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Mr. William H. Bateman
Director, Directorate IV - II
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Gentlemen:

Subject: **Docket No. 50-362**
Request for Enforcement Discretion
Engineered Safety Features Response Time Testing
San Onofre Nuclear Generating Station
Units 2 and 3

Dear Mr. Bateman:

The purpose of this letter is to provide written followup to a request for discretionary enforcement from the requirements of Surveillance Requirement (SR) 3.3.5.6 of Technical Specification (TS) 3.3.5, "Engineered Safety Features Actuation System (ESFAS) Instrumentation." This enforcement discretion is requested for San Onofre Unit 3 (1) until February 22, 1997 to permit testing of approximately 48 subgroup relays, and (2) until the NRC approves, on an exigent basis, a license amendment which will defer implementation of SR 3.3.5.6 until the next refueling outage for approximately 30 subgroup relays. This request was discussed with the NRC in a telephone call on the morning of February 15 and verbally granted at 12:43 p.m. PST.

The need for this request results from an interpretation of what was required to satisfy this SR. This SR was believed to be satisfied by a surveillance which included a bounding response time allowance for the subgroup relays, in lieu of actually time testing these relays every 24 months on a staggered test basis.

On February 14, 1997, Southern California Edison (Edison) recognized that the existing Unit 3 surveillances of record did not fully satisfy SR 3.3.5.6. The SR requires verification that the ESF Response Time is within limits, which requires that the response time of the subgroup relays be measured. The subgroup relays not yet tested to fully satisfy SR 3.3 5.6 that can reasonably be tested with the plant in Mode 1 (approximately 48 relays) will be tested to fully satisfy SR 3.3.5.6 by February 22, 1997. Although it may be possible to perform this test with the Unit in Mode 1 for the remaining approximately 30 subgroup relays, it would involve testing these relays inside the ESF cabinets using temporary jumpers and power supplies for safety significant components (main steam isolation valves, feedwater valves, reactor coolant pump bleedoff, instrument air, and component cooling water), as well as defeating the safety function of these relays during testing. Performance of this testing in

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Mode 1 would involve more risk of inadvertent actuation of ESF equipment and trip of the Unit.

After reviewing existing documentation, however, Edison believes that the subgroup relays are fully functional and capable of performing their intended safety functions, as demonstrated by satisfactory performance during other surveillance testing, the margin available for relay operation, and the recent maintenance history of the relays. Granting this request for enforcement discretion would avoid an undesirable transient associated with an unnecessary plant shutdown or online testing and thus minimize potential safety consequences and operational risks associated with such action.

A. Requirements For Which The Notice of Enforcement Discretion Is Requested

The following surveillance requirement applies:

SR 3.3.5.6

Verify ESF RESPONSE TIME is within limits.

ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME (Definition)

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.

B. Circumstances Surrounding the Situation:

Unit 2 is currently in a refueling outage, and Unit 3 is operating at full power. In response to a recent unrelated, but similar, problem with SR 3.8.1.9, Edison was in the process of reviewing other surveillances to ensure full compliance with the TSs. During this review, and as noted above, on February 14, 1997, Edison recognized that the existing surveillances of record did not fully satisfy SR 3.3.5.6 requirements.

This is considered to have been caused by an interpretation of what was required to satisfy this requirement in the 1983 timeframe. A bounding time response allowance for these relays was developed based on onsite, in-place relay measurements in 1983. Edison engineers concluded this bounding time response allowance was an acceptable approach to satisfy the surveillance requirement in lieu of actually testing the relays.

The definition of ESF Response Time in the original Technical Specifications didn't include the sentence that the response time of every component in the ESF be "measured". However, the original Technical Specification Basis did indicate:

"Response time may be demonstrated by any series of sequential, overlapping or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either 1) in place, onsite or offsite test measurements or 2) utilizing replacement sensors with certified response times."

The bounding time utilized for the actuation relays was established as part of extensive onsite response time testing performed on in-place relays in 1983. Since the definition of ESF Response Time didn't specifically require that the entire response time be "measured" and the basis provides for the use of test measurements, the bounding time was incorporated into site test procedures. It was also established that the use of the bounding time would still maintain a conservative posture relative to the overall response time assuming the actuation relays are verified to be operable by performance of channel functional testing, channel calibration testing and subgroup actuation relay testing, including actuation of affected components.

However, when this approach was compared to the words in the TS definition, it was concluded it did not strictly satisfy the requirements of the SR, therefore Edison was not able to conclude the tests of record fully complied with the surveillance requirements. As such, Edison declared a missed surveillance on ESF Response Time testing for Unit 3, and entered the provisions of SR 3.0.3 at 1:00 pm on February 14, 1997.

