SOUTHERN CALIFORNIA
EDISON
An *EDISON INTERNATIONAL*SM Company

Dwight E. Nunn
Vice President

March 11, 2002

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

SUBJECT: **San Onofre Nuclear Generating Station, Units 2 and 3**
Docket Nos. 50-361, 50-362
Proposed Change Number 539
Technical Specification 1.1, "Definitions"

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Southern California Edison (SCE) hereby requests the following amendment: a change to Technical Specification Section 1.1, "Definitions," to allow either an allocated or a measured response time to be utilized for the sensors in the Reactor Protective System and Engineered Safety Features Actuation System instrument loops. SCE has evaluated this request under the standards set forth in 10 CFR 50.92(c) and determined that a finding of "no significant hazards consideration" is justified.

SCE requests approval of the proposed amendment by October 31, 2002 in order to allow for implementation prior to the start of the Unit 3 refueling outage scheduled for January, 2003. Once approved, the amendment shall be implemented within 60 days.

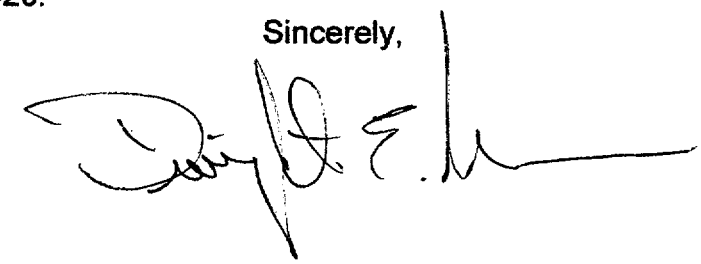
SCE commits to revising the Technical Specification Bases as shown (for information only) in Attachments 3 and 4, and makes no other formal commitments that would derive from NRC approval of the proposed amendment.

A001

P. O. Box 128
San Clemente, CA 92674-0128
949-368-1480
Fax 949-368-1490

If you should have any questions regarding this submittal, please contact Mr. Jack Rainsberry at 949-368-7420.

Sincerely,



Attachments:
1. Notarized Affidavit
2. Licensee's Evaluation
3. Markup of Technical Specification pages and Bases (for information only) pages
4. Retyped Technical Specification pages and Bases (for information only) pages

cc: E. W. Merschoff, Regional Administrator, NRC Region IV
C. C. Osterholtz, NRC Senior Resident Inspector, San Onofre Units 2 and 3
L. Raghavan, NRC Project Manager, San Onofre Units 2 and 3
S. Y. Hsu, Department of Health Services, Radiologic Health Branch

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Application of SOUTHERN, CALIFORNIA EDISON COMPANY, ET AL. for a class 103 License to Acquire, Possess, and Use a Utilization Facility as Part of Unit No. 2 of the San Onofre Nuclear Generating Station	)	Docket No. 50-361 Amendment Application No. 216

SOUTHERN CALIFORNIA EDISON COMPANY, ET AL. pursuant to 10CFR50.90, hereby submit Amendment Application No. 216. This amendment application consists of Proposed Change No. PCN-539 to Facility Operating License NPF-10. PCN-539 is a request to revise Section 1.1, "Definitions," of the Technical Specifications for San Onofre Nuclear Generating Station Unit 2.

State of California
County of San Diego

Subscribed and sworn to (or affirmed) before me this 11th day of March, 2002.

By: _____
Dwight E. Nunn
Vice President

_____
Notary Public

MARIANE SANCHEZ
Commission #1196482
Notary Public - California
San Diego County
My Comm. Expires Oct 14, 2002

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Application of SOUTHERN, CALIFORNIA EDISON COMPANY, ET AL. for a class 103 License to Acquire, Possess, and Use a Utilization Facility as Part of Unit No. 3 of the San Onofre Nuclear Generating Station	)	Docket No. 50-362 Amendment Application No. 201

SOUTHERN CALIFORNIA EDISON COMPANY, ET AL. pursuant to 10CFR50.90, hereby submit Amendment Application No. 201. This amendment application consists of Proposed Change No. PCN-539 to Facility Operating License NPF-15. PCN-539 is a request to revise Section 1.1, "Definitions," of the Technical Specifications for San Onofre Nuclear Generating Station Unit 3.

State of California
County of San Diego

Subscribed and sworn to (or affirmed) before me this 11th day of March, 2002.

By: _____
Dwight E. Nunn
Vice President

_____
Notary Public

MARIANE SANCHEZ
Commission #1196482
Notary Public - California
San Diego County
My Comm. Expires Oct 14, 2002

ATTACHMENT 2
SAN ONOFRE NUCLEAR GENERATING STATION
PCN-539

LICENSEE'S EVALUATION

1. INTRODUCTION
2. DESCRIPTION OF PROPOSED AMENDMENT
3. BACKGROUND
4. REGULATORY REQUIREMENTS & GUIDANCE
5. TECHNICAL ANALYSIS
6. REGULATORY ANALYSIS
7. NO SIGNIFICANT HAZARDS CONSIDERATION
8. ENVIRONMENTAL CONSIDERATION
9. PRECEDENT
10. REFERENCES

1.0 INTRODUCTION

This letter is a request to amend Operating Licenses NPF-10 and NPF-15 for the San Onofre Nuclear Generating Station Units 2 and 3 (SONGS 2 & 3), respectively.

The proposed change would revise the Operating Licenses to amend the Technical Specifications (TS) Definitions, Section 1.1, so as to revise the definition of response time testing (RTT) as it is applied to the Engineered Safety Features (ESF) System RTT and the Reactor Protective System (RPS) RTT. As an alternative to the current method of determining response time, in which a measured sensor response time is obtained, the proposed amendment of the definitions would allow substitution of an allocated sensor response time. The sensor response time (measured or allocated) would be used in determining that the overall system response time is within TS limits. Allocated sensor response time would be obtained from the sensor manufacturer or derived from plant data obtained from previous RTT.

This change is based on approved Technical Specification Task Force (TSTF) Traveler TSTF 368, Revision 0, "Incorporate Combustion Engineering Owners Group (CEOG) Topical Report to Eliminate Pressure Sensor Response Time Testing." This TSTF implements the conclusions of Combustion Engineering topical report NPSD-1167, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements." TSTF 368 was recently incorporated into Revision 2 of NUREG-1432.

2.0 DESCRIPTION OF PROPOSED AMENDMENT

TS Section 1.1, "Definitions," would be revised as follows.

The definition for ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME currently reads:

> The ESF RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays, where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.

To this definition would be appended the following:

> In lieu of measurement, response time may be verified for selected components provided that the components and methodology for verification have been previously reviewed and approved by the NRC.

In like manner, the definition for REACTOR PROTECTIVE SYSTEM (RPS) RESPONSE TIME currently reads:

> The RPS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RPS trip setpoint at the channel sensor until electrical power to the CEAs drive mechanism is interrupted. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.

To this definition would be appended the following:

> In lieu of measurement, response time may be verified for selected components provided that the components and methodology for verification have been previously reviewed and approved by the NRC.

In summary, the proposed change would allow either an allocated or a measured response time to be utilized for selected sensors in the Reactor Protective System and Engineered Safety Features System instrument loops.

