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REGION V SAN ONOFRE NUCLEAR GENERATING STATION

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October 26, 1991

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Mr. John B. Martin
Regional Administrator
U. S. Nuclear Regulatory Commission, Region V
1450 Maria Lane, Suite 210
Walnut Creek, California 94596

Subject: Docket Nos. 50-206 and 50-362
Request for Temporary Waiver of Compliance
Reactor Coolant Pump Flywheel Inspection
San Onofre Nuclear Generating Station, Units 1 and 3

Reference: Regulatory Guide 1.14, "Reactor Coolant Pump
Flywheel Integrity," Revision 1, August 1975

The purpose of this letter is to document the basis for a request for temporary waiver of compliance from the requirements of Technical Specification (TS) Limiting Conditions for Operation (LCO) 3.0.3 (Units 1 and 3), 3.1.2 (Unit 1), and 3.4.1.1 (Unit 3) until December 1, 1991. These LCOs relate to the failure to meet the conditions of an LCO, "Reactor Coolant System - Operational Components," and "Reactor Coolant System - Reactor Coolant Loops and Coolant Circulation, Startup and Power Operation," respectively. Verbal approval of this request was granted for a period not to exceed 5 days at approximately 1550 PDT by the NRC in a telephone discussion with the undersigned on October 25, 1991. Approval of this temporary waiver was granted to avoid the immediate shutdown of Units 1 and 3 and to allow sufficient time to evaluate the potential impact of exceeding the inspection interval associated with reactor coolant pump motor flywheels in accordance with TS Surveillance Requirements 4.7 (Unit 1) and 4.4.9 (Unit 3).

A. Requirements for Which the Temporary Waiver is Requested

Unit 1

TS Surveillance Requirement 4.7, "Inservice Inspection Requirements," establishes the structural integrity surveillance requirements associated with ASME Class 1, 2,

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and 3 pressure retaining components and their supports. Although not explicitly referenced in TS 4.7, included in the Inservice Inspection (ISI) program (as indicated in Final Safety Analysis Report Section 5.2.6, "Reactor Coolant Pump (RCP) Motor Flywheel") is a requirement to inspect each RCP flywheel in accordance with Regulatory Guide 1.14. Regulatory Guide 1.14, "Reactor Coolant Pump Flywheel Integrity," Revision 1, August 1975, Position C.4.b(1) requires that at approximately 3 year intervals, during the refueling or maintenance shutdown coinciding with the ISI schedule, an in-place ultrasonic volumetric examination of the areas of higher stress concentration at the bore and keyway be performed.

On October 25, 1991, at approximately 0930, it was identified that the flywheel inspections for RCPs B and C were last performed in December 1985. The flywheel inspection for RCP A was performed in 1988 (The motor for RCP A was disassembled for an unrelated maintenance activity, affording an opportunity to perform a complete surface examination and ultrasonic volumetric examination). Since the inspection interval substantially exceeded 3 years for RCPs B and C, SCE concluded that the requirements of TS 4.7 had not been satisfied. Since the TSS do not specifically address the operability requirements for RCP motor flywheels, TS 3.0.3 was considered to be applicable. In addition, since the structural integrity of the motor flywheel affects the operation of the RCPs, TS 3.1.2 "Reactor Coolant System - Operational Components" was also considered to apply in this case. TS 3.1.2 Part C, requires that all 3 RCP reactor coolant loops, steam generators, and RCPs be in operation. With less than 3 loops in operation, it is necessary for the plant to be placed in Mode 3 within one hour. Although all RCPs remained in operation, each RCP must fully satisfy all surveillance requirements to be considered operable.

Shutdown of Unit 1 in accordance with the Action requirements of TS 3.0.3 and 3.1.2 was delayed for a period not to exceed 24 hours, as allowed by TS 4.0.3 (which permits such a delay to allow completion of the surveillances or other remedial measures).

