-1, since the valves and pumps operate "full out." Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation,

outside the scope of the SONGS-1 specific list, that may or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97 review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the CCW temperature indication is provided for your information only.

SONGS-1 has CCW temperature provided by TI-606A and B. TI-606A and B each have a range of 50-200°F. This instrumentation meets Reg. Guide 1.97, Category 2 guidance, with the exception of environmental qualification.

39. CCW Flow to ESF System (3.3.39)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this is not required in response to accident conditions.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The measurement of component cooling water flow is not necessary to verify the accomplishment of its safety function. The response of the plant to operator actions is sufficient to indicate appropriate CCW flow. Additionally, pump operation and valve position status is available to verify system operation. Since the SONGS-1 ultimate heat sink has minimal daily or seasonal deviation from the nominal temperature of 62°F, the CCW temperature control function required for other plants is not required for SONGS-1, since the valves and pumps operate "full out." Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may

or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97 review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the CCW flow indication is provided for your information only.

SONGS-1 has CCW flow provided by FT-606. FT-606 has a range of 0-7000 gpm corresponding to a maximum design flow rate of 5640 gpm. This instrumentation meets Reg. Guide 1.97, Category 2 guidance, with the exception of environmental qualification.

40. High-Level Radioactive Liquid Tank Level (3.3.40)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The monitoring of effluent release pathways is sufficient to properly assess offsite conditions. Additionally, for shielding and post-accident personnel access reasons, flow to this system is isolated during post-accident response. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97 review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the radioactive liquid tank level indication is provided for your information only.

SONGS-1 has high level local alarms on the decontamination drain tank, the two monitor tanks, and the three holdup tanks, provided by LS-44, 70, 71, 72, 78 and 79. These alarms all indicate high level approximately 1 1/2 - 2 feet prior to overflow or to reaching the maximum capacity of these tanks. This instrumentation meets the Reg. Guide 1.97, Category 3 guidance.

41. Radioactive Gas Holdup Tank Pressure (3.3.41)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this is not required in response to accident conditions.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The monitoring of effluent release pathways is sufficient to properly assess offsite conditions. Additionally, for shielding and post-accident personnel access reasons, flow to this system is isolated during post-accident response. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97 review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the radioactive gas holdup tank pressure indication is provided for your information only.

SONGS-1 has high waste gas decay tank pressure provided locally, with an alarm on a slave panel located in the control room, by PS-11, 12 and 13 for the three tanks. This alarms at 100 psig, such that the 150 psig design pressure is not exceeded. This instrumentation meets the Reg. Guide 1.97, Category 3 guidance.

42. Emergency Ventilation Damper Position (3.3.42)

Reg. Guide 1.97 recommends Category 2 instrumentation to monitor the damper status. The licensee states that this indication has not been provided.

This is not acceptable. The licensee should either install the recommended instrumentation or show the existence of an alternate means of determining the emergency ventilation damper position.

SCE Response:

SONGS-1 does not have emergency ventilation damper position indication. SCE's proposed resolution of the design issues associated with the control room HVAC system as delineated in SCE's submittal dated October 10, 1986 (Reference 19) are currently under review by the NRC.

43. Status of Standby Power and Other Energy Sources (3.3.43)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this is not required in response to accident conditions.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The response obtained by the operation of systems that are powered by electrical or instrument air sources is sufficient to determine the status of the power systems. Therefore, direct monitoring of power supply status or air system is not required to assure proper SONGS-1 post-accident response. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97

review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the status of standby power and other energy sources indication is provided for your information only.

SONGS-1 has the following:

	System	Status
1.	120V-AC (Vital Buses)	Energized/Not Energized
2.	125V-DC	0-150V and 0-800A
3.	4 kV	Energized/Not Energized, Voltage, Load (kW)
4.	480V	Energized/Not Energized, Voltage, Load (kW)
5.	220 kV	Energized/Not Energized, Frequency, Voltage
6.	Diesel Generator	Frequency (SI-103 for DG #1) (SI-113 for DG #2)

The instrument air system is not safety related and is not credited post-accident. All devices which require air pressure to perform their post-accident functions are provided with safety-related backup pneumatic supplies (i.e., stored nitrogen). Each backup system has local pressure gauges for surveillance purposes. Therefore, control room indication of the instrument air system status is not appropriate for SONGS-1.

The above described power system status indication meets Reg. Guide 1.97, Category 2 guidance.

44. Radiation Exposure Rate (Inside Buildings--) (3.3.44)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this is not required in response to accident conditions.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

The monitoring of areas inside of buildings at SONGS-1 is limited, since there are very few enclosed buildings and most of this type of monitoring is handled by manually performed surveys. Therefore, it is concluded that this variable should not be included on the SONGS-1 specific list.