Additionally, Southern California Edison (SCE) will revise the TS Bases, as shown (for information only) in Attachments 3 and 4, for TS 3.3.1, "Reactor Protective System (RPS) Instrumentation--Operating," and TS 3.3.5, "Engineered Safety Features Actuation System Instrumentation," to clarify the provision to verify response times in lieu of measuring them. The CEOG Topical Report will also be explicitly referenced in the revised section of the TS Bases. Proposed TS Bases changes, using NUREG-1432 Rev. 2 as guidance, are included in this submittal for information only. SCE has chosen to slightly modify the Bases wording from that included in NUREG-1432 Rev. 2. SCE intends to delete the current sentence reading, "Testing may be performed in one measurement or in overlapping segments, with verification that all components are tested." SCE finds this sentence to be redundant with the newly added following sentence reading, "Response time may be verified by any series of sequential, overlapping or total channel measurements, including allocated sensor response time, such that the response time is verified."

SCE further intends to add a sentence to the end of the new Bases paragraphs clarifying explicitly the requirement for a replaced or repaired sensor: "The replaced or repaired sensor must be tested to determine actual response time."

3.0 BACKGROUND

The Reactor Protective System (RPS) initiates a reactor trip to protect against violating the core specified acceptable fuel design limits and breaching the reactor coolant pressure boundary during anticipated operational occurrences. By tripping the reactor, the RPS also assists the Engineered Safety Features (ESF) systems in mitigating accidents. The protection and monitoring systems have been designed to ensure safe operation of the reactor.

The RPS consists of sensors, calculators, logic, and other equipment necessary to monitor selected nuclear steam supply system conditions and to effect reliable and rapid reactor shutdown (reactor trip) if any or a combination of the monitored conditions approach specified trip setpoints. The system's functions are to protect the core fuel design limits and reactor coolant system (RCS) pressure boundary for anticipated operational occurrences and also to provide assistance in limiting conditions for certain accidents.

Engineered safety features protect the public and plant personnel in the highly unlikely event of an accidental release of radioactive fission products from the reactor system, particularly as the result of loss-of-coolant accidents. These safeguards function to localize, control, mitigate, and terminate such accidents to hold exposure levels below 10CFR100 limits.

The TS require demonstration that protective functions will occur within the time required by the plant accident analysis. This protective function time requirement starts when the process variable, such as pressure or level, exceeds the setpoint for that variable and continues until the protective function is accomplished. For example, response time could be from when a parameter exceeds its setpoint until a required pump is turned on, achieves rated speed, and delivers the required flow. Currently, SONGS 2 & 3 performs an in-field measurement of the various response times by testing the entire circuit using a series of sequential steps, overlapping steps, or total steps. The proposed change would allow either an allocated or a measured response time to be utilized for selected sensors in the RPS and ESF system instrument loops.

This change is based on approved Technical Specification Task Force (TSTF) Traveler TSTF 368, Revision 0, "Incorporate Combustion Engineering Owners Group (CEOG) Topical Report to Eliminate Pressure Sensor Response Time Testing." This TSTF implements the conclusions of Combustion Engineering topical report NPSD-1167, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements." TSTF 368 was recently incorporated into Revision 2 of NUREG-1432.

4.0 REGULATORY REQUIREMENTS & GUIDANCE

Appendix A to 10 CFR 50 enumerates General Design Criteria for the design, fabrication, construction, testing and performance of structures, systems and components important to the safety of water-cooled nuclear power plants. Included among the General Design Criteria are Criteria 20 and 21 for reactor protection system functions and their reliability and testability. Also included are Criteria 35 and 37 for emergency core cooling system functions and their testing.

CEOG Topical Report CE NPSD 1167, Revision 2, was submitted as a final report to the NRC in May 2000. The NRC staff issued a safety evaluation for Revision 2 of the topical report on July 24, 2000. The topical report justifies the substitution of an allocated sensor response time for ESF system and RPS pressure sensors. To incorporate this change, the definition of ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME and the definition of REACTOR PROTECTIVE SYSTEM (RPS) RESPONSE TIME need to be revised. This will apply only to selected components provided that the components and methodology for verification have been previously reviewed and approved by the NRC.

NRC staff approved TSTF Traveler TSTF 368, Revision 0, "Incorporate Combustion Engineering Owners Group (CEOG) Topical Report to Eliminate Pressure Sensor Response Time Testing," incorporating topical report NPSD-1167, Revision 2, on November 28, 2000, as documented by letter from William D. Beckner (NRC) to Anthony R. Pietrangelo (NEI) dated January 25, 2001.

5.0 TECHNICAL ANALYSIS

Table 1 contains a list of transmitters covered by this request to utilize allocated response times. The use of allocated response times in these applications is considered to be acceptable as long as the components and methodology for verification have been previously reviewed and approved by the NRC. SONGS 2 & 3 would modify plant procedures based on the recommendation in TSTF 368 prior to using allocated response times for the sensors and measurement of the remainder of the ESF system or RPS loops associated with these transmitters.

TABLE 1

Instrument	**Make / Model**	**Allocated Response Time**
RCS Low Flow	Rosemount Model 1153 Range Code 6	.200 second
Containment Pressure	Foxboro Model N-E11 DM	.430 second
SG Level	Weed Model N-E13 DM	.520 second
Pressurizer Pressure	Rosemount Model 1154, Range Code 9 Weed Model N-E11 GM	.200 second .135 second
RWT Level	Foxboro Model E13 DM	.610 second
SG Pressure (RPS and ASGT*)	Weed Model N-E11 GM	.135 second

*Asymmetric Steam Generator Transient

The basis for the elimination of response time testing (RTT) is contained in IEEE 338-1977, Section 6.3.4, paragraph 3 (page 11). This section states: "Response time testing of all safety-related equipment, per se, is not required if, in lieu of response time testing, the response time of the safety equipment is verified by functional testing, calibration checks or other tests, or both. This is acceptable if it can be demonstrated that changes in response time beyond acceptable limits are accompanied by changes in performance characteristics which are detectable during routine periodic tests." This IEEE standard was endorsed by Regulatory Guide 1.118, "Periodic Testing of Electric Power and Protection Systems."

In 1991, an Electric Power Research Institute (EPRI) Report, NP-7243, "Investigation of Response Time Testing Requirements," was issued. This report included a failure mode and effects analysis of certain sensors as well as an evaluation of response time test data. The report determined that for the selected sensors, any failure that would affect the response time characteristics of the sensors would also affect the calibration and other routine surveillances. Therefore, a separate response time test need not be required to demonstrate response time assumptions used in the Final Safety Analysis Report (FSAR).

CEOG Topical Report CE NPSD-1167 only allows substitution of an allocated response time for the sensor and leaves intact the requirement to measure the response time of the rest of the system performing the protective function. Since the time required by the accident analysis is the summation of all response times of components within the protective function, some value for the sensor response time must be used in lieu of an actual measured value to determine the overall protective system response time. This value is that time allocated to the response of the sensor. CE NPSD-1167 indicates that these values are derived from two sources: either from the original equipment manufacturer or from a statistical analysis of the results of previous RTTs. If a statistical analysis is performed, it must be sufficiently conservative to ensure that the allocated response time assigned to the sensor will be valid for 95 percent of the population of sensors, with a 95 percent confidence level. An acceptable methodology for this determination is contained in NUREG-1475, "Applying Statistics," April 1994.