Unit 3

TS 3.4.9, "Reactor Coolant System - Structural Integrity," establishes the structural integrity surveillance requirements of ASME Code Class 1, 2, and 3 components. Associated TS surveillance requirement 4.4.9 establishes the Regulatory Guide 1.14 RCP motor flywheel inspection requirements as described above for Unit 1. The inspections

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of Unit 3 RCP flywheels are normally scheduled to be performed at every other refueling outage.

On October 24, 1991, at approximately 1700, it was identified that the flywheel inspections for the Unit 3 RCPs were last performed in February 1987. Since the inspection interval substantially exceeded 3 years, the surveillance interval as defined by TS 4.4.9 and Regulatory Guide 1.14 was considered to have been exceeded. As described above (for Unit 1) TS 3.0.3 was considered to be applicable. In addition, TS 3.4.1.1 requires that in Modes 1 and 2 both reactor coolant loops and both RCPs in each loop shall be in operation. Within one hour, the plant must be placed in Mode 3 if fewer than 4 RCPs are in operation. As indicated in the above discussion concerning Unit 1, the structural integrity of the flywheel affects the operation of the RCP; therefore the Action requirement of TS 3.4.1.1 was also considered to apply.

Shutdown in accordance with TS 3.0.3 and 3.4.1.1 was delayed for a period not to exceed 24 hours as allowed by TS 4.0.3.

In summary, this letter documents the request for a temporary waiver of compliance from the Action requirements of TS 3.0.3 (Unit 1 and 3), 3.1.2 (Unit 1), and 3.4.1.1 (Unit 3) to avoid the unnecessary shutdown of each unit, until December 1, 1991. As discussed above, the NRC has granted approval of this temporary waiver for a period not to exceed 5 days to allow sufficient time to further evaluate the potential impact of exceeding the RCP motor flywheel inspection interval.

B. Circumstances Surrounding the Situation

The examination scheduling deficiencies prompting the need for the temporary waiver were discovered during a Quality Assurance audit of the ISI program at San Onofre. Our preliminary evaluation of this issue has identified a weakness in the tracking of the flywheel inspection surveillance for Unit 1, in that the requirement was embodied in the ASME Section XI ISI surveillance program, which allows for interval extensions that can not be applied to the flywheel inspection. The Unit 3 inspection was exceeded as a result of an apparent scheduling oversight.

C. Compensatory Actions Necessary

The surveillance interval of approximately 3 years is based upon the ability to detect a flaw before the flaw could propagate and cause catastrophic flywheel failure. There are several postulated sequences leading up to a flywheel

failure which could occur. It is possible that a crack would manifest itself in flywheel imbalance and resultant changes in motor/pump vibration signatures. While SCE believes that a sudden failure is a less likely scenario, a review of the flywheel design is ongoing. As such, the following compensatory actions will be in effect for the duration of the temporary waiver.

1. Baseline vibration data for each pump will be established based upon the vibration history during the past six months. This will be accomplished by 1600 on October 27, 1991. If the amplitude of the vibration increases to 3 mils or greater above the established baseline, an engineering evaluation of the condition will be initiated and the NRC Resident Inspectors will be notified within 24 hours. If the vibration increases to 6 mils or greater above the established baseline, shutdown of the affected unit will be initiated in accordance with the Action requirements of TS 3.0.3 to an operating mode which permits the affected RCP to be secured. The vibration levels will be monitored once per day.
2. Each RCP is provided with 2 vibration probes. If both probes on any affected pump fail, such that vibration data cannot be obtained, shutdown of the associated unit will be initiated in accordance with the Action requirements of TS 3.0.3 to an operating mode which permits the affected RCP to be secured.
3. The regularly scheduled flywheel inspections of the Unit 2 RCP flywheels are scheduled to be performed prior to startup from the refueling outage. If the inspections result in unsatisfactory findings that may translate to the Unit 3 RCP flywheels, Unit 3 will be shutdown in accordance with the Action requirements of TS 3.0.3 to an operating mode which permits the affected RCP to be secured.
4. The Unit 1 and Unit 3 RCPs have been verified to be operating within the manufacturers' recommended tolerances for pump vibration.
5. To address other postulated failure sequences, our engineering evaluation is continuing. Should this effort identify new concerns, these compensatory measures will be re-evaluated.