C. Compensatory Measures:

The satisfactory performance of other surveillance testing, the available margin for relay operation, and the maintenance history of the subgroup relays provides adequate assurance that the relays are fully capable of performing their intended safety functions. Consequently, Edison does not consider any compensatory actions, beyond this request for enforcement discretion and an exigent change to the TS, are warranted. A copy of the proposed change to the TS that will be submitted on an exigent basis is enclosed.

Additionally, for Unit 2, the response time of the subgroup relays will be verified in accordance with this SR prior to return to Mode 4 from the current refueling outage. Moreover, in the event of a planned or unplanned shutdown of Unit 3 prior to the Cycle 9 refueling outage, testing in accordance with the SR will be performed prior to increasing in Modes from that shutdown. For the long-term, this response time testing will continue to be done during future outages as specified in the Technical Specifications.

D. Safety Basis For This Request:

1. Description

The subgroup relays are part of the ESF systems. The safety-related instrumentation and controls of the ESF systems include the ESFAS

which consists of the electrical and mechanical devices and circuitry (from sensors to actuation device input terminals) involved in generating those signals that actuate the required ESF systems, and the arrangement of components that perform protective actions after receiving a signal from either the ESFAS or the operator.

The ESFAS includes sensors to monitor selected safety significant parameters. The following actuation signals are generated by the ESFAS when the monitored variables reach the levels that are indicative of conditions which require protective action:

- Safety Injection System
- Recirculation (Containment Emergency Sump)
- Containment Spray
- Containment Isolation
- Emergency Feedwater
- Containment Cooling

The signals from the ESFAS actuate the ESF equipment. For the above actuation systems, two-out-of-four coincidence of like initiating trip signals from four independent measurement channels is required to actuate the ESF system.

The response time of the ESF systems may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. At San Onofre the total response time has been determined by sequentially adding the response times determined for separate segments of the ESF systems. Response times have been measured during each surveillance from the sensor/transmitter to the subgroup relay and from the subgroup relay until the ESF equipment is capable of performing its safety function. However, instead of being measured during each surveillance, a bounding time response allowance was used for the subgroup relays based on measurements and an engineering evaluation performed in 1983. The bounding time was based on testing completed from a large sample of relays tabulated by relay type. Three standard deviations were applied to the average of the relay times and the result was conservatively rounded up to 0.300 seconds.

Subgroup Relays

The subgroup relays are Potter & Brumfield Motor Driven Relays. These relays utilize a coil to rotate a shaft which causes the contacts to open and close. Although earlier versions of these relays have had a history of performance problems, these issues have been addressed and resolved as discussed below.

During a Unit 2 integrated ESF test in November, 1987, one subgroup relay did not function properly. Examination of the relay revealed the presence of contamination and corrosion products. These materials were present on and around the bearing surfaces and in bushing to

shaft spaces where it was quite plausible that such a buildup of material could cause the relay to mechanically jam.

The failure mode was found to be predominately one of relay binding due to "out-gassing" of organic material in the insulating varnish of the relay coil. The out-gassed material would condense on the internal surfaces of the relay, such as the shaft and shaft bearing surface, causing binding. The primary driving force for the problem was excess heat (temperature) generated by coil voltages 10% or more above nominal operating voltage.

Edison and other utilities worked with Potter & Brumfield to correct all the problems experienced. The changes included using an epoxy coil coating instead of varnish, addition of a lubricant to increase shaft rotational life, dimensional changes to alleviate shaft binding, and replacement of materials for PVC insulating sleeves and neoprene grommets in the motor base.

Revision controlled drawings were instituted with the vendor guaranteeing no changes to subgroup relays purchased by San Onofre without Edison approval. Unique part numbers were assigned to further track changes and subsequent replacement of existing subgroup relays. On-site Quality Control inspection and testing was used to "qualify" the vendor for the new design subgroup relays.

The subgroup relays in ESF systems with varnish coils were replaced in the 1989 to 1993 time frame.

2. Justification for Enforcement Discretion

Edison has completed a number of activities including 1) an assessment of the total time sequence for the individual ESF subgroup relays, 2) initial Unit 2 relay testing, 3) a maintenance history search for relay reliability, and 4) an evaluation of recent channel test results.

The enclosed tables provide the individual relay and component timing data for both Units 2 and 3 Trains A and B ESF equipment. The information in the tables was pulled from plant records during the 24-hour period of the missed surveillance and is the best available information. The tables list the individual relays, the associated valve or pump that is actuated, timing data for the trains, the technical specification limit for the component, and allowable "margin" to the limit. Note that the table shows a "zero" time for the subgroup relays. This "zero" time is shown so that the allowable margin column effectively shows the time available to accommodate the actual response time for these relays.