EPRI Topical Report NP-7243, Revision 1, is the report upon which the CEOG based its Topical Report NPSD-1167 for elimination of RTT. This EPRI topical report includes several recommendations for actions to ensure sensors are operating correctly and that calibration or other surveillances will provide an accurate indication that the dynamic characteristics of the instrument will be accurately reflected in a static calibration. The CEOG has included these four recommendations in its topical report and has suggested that utilities pursuing elimination of sensor RTT incorporate the recommended actions into their revised RTT program. These recommendations and the SONGS Units 2 & 3 position are as follows:

Question 1. Perform a hydraulic RTT prior to installation of a new transmitter/switch or following refurbishment of the transmitter/switch (e.g., sensor cell or variable damping components) to determine an initial sensor-specific response time value. The power interrupt test is an alternate method to use on force-balance transmitters; the purpose of this test is to verify sensor response time is within the limits of the allocated value for the transmitter function.

SONGS 2 & 3 Response:

SONGS 2 & 3 performs pre-installation RTT. This testing is performed under procedures SO23-II-3.1,3.2,3.3, and 3.4; "Surveillance Requirement for Plant Protection System Response Time Test for Channel A," "...Channel B," "...Channel C," and "...Channel D," respectively. The test utilizes a hydraulic ramp generator and a Teledyne reference transducer. A ramp test is performed in the direction of use (i.e., from high to low pressure for a low trip and low to high for a high trip.)

Question 2. For transmitters and switches that use capillary tubes, RTT should be performed after initial installation and after any maintenance or modification activity that could damage the capillary tubes.

SONGS 2 & 3 Response:

The SONGS 2 & 3 configuration does not include any Rosemount transmitters with capillary tubes in these RPS or ESF system applications. All of the pressure transmitters in these applications are connected to the process piping using I/2 inch OD SS316 tubing.

Question 3. Perform periodic drift monitoring on all Rosemount pressure and differential pressure transmitters, models 1151, 1152, 1153 and 1154. Guidance on drift monitoring can be found in EPRI NP-7121 and Rosemount Technical Bulletins. Drift monitoring intervals should be based on utility response to NRC Bulletin 90-01.

SONGS 2 & 3 Response:

On March 9, 1990 the NRC issued NRC Bulletin 90-01, "Loss of Fill-Oil in Transmitters Manufactured by Rosemount", and on December 22, 1992 issued Supplement 1 to this bulletin. SCE provided responses to the NRC detailing the actions being taken in response to the bulletin in letters dated July 19, 1990, March 4, 1993, and February 11, 1994, respectively. SCE will continue to comply with the actions requested by the NRC, including periodic drift monitoring, for Rosemount Model 1153 Series B and D, the Model 1154 transmitters manufactured prior to July 11, 1989 except for the monitoring frequency of category 1b transmitters which may exceed the 24 month monitoring frequency limit provided in the Bulletin (SONGS 2 & 3 operate on a 24 month refueling cycle). By letter and safety evaluation dated April 12, 1995, the NRC staff found the SCE responses to Bulletin 90-01 Supplement 1, to be acceptable.

Question 4. If variable damping is used, implement a method to ensure that the potentiometer is at the required setting and cannot be inadvertently changed. This approach should eliminate the need for RTT to detect a variable damping failure mode. Otherwise, RTT each transmitter by hydraulic or electronic white noise analysis methods, at a minimum, following each transmitter calibration.

SONGS 2 & 3 Response:

The SONGS 2 & 3 configuration does not include any RPS/ESF transmitters with the variable damping feature.

6.0 REGULATORY ANALYSIS

This proposed amendment is based on the identified CEOG, EPRI, and NUREG documents associated with Technical Specification Task Force Traveler TSTF 368, Revision 0, "Incorporate Combustion Engineering Owners Group (CEOG) Topical Report to Eliminate Pressure Sensor Response Time Testing." These documents provide adequate justification and guidance for determining allocated sensor response time as well as adequate justification that failed sensors will be identified by other surveillance testing that is not affected by this amendment request.

Since the overall system response times are unchanged, this proposed amendment does not change, degrade, or prevent actions described or assumed in any accident analysis. It will not alter any assumptions previously made in evaluating radiological consequences or affect any fission product barriers. It does not increase any challenges to safety systems. Therefore, this proposed amendment would not increase or have any impact on the consequences of events described and evaluated in Chapter 6 or Chapter 15 of the SONGS 2 & 3 Updated Final Safety Analysis Report.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

7.0 NO SIGNIFICANT HAZARDS CONSIDERATION

Southern California Edison has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. **Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   Response: No.

   The proposed amendment to the Technical Specification (TS) Definitions for Engineered Safety Feature (ESF) Response Time and Reactor Protective System (RPS) Response Time allows substitution of an allocated sensor response time in lieu of measuring sensor response time. Response time testing is not an initiator of any accident previously evaluated. Further, overall system response time will continue to meet Technical Specification requirements. The allocated sensor response times allowed in lieu of measurement have been determined to adequately represent the response time of the components such that the safety systems utilizing those components will continue to perform their accident mitigation function as assumed in the safety analysis. Therefore, the proposed change does not involve a significant increase in the probability or consequences of any accident previously evaluated.

2. **Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?**

Response: No.

The proposed amendment to TS Section 1.1, "Definitions," allows the substitution of an allocated sensor response time in lieu of sensor response time testing for selected components. The proposed change does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. **Does the proposed change involve a significant reduction in a margin of safety?**

Response: No.

The proposed amendment to TS Section 1.1, "Definitions," allows the substitution of an allocated sensor response time in lieu of measured sensor response time for certain pressure sensors. The allocated pressure sensor response times allowed in lieu of measurement have been determined to adequately represent the response time of the components such that the safety systems utilizing those components will continue to perform their accident mitigation function as assumed in the safety analysis. Therefore, the proposed change does not involve a significant reduction in the margin of safety.

Based on the above, Southern California Edison concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

8.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

9.0 PRECEDENT

Similar amendment requests have been approved including the following:

Letter from John T. Herron, Entergy Operations, Inc., to the Document Control Desk, Subject: Waterford 3 SES, Docket No. 50-382, License No. NPF-38, Technical Specification Change Request NPF-38-235, ESFAS/RPS Sensor Response Time Testing. Dated July 18, 2001, Approved October 29, 2001.