As stated in the first two sections of this document, the scope of the SONGS-1 specific list provides the SONGS-1 operators with sufficient information to assess and respond to all of the design basis accidents. SCE will assure that the instrumentation on the SONGS-1 specific list meets the design criteria of Reg. Guide 1.97. It is recognized that SONGS-1 has additional instrumentation, outside the scope of the SONGS-1 specific list, that may or may not meet the design criteria of Reg. Guide 1.97 list. However, based upon the SONGS-1 Reg. Guide 1.97 review, upgrade of this additional instrumentation is not required. Accordingly, the following information on the radiation exposure rate indication is provided for your information only.

SONGS-1 has an Area Radiation Monitoring System, which consists of the Area Radiation Monitors and the Emergency Radiation Monitors.

The Area Radiation Monitors detect, indicate and record radiation levels and/or alarm to warn personnel of increasing radiation levels in selected areas of the plant. The following monitors detect radiation levels during normal plant operations.

R-1231 Main Control Room
R-1232 Containment Sphere
R-1233 Radio-Chemistry Laboratory
R-1234 Radwaste Building
R-1235 Sampling Room
R-1236 Spent Fuel Building
R-1237 Cryogenic Waste Gas Treatment Building

Each Area Radiation Monitor channel consists of a detector, electrical circuitry, radiation check source, indicators and alarms. Each channel detects and measures ambient gamma radiation from 10^{-2} to 10^{2} mR/hr (except R-1232 which is from 1 to 10^{4} mR/hr) in its respective area. The radiation level measured by the detector is indicated locally at the detector and in the Control Room. Radiation levels for monitors R-1231, 1232, 1233 and 1234 are also recorded in the control room.

The Emergency Radiation Monitors are high range radiation monitors which detect, indicate and record radiation levels and alarm to warn the control room of high radiation levels in selected areas of the plant and of the potential for outside radiological release. The following are the Emergency Radiation Monitors:

R-1250 Side of the Control Building
R-1251 Side of the Spent Fuel Building
R-1252 Side of the Radwaste Building

Each Emergency Radiation Monitor channel consists of a detector, electrical circuitry, radiation check source, indicators and alarms. Each channel detects and measures ambient gamma radiation from 1 to 10^8 mR/hr in its respective area. The radiation dose rate measured by the detector is indicated in the Control Room.

Additionally, a review was performed of the dose rates in SONGS-1 vital areas necessary for post-accident access. Based upon the results of this study, many shielding modifications were made to assure that personnel would be able to enter areas necessary for operator action, maintenance or repair and sampling activities. Certain of these areas are covered by the area radiation monitoring system. For the additional areas, SONGS-1 will rely on portable monitoring and sampling performed by Health Physics personnel. This instrumentation meets Reg. Guide 1.97, Category 3 guidance.

45. Vent From Steam Generator Safety Relief Valves or Atmospheric Dump Valves (3.3.45)

Reg. Guide 1.97 recommends a range of 10^{-1} to 10^{3} μCi/CC for this variable. The licensee has provided dose rate instrumentation with a range of 10^{-4} to 10^{4} R/hr in conjunction with auxiliary feedwater flow (or steam flow) for determination of release magnitude.

The existing range for this variable is not in the same units as recommended by Reg. Guide 1.97. However, the existing instrumentation is adequate to provide the necessary accident and post-accident information. Therefore, this is an acceptable deviation from Reg. Guide 1.97.

SCE Response:

No response required.

46. Airborne Radiohalogens and Particulates (portable sampling with onsite analysis capability) (3.3.46)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

This variable was not included on the SONGS-1 specific list, since the list only evaluated permanently installed hardware. The portable monitoring equipment discussed in Reg. Guide 1.97 is redundant to that required to support the Emergency Plan (EP). This equipment has recently been audited by the NRC and found to be acceptable.[20] As required by Provisional Operating License No. DPR-13, Appendix A Technical Specification Section 6.8.4.b, SONGS-1 has the necessary portable equipment to perform sampling for airborne radiohalogens and particulates in concentrations in the range of 10^{-9} μCi/CC to 10^{-3} μCi/CC in areas that might require post-accident access by plant personnel and also for the purpose of supplementing the offsite dose analyses efforts. At SONGS-1 portable air samples are used to gather the samples for analysis. Eberline SAM-2 equipment is used to analyze the samples and this equipment meets the Reg. Guide range requirement for this variable. This instrumentation meets the Reg. Guide 1.97, Category 3 guidance.