As shown in the enclosed tables, there are 112 subgroup relays in the ESF relay cabinets. Edison has further evaluated each relay and actuated component. Of these 112 relays, 85 are required to be response time tested to comply with SR 3.3.5.6. As a result of the

integrated ESF testing, response time data is available for 8 of these relays. Of the remaining 77 relays, approximately 48 can be response time tested on line. The remaining approximately 30 relays cannot be response time tested on-line without rendering their associated equipment inoperable and incapable of performing their safety functions. These relays close valves that are required to be open while the plant is operating in systems such as main steam isolation, main feedwater, reactor coolant pump bleedoff, component cooling water noncritical loop, and instrument air.

In response to this missed surveillance, Edison placed a Mode 4 restraint on the Unit 2 refueling outage, and immediately initiated a complete retest of all the ESF subgroup relays addressed by SR 3.3.5.6. Additionally, response time testing was initiated on the Unit 3 relays that can be tested on-line. Currently, response time data collected on subgroup relays tested on Unit 2 shows time responses in the range of 0.035 seconds to 0.119 seconds. This testing includes a sample of over 60 relays. Response time data collected on Unit 3 subgroup relays (currently 11 of 48 relays are complete) shows time response in the range of 0.037 seconds to 0.115 seconds. These results are an improvement over data obtained in 1983 for the previous version subgroup relays and support the bounding time response allowance of 0.300 seconds used for the subgroup relays.

A maintenance history search for ESF subgroup relay failures was completed. This search found no failure on either San Onofre unit since the 1989-1993 time period after the relays were replaced.

In addition, all ESF trains have successfully passed the following surveillance tests:

1. Channel Functional Test (SR 3.3.5.2, SR 3.3.5.3, SR 3.3.5.7, SR 3.3.6.1, and SR 3.3.6.3)

2. Channel Calibration Test (SR 3.3.5.4 and SR 3.3.5.5)

3. Subgroup Relay Test (SR 3.3.6.2)

The ESF trains have satisfied the above surveillance test acceptance criteria, which provides assurance that the ESF trains are operable.

In summary, Edison is confident that the Unit 3 ESF trains remain operable and that the time response of the subgroup relays is within the assumed allowance of 0.300 seconds because:

1. There is sufficient available margin for subgroup relays that are not currently timed (see enclosed tables),

2. Results of Unit 2 subgroup relay testing conducted on February 14 and 15, 1997 demonstrated that the timing of the subgroup relays was consistent with and bounded by the 1983 assessment,

3. There is no history of ESF subgroup relay failure since the 1989-1993 time period.

4. Surveillance requirements for ESF Channel Functional Tests, ESF Channel Calibration Tests, and ESF Subgroup Relay Tests have been successful.

In addition, based on the current tests of record for the Unit 3 integrated ESF test per SR 3.8.1.19, 8 subgroup relays plus actuated components, were demonstrated to be within their overall response time requirement.

3. Probabilistic Risk Assessment

The core damage and significant radioactive release risk impact of continued Unit 3 operation without performing the subject ESF surveillance testing has been determined negligible. Since the engineering assessment concludes that the overall ESF response time remains within allowable design margins, no events modeled in the San Onofre Units 2 and 3 living probabilistic risk assessment are impacted. The impact on core damage risk from a forced unit shutdown to perform the subject surveillance test is estimated to be 1E-6, which is non-negligible. Therefore, the safest course of action is to remain at power and conduct the surveillance testing during the next outage.

E. Justification for the Duration of the Enforcement Discretion:

Enforcement discretion is requested (1) until February 22, 1997 to permit testing of approximately 49 subgroup relays, and (2) until the NRC approves on an exigent basis a license amendment which will defer implementation of SR 3.3.5.6 until the next refueling outage on Unit 3 for approximately 29 subgroup relays. This request will preclude the need to shut down Unit 3 before the refueling outage for the sole purpose of performing this SR. The start of the Unit 3 cycle 9 refueling outage is currently anticipated for April 12, 1997.

F. Basis for No Significant Hazards Conclusion:

10 CFR 50.92 defines that no significant hazards will occur if operation of the facility, in accordance with the enforcement discretion, does not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated; or

2. Create the possibility of a new or different kind of accident from any accident previously evaluated; or

3. Involve a significant reduction in a margin of safety.

Based on other surveillance testing, the margin available for the subgroup relays, results of testing on Unit 2 relays, and the history of no

failures since the 1989 to 1993 time period, Edison concludes the subgroup relays have demonstrated their capability to perform their specified safety function. Consequently, Edison does not consider this enforcement discretion to involve a potential detriment to the public health and safety, and that neither an unreviewed safety question nor a significant hazard is involved.