10.0 REFERENCES

1. Letter, William D. Beckner (NRC) to Anthony R. Pietrangelo (NEI) dated January 25, 2001.

2. Technical Specification Task Force Traveler TSTF 368 Revision 2

3. CEOG Topical Report CE NPSD-1167, "Elimination of Pressure Sensor Response Time Testing Requirements," Revision 2

ATTACHMENT 3
SAN ONOFRE NUCLEAR GENERATING STATION
PCN-539

MARKUP OF TECHNICAL SPECIFICATION PAGES
AND BASES (for information only) PAGES

1.1 Definitions

CORE ALTERATION (continued)	within the reactor vessel with the vessel head removed and fuel in the vessel. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.
CORE OPERATING LIMITS REPORT (COLR)	The COLR is the unit specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific parameter limits shall be determined for each reload cycle in accordance with Specification 5.7.1.5. Plant operation within these limits is addressed in individual Specifications.
DOSE EQUIVALENT I-131	DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries/gram) that alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in ICRP-30, Supplement to Part 1, pages 192-212, Tables titled, "Committed Dose Equivalent in Target Organs or Tissues per Intake of Unit Activity."
$\bar{E}$ - AVERAGE DISINTEGRATION ENERGY	$\bar{E}$ shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration (in MeV) for isotopes, other than iodines, with half lives > 15 minutes, making up at least 95% of the total noniodine activity in the coolant.
ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME	The ESF RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays, where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of

(continued)

1.1 Definitions

ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME (Continued)	measurement, response time may be verified for selected components provided that the components and methodology for verification have been previously reviewed and approved by the NRC.
LEAKAGE	LEAKAGE shall be: a. Identified LEAKAGE 1. LEAKAGE, such as that from pump seals or valve packing (except reactor coolant pump (RCP) leakoff), that is captured and conducted to collection systems or a sump or collecting tank; 2. LEAKAGE into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be pressure boundary LEAKAGE; or 3. Reactor Coolant System (RCS) LEAKAGE through a steam generator (SG) to the Secondary System. b. Unidentified LEAKAGE All LEAKAGE that is not identified LEAKAGE. c. Pressure Boundary LEAKAGE LEAKAGE (except SG LEAKAGE) through a nonisolable fault in an RCS component body, pipe wall, or vessel wall.
MODE	A MODE shall correspond to any one inclusive combination of core reactivity condition, power level, average reactor coolant temperature, and reactor vessel head closure bolt tensioning specified in Table 1.1-1 with fuel in the reactor vessel.

(continued)

1.1 Definitions

OPERABLE – OPERABILITY	A system, subsystem, train, component, or device shall be OPERABLE when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).
PHYSICS TESTS	PHYSICS TESTS shall be those tests performed to measure the fundamental nuclear characteristics of the reactor core and related instrumentation. These tests are: a. Described in Chapter 14, Initial Test Program of the SONGS Units 2 and 3 UFSAR; b. Authorized under the provisions of 10 CFR 50.59; or c. Otherwise approved by the Nuclear Regulatory Commission.
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 3438 MWt.
REACTOR PROTECTIVE SYSTEM (RPS) RESPONSE TIME	The RPS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RPS trip setpoint at the channel sensor until electrical power to the CEAs drive mechanism is interrupted. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and methodology for verification have been previously reviewed and approved by the NRC.
SHUTDOWN MARGIN (SDM)	SDM shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming:

(continued)

1.1 Definitions

SHUTDOWN MARGIN (SDM) (continued)	a. All full length CEAs (shutdown and regulating) are fully inserted except for the single CEA of highest reactivity worth, which is assumed to be fully withdrawn. However, with all CEAs verified fully inserted by two independent means, it is not necessary to account for a stuck CEA in the SDM calculation. b. In MODES 1 and 2, the fuel and moderator temperatures are changed to the corrected hot zero power condition. c. There is no change in part length CEA position. With any CEAs not capable of being fully inserted, the reactivity worth of these CEAs must be accounted for in the determination of SDM.
STAGGERED TEST BASIS	A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function.
THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.13

This SR ensures that the RPS RESPONSE TIMES are verified to be less than or equal to the maximum values assumed in the safety analysis. Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor to the point at which the RTCBs open. Response times are conducted on an 24 month STAGGERED TEST BASIS. This results in the interval between successive surveillances of a given channel of n x 24 months, where n is the number of channels in the function. The Frequency of 24 months is based upon operating experience, which has shown that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences. Also, response times cannot be determined at power, since equipment operation is required. ~~Testing may be performed in one measurement or in overlapping segments, with verification that all components are tested.~~

Response time may be verified by any series of sequential, overlapping or total channel measurements, including allocated sensor response time, such that the response time is verified. Allocations for sensor response times may be obtained from records of test results, vendor test data, or vendor engineering specifications. Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements," Reference 13, provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the Topical Report. Response time verification for other sensor types must be demonstrated by test. The allocation of sensor response times must be verified prior to placing a new component in operation and reverified after maintenance that may adversely affect the sensor response time. The replaced or repaired sensor must be tested to determine actual response time.

A Note is added to indicate that the neutron detectors are excluded from RPS RESPONSE TIME testing because they are passive devices with minimal drift and because of the difficulty of simulating a meaningful signal. Slow changes in leakage of neutrons with core burnup are compensated for by performing the daily calorimetric calibration (SR 3.3.1.4).

(continued)

BASES (continued)

REFERENCES

1. 10 CFR 20.

2. 10 CFR 100.

3. IEEE Standard 279-1971, April 5, 1972.

4. SONGS Units 2 and 3 UFSAR, Chapter 15.

5. 10 CFR 50.49.

6. PPS Setpoint Calculation CE-NPSD-570, Revision 3.

7. UFSAR, Section 7.2.

8. CEN-327, June 2, 1986, including Supplement 1, March 3, 1989.

9. RPS/ESFAS Extended Test Interval Evaluation for 120 Days Staggered Testing at SONGS Units 2 and 3, Calculation Number 09/010-AS93-C-002, November 1993.

10. Methodology for Developing Risk-Based Surveillance Programs for Safety-Related Equipment at San Onofre Nuclear Generating Station Units 2 and 3, PLG-0575, April 1992.

11. NRC Safety Evaluation Report for SONGS Unit 2 Operating License Amendment No. 150 dated February 12, 1999.

12. NRC Safety Evaluation Report for SONGS Unit 2 Operating License Amendment No. 142 dated September 25, 1998.

13. CEOG Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements."

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

functions, if applicable. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive surveillances. Measurement error determination, setpoint error determination, and calibration adjustment must be performed consistent with the plant specific setpoint analysis. The channel shall be left calibrated consistent with the assumptions of the current plant specific setpoint analysis. The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.

SR 3.3.5.6

This Surveillance ensures that the train actuation response times are within the maximum values assumed in the safety analyses.

Response time testing acceptance criteria are included in Reference 9.

Response time may be verified by any series of sequential, overlapping or total channel measurements, including allocated sensor response time, such that the response time is verified. Allocations for sensor response times may be obtained from records of test results, vendor test data, or vendor engineering specifications. Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements," Reference 12, provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the Topical Report. Response time verification for other sensor types must be demonstrated by test. The allocation of sensor response times must be verified prior to placing a new component in operation and reverified after maintenance that may adversely affect the sensor response time. The replaced or repaired sensor must be tested to determine actual response time.

ESF RESPONSE TIME tests are conducted on a STAGGERED TEST BASIS of once every 24 months. The 24 month Frequency is consistent with the typical industry refueling cycle and is

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

based upon plant operating experience,which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

SR 3.3.5.7

SR 3.3.5.7 is a CHANNEL FUNCTIONAL TEST similar to SR 3.3.5.2 and SR 3.3.5.3, except SR 3.3.5.7 is performed within 120 days prior to startup and is only applicable to bypass functions. Since the Pressurizer Pressure – Low bypass is identical for both the RPS and ESFAS, this is the same Surveillance performed for the RPS in SR 3.3.1.13.