47. Plant and Environs Radiation (portable instrumentation) (3.3.47)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this instrumentation is not needed to assess offsite doses.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

This variable was not included on the SONGS-1 specific list, since the list only evaluated permanently installed hardware. The portable monitoring equipment discussed in Reg. Guide 1.97 is redundant to that required to support the EP. This equipment has recently been audited by the NRC and found to be acceptable.[20] SONGS-1 has portable instrumentation suitable to measure 10^{-3} R/hr to 10^{3} R/hr, photons and 0 rads/hr to 250 rads/hr, beta radiation and low-energy photons. This measurement is necessary to support/supplement as necessary the offsite dose analyses or personnel emergency/response actions of the emergency plan. The range of this instrumentation is adequate to determine if a specific area is accessible, based upon the analyses done for NUREG-0737, Item II.B.2, and since the portable instrumentation described here is intended to supplement permanently installed hardware, the deviation of the upper range from the Reg. Guide 1.97 guidance is acceptable. This instrumentation meets the Reg. Guide 1.97, Category 3 design guidance.

48. Plant and Environs Radioactivity (portable instrumentation) (3.3.48)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee states that this instrumentation is not needed to assess offsite doses.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

This variable was not included on the SONGS-1 specific list, since the list only evaluated permanently installed hardware. The portable monitoring equipment discussed in Reg. Guide 1.97 is redundant to that required to support the EP. This equipment has recently been audited by the NRC and found to be acceptable.[20] SONGS-1 has a multi-channel gamma ray spectrometer to support/supplement the offsite dose analysis actions of the emergency plan. The instrumentation is a nonportable unit in the health physics laboratory, but portable air samples can be taken and analyzed using this equipment. This instrumentation meets the Reg. Guide 1.97, Category 3 guidance.

49. Accident Sampling (primary coolant, containment air and sump) (3.3.49)

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737.

The licensee should provide the required information, identify any deviation from Reg. Guide 1.97 and provide supporting justification or alternatives for those deviations.

SCE Response:

This variable was not included on the SONGS-1 list since it is an analysis type of variable for long term shutdown decisions, not for immediate use in emergency response shutdown actions. This type of information may be obtained from the SONGS-1 PASS. Alternately, a diluted and/or undiluted grab sample can be taken for analysis onsite or at an offsite facility under contract to SCE. The turnaround time from undiluted grab sample to analysis results is estimated to be within 24 hours. As previously stated in SCE's response to TER Item 3.3.4, the PASS has been reviewed and found acceptable by the NRC.

SCE Response to TER Appendix B Request for Information

Reg. Guide 1.97 recommends continuous real-time display of Category 1 variables. If direct and immediate trend or transient information is essential for operator information or action, a recording should be continuously available on redundant dedicated recorders. Presumably, Class A variables should meet these criteria.

The licensee classifies the following as Type A variables.

1. RCS hot leg water temperature
2. Containment sump (containment sphere) water level
3. Containment pressure
4. Containment hydrogen concentration
5. Refueling water storage tank level
6. Auxiliary feedwater flow
7. Condensate storage tank (auxiliary feedwater tank) level

The licensee states that trending information and recording can be accomplished by the Fox 3 computer for the above variables.

The licensee should provide additional information on the Fox 3 computer. For example: why can't dedicated recorders be used?; Are the displays dedicated to the real-time display of Category 1 variables?; How many displays are there?; Are the displays redundant?; How many variables are displayed at one time?; and address the reliability of the variables displayed (human factors). In particular, how does the Fox 3 computer meet the continuous real-time display and redundant dedicated recorder criteria for Type A variables?

SCE Response:

The SONGS-1 Fox 3 computer was installed in 1982 in response to post-TMI (NUREG-0578) requirements to transmit technical data to the TSC. These requirements eventually became part of the basis for the Safety Parameter Display System (SPDS) requirements of Supplement 1 to NUREG-0737. Therefore, since the Fox 3 was installed to the early requirements of NUREG-0578, it has not been established that the Fox 3 will remain in use at SONGS-1 for the long-term. The final disposition of an SPDS, and the future use of the Fox 3, will be stated in the CRDR summary report due to the NRC by August 14, 1987. The final disposition of an SPDS at SONGS-1 will also address, if appropriate, the disposition of recording/data transmission capability that has been relied upon to resolve other NRC requirements, such as post-trip review and Reg. Guide 1.97.

Notwithstanding the status described above, the Fox 3 has been described in previous SCE to NRC correspondence regarding the SONGS-1 response to NRC Generic Letter 83-28. Specifically, Generic Letter 83-28 required an evaluation of plant specific post-trip review capabilities. In response, SCE has provided information related to control room data recorders and the capabilities of the Fox-3 computer to satisfy the NRC requirements. Therefore, it is appropriate that NRC review in the area of Generic Letter 83-28 resolve the recording capability requirements for SONGS-1. The Fox-3 computer was also looked at as part of the recent NRC Emergency Response Facilities Audit (Reference 20). The following information is offered specifically for completion of the Reg. Guide 1.97 review.