G. Basis for No Irreversible Environmental Consequences:

As this activity is confined to site boundaries, this request for an NRC notice of enforcement discretion involves no increase in the amounts, and no change in the types of any effluent that may be released offsite. There is also no increase in individual or cumulative occupational radiation exposure involved with this enforcement discretion. Accordingly, this temporary enforcement discretion meets the eligibility criteria for categorical exclusion set forth in 10 CFR Section 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the granting of the notice of enforcement discretion.

H. Technical Specification Implementation Issues at San Onofre

This discussion addresses the background of Edison's implementation of the new Technical Specifications (TS), initiation of a detailed surveillance review program, and why this request for discretionary enforcement was unavoidable.

1. TSIP Implementation Program

In August, 1986 San Onofre volunteered to be the lead Combustion Engineering plant for implementation of the Technical Specification Improvement Program (TSIP). This was in accordance with a strong desire on the part of the NRC to standardize and improve TS. NUREG-1432, "Standard Technical Specifications--Combustion Engineering Reactors" was developed over the next several years by the NRC, Combustion Engineering, and the industry and included significant support from Edison.

On August 10, 1995 a draft version of the new San Onofre TS was issued with a one year implementation period. From August to November, 1995, SCE continued to review and comment on the new TS and the draft Bases to support the final revision which was issued on February 9, 1996. In November, 1995 a multi-disciplinary implementation team was formed to ensure the TSIP changes were properly implemented in our procedures. Each organization had responsibility for changing the procedures in their area. Over 900 procedures were identified for change. About 50% of these changes were purely administrative in nature (such as changing of the TS numbering system). The other 50% involved technical changes to the procedures. From the onset, the understanding was that there were only a few new requirements and in general the requirements were either unchanged or were relaxed. Changes that were identified as more restrictive were evaluated and

reviewed in detail to ensure they were properly implemented. For all other TS changes, procedural changes were made to reflect the fact that the change had occurred but no overall technical review of the adequacy of previous procedural implementation was performed.

In the process of implementing the new TS a number of issues were raised. Some had to do with wording in the Bases. Others were related to requirements that could not be met by our plant. Still others were related to the adequacy of implementation in existing procedures. Two such issues resulted in TS amendments being issued. On December 3, 1996, the NRC issued the second of these amendments and requested an analysis of the errors that led to the need for changes and what measures should be established to prevent reoccurrence of errors in the future. These errors were associated with the preparation and review of the TS requirements and not specifically with the implementation of the requirements. As such, these errors did not trigger the need for further review of the implementation process.

Prior to TSIP implementation on August 5, 1996, all TS surveillance requirements were checked to ensure a procedure existed that addressed that requirement. It was not considered necessary at that time to perform an overall technical assessment of the adequacy of the procedural implementation. The review focused on ensuring the TS requirement was captured in a procedure. TS requirements identified as being more restrictive were identified and surveillances were performed prior to the implementation date to ensure compliance with the new surveillance requirement at the moment of implementation. Administrative changes and less restrictive requirements were assumed to be bounded by surveillances performed under the old TS.

2. Initiation of Detailed Surveillance Review Program

On December 16, 1996, an engineer reviewing SR 3.8.1.13 noted the TS requirement was not properly implemented in the surveillance procedure. SCE concluded that the procedure failed to meet the equivalent surveillance requirement in the old TS as well, stemming from an error in 1983. The TSIP review identified this issue in May, 1996 but it was incorrectly concluded that the surveillance met the TS requirement and so an administrative TS change to improve the wording would be sufficient. However, when the issue resurfaced in December, 1996 SCE concluded that the surveillance requirement had not been met. Because this was a previously existing condition unrelated to TSIP, it was not concluded at that time that a wider TS review was required. Further review of the Emergency Diesel Generator refueling surveillances was conducted in connection with performance of these surveillances during the Unit 2 refueling outage. On January 11, 1997 SCE determined that the surveillance tests of record did not demonstrate compliance with SR 3.8.1.14 and SR 3.8.1.15. Edison requested and the NRC granted discretionary enforcement to allow SONGS 3 to remain at power. On January 13, 1997 Edison engineers concluded

that SR 3.8.1.9c was not met. These two cases were the direct result of changes in the TS wording as a result of TSIP.