The CHANNEL FUNCTIONAL TEST for proper operation of the bypass permissives is critical during plant heatups because the bypasses may be in place prior to entering MODE 3 but must be removed at the appropriate points during plant startup to enable the ESFAS Function. Consequently, just prior to startup is the appropriate time to verify bypass function OPERABILITY. Once the bypasses are removed, the bypasses must not fail in such a way that the associated ESFAS Function is inappropriately bypassed. This feature is verified by SR 3.3.5.2. The allowance to conduct this test once within 120 days prior to each reactor startup is based on a plant specific report based on the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Refs. 8 and 10).

REFERENCES

1. SONGS Units 2 and 3 UFSAR, Section 7.3.
2. 10 CFR 50, Appendix A.
3. IEEE Standard 279-1971.
4. SONGS Units 2 and 3 UFSAR, Chapter 15.
5. 10 CFR 50.49.
6. PPS Setpoint Calculation CE-NPSD-570.
7. SONGS Units 2 and 3 UFSAR, Section 7.2.
8. CEN-327, May 1986, including Supplement 1, March 1989.

(continued)

BASES (continued)

REFERENCES (Continued)

9. Licensee Controlled Specification 3.3.100, "RPS/ESFAS Response Times."

10. RPS/ESFAS Extended Test Interval Evaluation for 120 Days Staggered Testing at SONGS Units 2 and 3, Calculation Number 09/010-AS93-C-002, November 1993.

11. Report NSG 98-007, "Time Limit for RAS or EFAS Channel in Trip," April 17, 1998.

12. CEOG Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements."

1.1 Definitions

CORE ALTERATION (continued)	within the reactor vessel with the vessel head removed and fuel in the vessel. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.
CORE OPERATING LIMITS REPORT (COLR)	The COLR is the unit specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific parameter limits shall be determined for each reload cycle in accordance with Specification 5.7.1.5. Plant operation within these limits is addressed in individual Specifications.
DOSE EQUIVALENT I-131	DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries/gram) that alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in ICRP-30, Supplement to Part 1, pages 192-212, Tables titled, "Committed Dose Equivalent in Target Organs or Tissues per Intake of Unit Activity."
$\bar{E}$ - AVERAGE DISINTEGRATION ENERGY	$\bar{E}$ shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration (in MeV) for isotopes, other than iodines, with half lives > 15 minutes, making up at least 95% of the total noniodine activity in the coolant.
ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME	The ESF RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays, where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of

(continued)

1.1 Definitions

ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME (Continued)	measurement, response time may be verified for selected components provided that the components and methodology for verification have been previously reviewed and approved by the NRC.
LEAKAGE	LEAKAGE shall be: a. Identified LEAKAGE 1. LEAKAGE, such as that from pump seals or valve packing (except reactor coolant pump (RCP) leakoff), that is captured and conducted to collection systems or a sump or collecting tank; 2. LEAKAGE into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be pressure boundary LEAKAGE; or 3. Reactor Coolant System (RCS) LEAKAGE through a steam generator (SG) to the Secondary System. b. Unidentified LEAKAGE All LEAKAGE that is not identified LEAKAGE. c. Pressure Boundary LEAKAGE LEAKAGE (except SG LEAKAGE) through a nonisolable fault in an RCS component body, pipe wall, or vessel wall.
MODE	A MODE shall correspond to any one inclusive combination of core reactivity condition, power level, average reactor coolant temperature, and reactor vessel head closure bolt tensioning specified in Table 1.1-1 with fuel in the reactor vessel.

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1.1 Definitions

OPERABLE – OPERABILITY	A system, subsystem, train, component, or device shall be OPERABLE when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).
PHYSICS TESTS	PHYSICS TESTS shall be those tests performed to measure the fundamental nuclear characteristics of the reactor core and related instrumentation. These tests are: a. Described in Chapter 14, Initial Test Program of the SONGS Units 2 and 3 UFSAR; b. Authorized under the provisions of 10 CFR 50.59; or c. Otherwise approved by the Nuclear Regulatory Commission.
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 3438 MWt.
REACTOR PROTECTIVE SYSTEM (RPS) RESPONSE TIME	The RPS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RPS trip setpoint at the channel sensor until electrical power to the CEAs drive mechanism is interrupted. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and methodology for verification have been previously reviewed and approved by the NRC.
SHUTDOWN MARGIN (SDM)	SDM shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming:

(continued)

1.1 Definitions

SHUTDOWN MARGIN (SDM) (continued)	a. All full length CEAs (shutdown and regulating) are fully inserted except for the single CEA of highest reactivity worth, which is assumed to be fully withdrawn. However, with all CEAs verified fully inserted by two independent means, it is not necessary to account for a stuck CEA in the SDM calculation. b. In MODES 1 and 2, the fuel and moderator temperatures are changed to the corrected hot zero power condition. c. There is no change in part length CEA position. With any CEAs not capable of being fully inserted, the reactivity worth of these CEAs must be accounted for in the determination of SDM.
STAGGERED TEST BASIS	A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function.
THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.13

This SR ensures that the RPS RESPONSE TIMES are verified to be less than or equal to the maximum values assumed in the safety analysis. Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor to the point at which the RTCBs open. Response times are conducted on an 24 month STAGGERED TEST BASIS. This results in the interval between successive surveillances of a given channel of n x 24 months, where n is the number of channels in the function. The Frequency of 24 months is based upon operating experience, which has shown that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences. Also, response times cannot be determined at power, since equipment operation is required. ~~Testing may be performed in one measurement or in overlapping segments, with verification that all components are tested.~~

Response time may be verified by any series of sequential, overlapping or total channel measurements, including allocated sensor response time, such that the response time is verified. Allocations for sensor response times may be obtained from records of test results, vendor test data, or vendor engineering specifications. Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements," Reference 13, provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the Topical Report. Response time verification for other sensor types must be demonstrated by test. The allocation of sensor response times must be verified prior to placing a new component in operation and reverified after maintenance that may adversely affect the sensor response time. The replaced or repaired sensor must be tested to determine actual response time.

A Note is added to indicate that the neutron detectors are excluded from RPS RESPONSE TIME testing because they are passive devices with minimal drift and because of the difficulty of simulating a meaningful signal. Slow changes in leakage of neutrons with core burnup are compensated for by performing the daily calorimetric calibration (SR 3.3.1.4).

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BASES (continued)

REFERENCES

1. 10 CFR 20.

2. 10 CFR 100.

3. IEEE Standard 279-1971, April 5, 1972.

4. SONGS Units 2 and 3 UFSAR, Chapter 15.

5. 10 CFR 50.49.

6. PPS Setpoint Calculation CE-NPSD-570, Revision 3.

7. UFSAR, Section 7.2.

8. CEN-327, June 2, 1986, including Supplement 1, March 3, 1989.

9. RPS/ESFAS Extended Test Interval Evaluation for 120 Days Staggered Testing at SONGS Units 2 and 3, Calculation Number 09/010-AS93-C-002, November 1993.

10. Methodology for Developing Risk-Based Surveillance Programs for Safety-Related Equipment at San Onofre Nuclear Generating Station Units 2 and 3, PLG-0575, April 1992.