As described in previous correspondence with the NRC (Reference 13 and 14), the Fox 3 computer is located in the TSC, which is immediately adjacent to the control room. The Fox 3 has an input/output terminal in the Fox 3 with both video display and printer capability. The variables on the Fox 3 can be displayed singly, graphically or as an array of variables that are updated every 5 seconds. The "recording capability" is essentially the printing of historical data from the computer memory.

The TSC is accessible to the control room via a connecting doorway and/or a pass through box, which can be used to pass plant status or trending information into the control room from the TSC. The TSC is fully staffed within 1 hour of an accident by personnel trained in the use of the Fox 3. However, many of the TSC staff, including personnel trained in the use of the Fox 3, arrive to perform their post-accident TSC duties on the order of 15 to 30 minutes. Additionally, the SONGS-1 shift Technical Advisors (STAs), and some control room operators, have received, to a lesser extent, training in the use of the Fox 3. Therefore, it is not anticipated that the lack of recorded information in the control room will affect any post-accident operator decisions and/or actions. It is also noted that the type of post-accident responses that require trending information are evaluations of options or long-term action plans. Therefore, these responses are not considered to be decisions and/or actions that require immediately available recorded information. In those cases where immediately available trend information is required to implement the SONGS-1 EOIs, it is provided.

Therefore, given the existing Fox 3 recording capability and the need basis for post-accident recording capability, the installation of additional SONGS-1 control room recorders is not considered necessary nor is any such upgrade planned for SONGS-1. Additionally, it is noted that any SONGS-1 SPDS upgrade will be cognizant of any credit taken for the Fox 3 in the area of post-accident recording and will not reduce any of this capability.

IV. REFERENCES

1. Letter, M. O. Medford, SCE, to G. E. Lear, NRC, Regulatory Guide 1.97 Review, December 16, 1985

2. Letter, R. F. Dudley, NRC, to Kenneth P. Baskin, SCE, Transmittal of Technical Evaluation Report (TER) Regarding Regulatory Guide 1.97 Conformance, December 22, 1986

3. "Instrumentation for Light-Water Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," USNRC Regulatory Guide 1.97, Rev. 2, December 1980

4. Letter, M. O. Medford, SCE, to J. A. Zwolinski, NRC, NUREG-0737, Item I.C.1 - Emergency Operating Procedures, April 12, 1985

5. SONGS-1 Emergency Operating Instructions

6. Westinghouse Owners Group Emergency Response Guidelines

7. Letter, D. G. Eisenhut, NRC, to All Licensees of Westinghouse Pressurized Water Reactors, Safety Evaluation of "Emergency Response Guidelines" (Generic Letter 83-22), June 3, 1983

8. Letter, T. M. Novak, NRC, to D. Butterfield, WOG, Supplemental Safety Evaluation Report by the Office of Nuclear Reactor Regulation in the Matter of Westinghouse Owners Group Emergency Response Guidelines, December 26, 1985

9. Letter, M. O. Medford, SCE, to H. L. Thompson, Jr., NRC, Supplement 1 to NUREG-0737, Requirements for Emergency Response Capability (Generic Letter No. 82-33), April 23, 1985

10. Letter, D. M. Crutchfield, NRC, to R. Dietch, SCE, TMI Action Plan Item II.B.3, Post-Accident Sampling System, September 1, 1983

11. Letter, J. A. Zwolinski, NRC, to Kenneth Baskin, SCE, NUREG-0737, Item II.B.3 - Post-Accident Sampling System, November 7, 1985

12. Letter, R. F. Dudley, NRC, to Kenneth P. Baskin, SCE Post-Accident Sampling System (PASS), November 12, 1986

13. Letter, D. M. Crutchfield, NRC, to K. P. Baskin, SCE, NUREG-0737, Items II.F.1.4, 5 and 6, April 16, 1984.

14. Letter. W. A. Paulson, NRC, to K. P. Baskin, SCE, NUREG-0737, Item II.F.1.4, August 3, 1984.

15. Letter, M. O. Medford, SCE, to H. L. Thompson, NRC, Inadequate Core Cooling (ICC) Instrumentation, June 20, 1986

16. Letter, M. O. Medford, SCE, to W. A. Paulson, NRC, Post-Accident Sampling Capability, August 14, 1984

17. "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," USNRC Regulatory Guide 1.97, Rev. 3, dated May 1983

18. Letter, M. O. Medford, SCE, to J. A. Zwolinski, NRC, TMI Action Item II.K.3.5, "Automatic Trip of Reactor Coolant Pumps," October 10, 1985

19. Letter, M. O. Medford, SCE, to G. E. Lear, NRC, SEP Topic II-1.C, Offsite Hazards, NUREG-0737, Item III.D.3.4 - Control Room Habitability, October 10, 1986

20. Letter, F. A. Wenslawski, NRC, to Kenneth P. Baskin, SCE, Emergency Response Facilities Appraisal, October 31, 1986

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