As a result of these issues related to TS surveillance implementation, Edison assembled a team of 30 people on January 13, 1997 to review TS surveillance implementation. This team was required to review every TS surveillance requirement, word-by-word, and ensure that the specified requirements were properly implemented by a detailed review of the specific procedural steps that accomplished the requirements. This detailed review identified a large number of potential issues related to surveillances. A total of 232 Action Requests have been generated to date. Most of these items related to procedural improvements, TS Bases improvements, or LCS changes needed. A small number of issues were identified as TS surveillance requirements that were not met and the appropriate action statements were entered. These were identified to the NRC in LER 97-001 on February 4, 1997. On February 4, 1997 Edison identified a failure to properly perform a Channel Functional Test of the Control Element Assembly Reed Switch Position Transmitters. Edison requested and the NRC granted discretionary enforcement for continued operation of SONGS 3. Since then, issues related to Loss of Voltage relay time response, reactor head vent system flow verification, and time response testing of subgroup relays have been identified. The subgroup relay issue is the subject of this written request for enforcement discretion.

The TS surveillance review team has a total of 649 review packages. About 600 of these have been completed through the first reviewer and over 500 are complete through the second review. The team will complete all first and second level reviews by February 21, 1997. San Onofre Unit 2 will not be brought back on line until the second level review is complete. By February 28, 1997 the team is scheduled to complete its review of interdivisional surveillance continuity to be sure there are no gaps between different divisions completing separate surveillance requirements.

3. Why This Discretionary Enforcement Was Unavoidable

The NRC Inspection Manual governing the granting of enforcement discretion indicates that to prevent the potential for abuse the NRC will verify that "the emergency condition is unavoidable". Therefore it is important to understand the problems that have been identified and why the situation was unavoidable. All of the problems identified to date were related to one of two conditions. The first condition included those unrelated to TSIP. These problems were related to misinterpretations of unclear requirements in the original TS. One of the stated goals of TSIP was to clarify those requirements. Once implemented in our surveillance programs, these problems continued until the present time and it was the recent detailed review that identified them. The condition of failure to meet the SR was unavoidable from the time when they were incorporated into our programs. A detailed review of all surveillance requirements prior to

implementation of TSIP would not have avoided the condition but would only have identified it sooner.

The second set of problems was associated with the implementation of TSIP. These were related to the belief that the surveillances in question were either unchanged or relaxed and hence did not require surveillance changes or reperformance of surveillances prior to implementation of TSIP. Again, the problems were uncovered by the detailed review of TS surveillances begun in January, 1997. As an example, the subgroup relay problem which was identified during this review is a case where it was clearly expected that no change in requirement had taken place. Edison had identified the definition change as editorial and the NRC Safety Evaluation Report noted that the new definitions "do not change the intent of the definitions as found in NUREG-1432 and in the existing SONGS TS." However, it was this definition change that flagged this issue during the detailed review. The fact that several errors have been recently identified is a direct result of the decision to perform the extensive TS surveillance review. It is not the result of a failure to properly respond to previously identified problems.

The NRC Inspection Manual states that the NRC will verify "the emergency condition is unavoidable." Edison believes that this latest February 14 request for enforcement discretion associated with TSIP was unavoidable. The enforcement discretion process clearly should not be abused with multiple requests from the licensee when corrective actions could have been implemented to prevent a repeated request. For example, if a licensee misses a surveillance due to poor planning, it would be expected that the licensee improve their planning process to prevent a re-occurrence. Therefore, a second enforcement discretion request, and certainly a third enforcement discretion request, would require careful regulatory scrutiny to justify why these additional requests were unavoidable. This is not the case with the recent surveillance issues at San Onofre Units 2 and 3. All the issues identified occurred prior to the formation of the TS surveillance review team and could not have been avoided on the basis of lessons learned by this team. The identification of 1983 era errors is the direct result of reviewing the surveillance assumptions with 1997 vision. The TSIP implementation errors are a direct result of being the lead TSIP utility and the assumption that administrative changes or requirement relaxation precluded the need for a detailed surveillance review. The ongoing nature of surfacing of surveillance issues is the direct result of the aggressive approach of the surveillance review team to question every assumption and to immediately flag any potential issue. Edison was unable to avoid the requests for enforcement discretion in that the missed surveillance conditions existed prior to January 1997 which precluded Edison from taking corrective actions which could make the requests unavoidable.

The San Onofre Nuclear Generating Station Onsite Review Committee reviewed and approved this request for an NRC notice of enforcement discretion.

If you have any questions or comments, or if you would like additional information, please let me know.

Sincerely,

R W Krieger

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