11. NRC Safety Evaluation Report for SONGS Unit 3 Operating License Amendment No. 142 dated February 12, 1999.

12. NRC Safety Evaluation Report for SONGS Unit 3 Operating License Amendment No. 136 dated November 23, 1998.

13. CEOG Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements."

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

functions, if applicable. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive surveillances. Measurement error determination, setpoint error determination, and calibration adjustment must be performed consistent with the plant specific setpoint analysis. The channel shall be left calibrated consistent with the assumptions of the current plant specific setpoint analysis. The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.

SR 3.3.5.6

This Surveillance ensures that the train actuation response times are within the maximum values assumed in the safety analyses.

Response time testing acceptance criteria are included in Reference 9.

Response time may be verified by any series of sequential, overlapping or total channel measurements, including allocated sensor response time, such that the response time is verified. Allocations for sensor response times may be obtained from records of test results, vendor test data, or vendor engineering specifications. Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements," Reference 12, provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the Topical Report. Response time verification for other sensor types must be demonstrated by test. The allocation of sensor response times must be verified prior to placing a new component in operation and reverified after maintenance that may adversely affect the sensor response time. The replaced or repaired sensor must be tested to determine actual response time.

ESF RESPONSE TIME tests are conducted on a STAGGERED TEST BASIS of once every 24 months. The 24 month Frequency is consistent with the typical industry refueling cycle and is

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BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

SR 3.3.5.7

SR 3.3.5.7 is a CHANNEL FUNCTIONAL TEST similar to SR 3.3.5.2 and SR 3.3.5.3, except SR 3.3.5.7 is performed within 120 days prior to startup and is only applicable to bypass functions. Since the Pressurizer Pressure – Low bypass is identical for both the RPS and ESFAS, this is the same Surveillance performed for the RPS in SR 3.3.1.13.

The CHANNEL FUNCTIONAL TEST for proper operation of the bypass permissives is critical during plant heatups because the bypasses may be in place prior to entering MODE 3 but must be removed at the appropriate points during plant startup to enable the ESFAS Function. Consequently, just prior to startup is the appropriate time to verify bypass function OPERABILITY. Once the bypasses are removed, the bypasses must not fail in such a way that the associated ESFAS Function is inappropriately bypassed. This feature is verified by SR 3.3.5.2. The allowance to conduct this test once within 120 days prior to each reactor startup is based on a plant specific report based on the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Refs. 8 and 10).

REFERENCES

1. SONGS Units 2 and 3 UFSAR, Section 7.3.
2. 10 CFR 50, Appendix A.
3. IEEE Standard 279-1971.
4. SONGS Units 2 and 3 UFSAR, Chapter 15.
5. 10 CFR 50.49.
6. PPS Setpoint Calculation CE-NPSD-570.
7. SONGS Units 2 and 3 UFSAR, Section 7.2.
8. CEN-327, May 1986, including Supplement 1, March 1989.

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BASES (continued)

REFERENCES (Continued)

9. Licensee Controlled Specification 3.3.10, "RPS/ESFAS Response Times."

10. RPS/ESFAS Extended Test Interval Evaluation for 120 Days Staggered Testing at SONGS Units 2 and 3, Calculation Number 09/010-AS93-C-002, November 1993.

11. Report NSG 98-007, "Time Limit for RAS or EFAS Channel in Trip," April 17, 1998.

12. CEOG Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements."

ATTACHMENT 4
SAN ONOFRE NUCLEAR GENERATING STATION
PCN-539

RETYPED TECHNICAL SPECIFICATION PAGES
AND BASES (for information only) PAGES

1.1 Definitions

CORE ALTERATION (continued)	within the reactor vessel with the vessel head removed and fuel in the vessel. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.
CORE OPERATING LIMITS REPORT (COLR)	The COLR is the unit specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific parameter limits shall be determined for each reload cycle in accordance with Specification 5.7.1.5. Plant operation within these limits is addressed in individual Specifications.
DOSE EQUIVALENT I-131	DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries/gram) that alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in ICRP-30, Supplement to Part 1, pages 192-212, Tables titled, "Committed Dose Equivalent in Target Organs or Tissues per Intake of Unit Activity."
$\bar{E}$ – AVERAGE DISINTEGRATION ENERGY	$\bar{E}$ shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration (in MeV) for isotopes, other than iodines, with half lives > 15 minutes, making up at least 95% of the total noniodine activity in the coolant.
ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME	The ESF RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays, where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of

(continued)

1.1 Definitions

ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME (Continued)	measurement, response time may be verified for selected components provided that the components and methodology for verification have been previously reviewed and approved by the NRC.
LEAKAGE	LEAKAGE shall be: a. Identified LEAKAGE 1. LEAKAGE, such as that from pump seals or valve packing (except reactor coolant pump (RCP) leakoff), that is captured and conducted to collection systems or a sump or collecting tank; 2. LEAKAGE into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be pressure boundary LEAKAGE; or 3. Reactor Coolant System (RCS) LEAKAGE through a steam generator (SG) to the Secondary System. b. Unidentified LEAKAGE All LEAKAGE that is not identified LEAKAGE. c. Pressure Boundary LEAKAGE LEAKAGE (except SG LEAKAGE) through a nonisolable fault in an RCS component body, pipe wall, or vessel wall.
MODE	A MODE shall correspond to any one inclusive combination of core reactivity condition, power level, average reactor coolant temperature, and reactor vessel head closure bolt tensioning specified in Table 1.1-1 with fuel in the reactor vessel.

(continued)

1.1 Definitions

OPERABLE – OPERABILITY	A system, subsystem, train, component, or device shall be OPERABLE when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).
PHYSICS TESTS	PHYSICS TESTS shall be those tests performed to measure the fundamental nuclear characteristics of the reactor core and related instrumentation. These tests are: a. Described in Chapter 14, Initial Test Program of the SONGS Units 2 and 3 UFSAR; b. Authorized under the provisions of 10 CFR 50.59; or c. Otherwise approved by the Nuclear Regulatory Commission.
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 3438 MWt.
REACTOR PROTECTIVE SYSTEM (RPS) RESPONSE TIME	The RPS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RPS trip setpoint at the channel sensor until electrical power to the CEAs drive mechanism is interrupted. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and methodology for verification have been previously reviewed and approved by the NRC.
SHUTDOWN MARGIN (SDM)	SDM shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming:

(continued)

1.1 Definitions

SHUTDOWN MARGIN (SDM) (continued)	a. All full length CEAs (shutdown and regulating) are fully inserted except for the single CEA of highest reactivity worth, which is assumed to be fully withdrawn. However, with all CEAs verified fully inserted by two independent means, it is not necessary to account for a stuck CEA in the SDM calculation. b. In MODES 1 and 2, the fuel and moderator temperatures are changed to the corrected hot zero power condition. c. There is no change in part length CEA position. With any CEAs not capable of being fully inserted, the reactivity worth of these CEAs must be accounted for in the determination of SDM.
STAGGERED TEST BASIS	A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function.
THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.13

This SR ensures that the RPS RESPONSE TIMES are verified to be less than or equal to the maximum values assumed in the safety analysis. Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor to the point at which the RTCBs open. Response times are conducted on an 24 month STAGGERED TEST BASIS. This results in the interval between successive surveillances of a given channel of n x 24 months, where n is the number of channels in the function. The Frequency of 24 months is based upon operating experience, which has shown that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences. Also, response times cannot be determined at power, since equipment operation is required.