D. Preliminary Evaluation of the Safety Significance of the Request

The maintenance and inspection history of the motors has been reviewed and no service-related defects have been recorded during prior inspections. Several fabrication related indications have been recorded in flywheels used at Unit 1. In 1980 these indications were removed and follow-up inspections in 1985 show no further indications. In 1970, one Unit 1 RCP flywheel was found to have a fabrication defect during a routine overhaul inspection. This flywheel was replaced and no further indications have been noted during subsequent inspections. Based upon this information, SCE has concluded that the likelihood of flywheel failure for the duration of this temporary waiver request is remote. In order to validate this conclusion, a fracture mechanics analysis for the Unit 1 and Unit 3 flywheels is currently underway to confirm that a flaw large enough to propagate to failure within the next 36 days would have been detected during the preceding inspection of each RCP flywheel.

A survey of industry experience related to RCP flywheel failures has identified no recorded failures. This review included discussion with the Unit 1 and Unit 3 reactor suppliers, RCP suppliers, and a review of the Nuclear Plant Reliability Data System data base.

Since the last inspection of the Unit 1 RCP B and C flywheels, there have been approximately 30 starts and 1250 operating days (approximately 3.3 years). Approximately 25 starts and 1100 operating days (approximately 3 years) have accumulated on the Unit 3 RCP flywheels since the last inspection. The additional time the pumps will be running as requested by this temporary waiver represents a small contribution to the total running time.

In summary, it is concluded that the likelihood of flywheel failure for the duration of the temporary waiver, in view of the industry and San Onofre experience related to flywheel structural integrity, is extremely remote.

E. Justification for the Duration of the Temporary Waiver

SCE is requesting that this temporary waiver of compliance be in effect until December 1, 1991, a period of 36 days. With San Onofre Unit 2 currently in a refueling outage, this is considered a prudent amount of time to provide optimum management and control of the various planning activities and allocation of resources among the 3 units. Also, it is considered prudent to avoid subjecting the plant staff to

multiple startup and shutdown transients in a short period of time.

Additionally, as discussed above in Section D, the incremental addition of running time requested by this temporary waiver is not expected to significantly increase the likelihood of flywheel failure.

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 temporary waiver of compliance 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.

As previously discussed, the likelihood of flywheel failure as a result of exceeding the inspection interval is remote, therefore the consequences or probability of an accident previously evaluated will not be significantly increased. The possibility of a new or different kind of accident from any previously evaluated will not be created; nor does this involve a significant reduction in the margin of safety.

G. Basis for No Irreversible Environmental Consequences

It has been determined that this temporary waiver of compliance involves no significant increase in the amounts, and no significant change in the types, of any effluent that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. Accordingly, this temporary waiver of compliance 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 temporary waiver of compliance.

H. Other Information Requested by the NRC

The motors and flywheels for the Unit 1 RCPs were supplied by Westinghouse in 1965. The motors and flywheels for the Unit 3 RCPs were supplied by Byron-Jackson between 1979 and 1980.

Mr. J. B. Martin

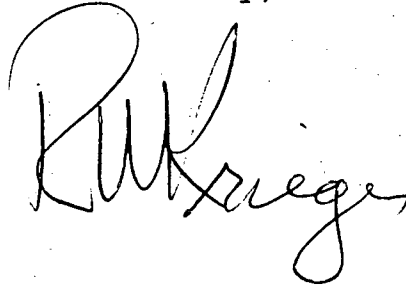
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The San Onofre Nuclear Generating Station Onsite Review Committee has reviewed and approved the actions discussed in this Request for temporary waiver of compliance.

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

Sincerely,

A handwritten signature in cursive script, appearing to read "R. P. Zimmerman". The signature is written in dark ink and is positioned below the word "Sincerely,".

cc:

R. P. Zimmerman, USNRC, Region V
C. W. Caldwell, USNRC Senior Resident Inspector
George Kalman, USNRC Project Manager, Unit 1
M. J. Virgilio, USNRC - NRR