Response time may be verified by any series of sequential, overlapping or total channel measurements, including allocated sensor response time, such that the response time is verified. Allocations for sensor response times may be obtained from records of test results, vendor test data, or vendor engineering specifications. Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements," Reference 13, provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the Topical Report. Response time verification for other sensor types must be demonstrated by test. The allocation of sensor response times must be verified prior to placing a new component in operation and reverified after maintenance that may adversely affect the sensor response time. The replaced or repaired sensor must be tested to determine actual response time.

A Note is added to indicate that the neutron detectors are excluded from RPS RESPONSE TIME testing because they are passive devices with minimal drift and because of the difficulty of simulating a meaningful signal. Slow changes in leakage of neutrons with core burnup are compensated for by performing the daily calorimetric calibration (SR 3.3.1.4).

(continued)

BASES (continued)

REFERENCES

1. 10 CFR 20.

2. 10 CFR 100.

3. IEEE Standard 279-1971, April 5, 1972.

4. SONGS Units 2 and 3 UFSAR, Chapter 15.

5. 10 CFR 50.49.

6. PPS Setpoint Calculation CE-NPSD-570, Revision 3.

7. UFSAR, Section 7.2.

8. CEN-327, June 2, 1986, including Supplement 1, March 3, 1989.

9. RPS/ESFAS Extended Test Interval Evaluation for 120 Days Staggered Testing at SONGS Units 2 and 3, Calculation Number 09/010-AS93-C-002, November 1993.

10. Methodology for Developing Risk-Based Surveillance Programs for Safety-Related Equipment at San Onofre Nuclear Generating Station Units 2 and 3, PLG-0575, April 1992.

11. NRC Safety Evaluation Report for SONGS Unit 2 Operating License Amendment No. 150 dated February 12, 1999.

12. NRC Safety Evaluation Report for SONGS Unit 2 Operating License Amendment No. 142 dated September 25, 1998.

13. CEOG Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements."

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

functions, if applicable. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive surveillances. Measurement error determination, setpoint error determination, and calibration adjustment must be performed consistent with the plant specific setpoint analysis. The channel shall be left calibrated consistent with the assumptions of the current plant specific setpoint analysis. The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.

SR 3.3.5.6

This Surveillance ensures that the train actuation response times are within the maximum values assumed in the safety analyses.

Response time testing acceptance criteria are included in Reference 9.

Response time may be verified by any series of sequential, overlapping or total channel measurements, including allocated sensor response time, such that the response time is verified. Allocations for sensor response times may be obtained from records of test results, vendor test data, or vendor engineering specifications. Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements," Reference 12, provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the Topical Report. Response time verification for other sensor types must be demonstrated by test. The allocation of sensor response times must be verified prior to placing a new component in operation and reverified after maintenance that may adversely affect the sensor response time. The replaced or repaired sensor must be tested to determine actual response time.

ESF RESPONSE TIME tests are conducted on a STAGGERED TEST BASIS of once every 24 months. The 24 month Frequency is consistent with the typical industry refueling cycle and is

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BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

based upon plant operating experience,which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

SR 3.3.5.7

SR 3.3.5.7 is a CHANNEL FUNCTIONAL TEST similar to SR 3.3.5.2 and SR 3.3.5.3, except SR 3.3.5.7 is performed within 120 days prior to startup and is only applicable to bypass functions. Since the Pressurizer Pressure – Low bypass is identical for both the RPS and ESFAS, this is the same Surveillance performed for the RPS in SR 3.3.1.13.

The CHANNEL FUNCTIONAL TEST for proper operation of the bypass permissives is critical during plant heatups because the bypasses may be in place prior to entering MODE 3 but must be removed at the appropriate points during plant startup to enable the ESFAS Function. Consequently, just prior to startup is the appropriate time to verify bypass function OPERABILITY. Once the bypasses are removed, the bypasses must not fail in such a way that the associated ESFAS Function is inappropriately bypassed. This feature is verified by SR 3.3.5.2. The allowance to conduct this test once within 120 days prior to each reactor startup is based on a plant specific report based on the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Refs. 8 and 10).

REFERENCES

1. SONGS Units 2 and 3 UFSAR, Section 7.3.
2. 10 CFR 50, Appendix A.
3. IEEE Standard 279-1971.
4. SONGS Units 2 and 3 UFSAR, Chapter 15.
5. 10 CFR 50.49.
6. PPS Setpoint Calculation CE-NPSD-570.
7. SONGS Units 2 and 3 UFSAR, Section 7.2.
8. CEN-327, May 1986, including Supplement 1, March 1989.

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BASES (continued)

REFERENCES (Continued)

9. Licensee Controlled Specification 3.3.100, "RPS/ESFAS Response Times."

10. RPS/ESFAS Extended Test Interval Evaluation for 120 Days Staggered Testing at SONGS Units 2 and 3, Calculation Number 09/010-AS93-C-002, November 1993.

11. Report NSG 98-007, "Time Limit for RAS or EFAS Channel in Trip," April 17, 1998.

12. CEOG Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements."

1.1 Definitions

CORE ALTERATION (continued)	within the reactor vessel with the vessel head removed and fuel in the vessel. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.
CORE OPERATING LIMITS REPORT (COLR)	The COLR is the unit specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific parameter limits shall be determined for each reload cycle in accordance with Specification 5.7.1.5. Plant operation within these limits is addressed in individual Specifications.
DOSE EQUIVALENT I-131	DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries/gram) that alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in ICRP-30, Supplement to Part 1, pages 192-212, Tables titled, "Committed Dose Equivalent in Target Organs or Tissues per Intake of Unit Activity."
$\bar{E}$ – AVERAGE DISINTEGRATION ENERGY	$\bar{E}$ shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration (in MeV) for isotopes, other than iodines, with half lives > 15 minutes, making up at least 95% of the total noniodine activity in the coolant.
ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME	The ESF RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF actuation setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays, where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of

(continued)

1.1 Definitions

ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME (Continued)	measurement, response time may be verified for selected components provided that the components and methodology for verification have been previously reviewed and approved by the NRC.
LEAKAGE	LEAKAGE shall be: a. Identified LEAKAGE 1. LEAKAGE, such as that from pump seals or valve packing (except reactor coolant pump (RCP) leakoff), that is captured and conducted to collection systems or a sump or collecting tank; 2. LEAKAGE into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be pressure boundary LEAKAGE; or 3. Reactor Coolant System (RCS) LEAKAGE through a steam generator (SG) to the Secondary System. b. Unidentified LEAKAGE All LEAKAGE that is not identified LEAKAGE. c. Pressure Boundary LEAKAGE LEAKAGE (except SG LEAKAGE) through a nonisolable fault in an RCS component body, pipe wall, or vessel wall.
MODE	A MODE shall correspond to any one inclusive combination of core reactivity condition, power level, average reactor coolant temperature, and reactor vessel head closure bolt tensioning specified in Table 1.1-1 with fuel in the reactor vessel.

(continued)

1.1 Definitions

OPERABLE – OPERABILITY	A system, subsystem, train, component, or device shall be OPERABLE when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).
PHYSICS TESTS	PHYSICS TESTS shall be those tests performed to measure the fundamental nuclear characteristics of the reactor core and related instrumentation. These tests are: a. Described in Chapter 14, Initial Test Program of the SONGS Units 2 and 3 UFSAR; b. Authorized under the provisions of 10 CFR 50.59; or c. Otherwise approved by the Nuclear Regulatory Commission.
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 3438 MWt.
REACTOR PROTECTIVE SYSTEM (RPS) RESPONSE TIME	The RPS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RPS trip setpoint at the channel sensor until electrical power to the CEAs drive mechanism is interrupted. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and methodology for verification have been previously reviewed and approved by the NRC.
SHUTDOWN MARGIN (SDM)	SDM shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming:

(continued)

1.1 Definitions

SHUTDOWN MARGIN (SDM) (continued)	a. All full length CEAs (shutdown and regulating) are fully inserted except for the single CEA of highest reactivity worth, which is assumed to be fully withdrawn. However, with all CEAs verified fully inserted by two independent means, it is not necessary to account for a stuck CEA in the SDM calculation. b. In MODES 1 and 2, the fuel and moderator temperatures are changed to the corrected hot zero power condition. c. There is no change in part length CEA position. With any CEAs not capable of being fully inserted, the reactivity worth of these CEAs must be accounted for in the determination of SDM.
STAGGERED TEST BASIS	A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function.
THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.13

This SR ensures that the RPS RESPONSE TIMES are verified to be less than or equal to the maximum values assumed in the safety analysis. Individual component response times are not modeled in the analyses. The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor to the point at which the RTCBs open. Response times are conducted on an 24 month STAGGERED TEST BASIS. This results in the interval between successive surveillances of a given channel of n x 24 months, where n is the number of channels in the function. The Frequency of 24 months is based upon operating experience, which has shown that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences. Also, response times cannot be determined at power, since equipment operation is required.

Response time may be verified by any series of sequential, overlapping or total channel measurements, including allocated sensor response time, such that the response time is verified. Allocations for sensor response times may be obtained from records of test results, vendor test data, or vendor engineering specifications. Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements," Reference 13, provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the Topical Report. Response time verification for other sensor types must be demonstrated by test. The allocation of sensor response times must be verified prior to placing a new component in operation and reverified after maintenance that may adversely affect the sensor response time. The replaced or repaired sensor must be tested to determine actual response time.

A Note is added to indicate that the neutron detectors are excluded from RPS RESPONSE TIME testing because they are passive devices with minimal drift and because of the difficulty of simulating a meaningful signal. Slow changes in leakage of neutrons with core burnup are compensated for by performing the daily calorimetric calibration (SR 3.3.1.4).

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BASES (continued)

REFERENCES

1. 10 CFR 20.

2. 10 CFR 100.

3. IEEE Standard 279-1971, April 5, 1972.

4. SONGS Units 2 and 3 UFSAR, Chapter 15.

5. 10 CFR 50.49.

6. PPS Setpoint Calculation CE-NPSD-570, Revision 3.

7. UFSAR, Section 7.2.

8. CEN-327, June 2, 1986, including Supplement 1, March 3, 1989.

9. RPS/ESFAS Extended Test Interval Evaluation for 120 Days Staggered Testing at SONGS Units 2 and 3, Calculation Number 09/010-AS93-C-002, November 1993.

10. Methodology for Developing Risk-Based Surveillance Programs for Safety-Related Equipment at San Onofre Nuclear Generating Station Units 2 and 3, PLG-0575, April 1992.

11. NRC Safety Evaluation Report for SONGS Unit 3 Operating License Amendment No. 142 dated February 12, 1999.

12. NRC Safety Evaluation Report for SONGS Unit 3 Operating License Amendment No. 136 dated November 23, 1998.

13. CEOG Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements."

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

functions, if applicable. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive surveillances. Measurement error determination, setpoint error determination, and calibration adjustment must be performed consistent with the plant specific setpoint analysis. The channel shall be left calibrated consistent with the assumptions of the current plant specific setpoint analysis. The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.

SR 3.3.5.6

This Surveillance ensures that the train actuation response times are within the maximum values assumed in the safety analyses.

Response time testing acceptance criteria are included in Reference 9.

Response time may be verified by any series of sequential, overlapping or total channel measurements, including allocated sensor response time, such that the response time is verified. Allocations for sensor response times may be obtained from records of test results, vendor test data, or vendor engineering specifications. Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements," Reference 12, provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the Topical Report. Response time verification for other sensor types must be demonstrated by test. The allocation of sensor response times must be verified prior to placing a new component in operation and reverified after maintenance that may adversely affect the sensor response time. The replaced or repaired sensor must be tested to determine actual response time.

ESF RESPONSE TIME tests are conducted on a STAGGERED TEST BASIS of once every 24 months. The 24 month Frequency is consistent with the typical industry refueling cycle and is

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)

based upon plant operating experience, which shows that random failures of instrumentation components causing serious response time degradation, but not channel failure, are infrequent occurrences.

SR 3.3.5.7

SR 3.3.5.7 is a CHANNEL FUNCTIONAL TEST similar to SR 3.3.5.2 and SR 3.3.5.3, except SR 3.3.5.7 is performed within 120 days prior to startup and is only applicable to bypass functions. Since the Pressurizer Pressure – Low bypass is identical for both the RPS and ESFAS, this is the same Surveillance performed for the RPS in SR 3.3.1.13.

The CHANNEL FUNCTIONAL TEST for proper operation of the bypass permissives is critical during plant heatups because the bypasses may be in place prior to entering MODE 3 but must be removed at the appropriate points during plant startup to enable the ESFAS Function. Consequently, just prior to startup is the appropriate time to verify bypass function OPERABILITY. Once the bypasses are removed, the bypasses must not fail in such a way that the associated ESFAS Function is inappropriately bypassed. This feature is verified by SR 3.3.5.2. The allowance to conduct this test once within 120 days prior to each reactor startup is based on a plant specific report based on the reliability analysis presented in topical report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation" (Refs. 8 and 10).

REFERENCES

1. SONGS Units 2 and 3 UFSAR, Section 7.3.
2. 10 CFR 50, Appendix A.
3. IEEE Standard 279-1971.
4. SONGS Units 2 and 3 UFSAR, Chapter 15.
5. 10 CFR 50.49.
6. PPS Setpoint Calculation CE-NPSD-570.
7. SONGS Units 2 and 3 UFSAR, Section 7.2.
8. CEN-327, May 1986, including Supplement 1, March 1989.

(continued)

BASES (continued)

REFERENCES (Continued)

9. Licensee Controlled Specification 3.3.10, "RPS/ESFAS Response Times."

10. RPS/ESFAS Extended Test Interval Evaluation for 120 Days Staggered Testing at SONGS Units 2 and 3, Calculation Number 09/010-AS93-C-002, November 1993.

11. Report NSG 98-007, "Time Limit for RAS or EFAS Channel in Trip," April 17, 1998.

12. CEOG Topical Report CE NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements."