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March 5, 1993

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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Subject: **Docket Nos. 50-361 and 50-362**
First Ten-Year Interval Inservice Inspection Program
San Onofre Nuclear Generating Station
Units 2 and 3

Reference: Letter to Harold B. Ray (SCE) from Theodore R. Quay (NRC) dated December 3, 1992; Subject: Inservice Inspection Relief Requests B-7, B-8, B-9 and Code Case N-481 for San Onofre Nuclear Generating Station, Units 2 and 3 (TAC Nos. M80698 and M80699)

Gentlemen:

This letter requests NRC approval of Inservice Inspection (ISI) program Relief Requests B-10 and B-11 for San Onofre Units 2 and 3. Relief Request B-10 requests relief from performing a VT-1 visual examination on the internal surface of the Reactor Coolant Pump (RCP) casing required by the ASME Code, Section XI, Table IWB-2500-1, Examination Category B-L-2, Item 12.20. Relief Request B-11 requests approval for the option to use the Alternative Weld Repair Methods provided for in the ASME Code Section XI, 1992 edition, IWA-4500.

RELIEF REQUEST B-10

Relief from performing the VT-1 internal visual inspection is requested based on the latest approved edition of the ASME Code (1989 Edition). Relief from this requirement will avoid unnecessary radiation dose to plant workers consistent with maintaining doses as low as reasonably achievable (ALARA).

The currently approved edition of the ASME Code (1989 Edition Table, IWB-2500-1, Category B-L-2, Note 2) requires this inspection only when the pump is disassembled for other reasons. Additionally, the Combustion Engineering's Owners Group Report CEN-412 provides technical justification supporting the relaxation from the Category B-L-1 requirements to perform a volumetric inspection for the reactor coolant pumps operated at San Onofre Units 2 and 3.

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The estimated dose associated with the disassembly of an RCP to perform the required inspections is estimated to be approximately 50 person-REM. Southern California Edison (SCE) believes this personnel radiation exposure is unnecessary based on the technical justification provided in the enclosed relief request. Therefore, this letter submits Relief Request B-10, Enclosure 1.

RELIEF REQUEST B-11

SCE is submitting Relief Request B-11, Enclosure 2, to allow the use of the provisions of the 1992 edition of the ASME Code, Section XI, Article IWA-4500 for the automatic/machine Gas Tungsten Arc Welding (GTAW) process when performing a temperbead weld repair on ferrous base materials.

SCE may need to replace some small bore Inconel 600 nozzles in the reactor coolant system during the next refueling outage, which requires welding on ferrous base material without a post-weld heat treatment (i.e., the temperbead technique) in conjunction with (nonferrous) F43 Inconel filler. SCE is committed to the ASME Code, Section XI, 1977 Edition/Summer 1979 Addenda, which only provides for using the Shielded Metal Arc Welding (SMAW) process.

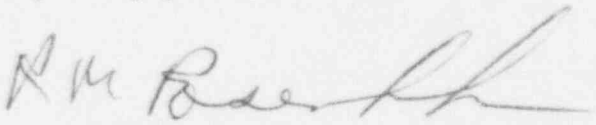
SCE prefers the use of the automatic/machine GTAW process over the manually operated SMAW process for temperbead repairs. The automatic/machine GTAW process is inherently superior for controlling important process variables that affect the overall quality of the weld. Additionally, the automatic/machine GTAW process is less affected by adverse field environments than manual welding.

SCE is aware that Code Case N-432 provides for the use of the automatic/machine GTAW process for the temperbead technique weld repairs on Class 1 components. However, full compliance with this Code Case would require the performance of impact testing (i.e., dropweight and Charpy V-Notch testing) on the weld deposit of the procedure qualification test assembly. In recognition of the low temperature fracture toughness properties of the nickel base alloys, the ASME Code, Section III, Articles NB-4335 and NB-2310 exempt impact testing of non-ferrous materials for procedure qualifications. Although the 1992 Edition of the ASME Code has not been approved by the NRC, the 1992 edition of the ASME Code, Section XI, Article IWA-4500, provides for using the automatic/machine GTAW process and F43 filler metal with the temperbead technique without requiring impact testing on the weld deposit of the procedure qualification test assembly. Therefore, SCE believes that it is not appropriate to expend the effort and resources that would be required to perform impact testing on non-ferrous material.

Your approval of Relief Request B-10 is requested by early June of 1993 to support the Unit 2 Cycle 7 refueling outage, which is the last Unit 2 outage of the first ten year inservice inspection interval. Your approval of Relief Request B-11 is also requested to support the Unit 2 Cycle 7 refueling outage so that if a temperbead weld repair is needed, the automatic/machine GTAW process would be an available option.

If you have any questions regarding these requests, please let me know.

Very truly yours,



cc: J. B. Martin, Regional Administrator, NRC Region V
C. W. Caldwell, NRC Senior Resident Inspector, San Onofre Units 1, 2&3
M. B. Fields, NRC Project Manager, San Onofre Units 2 and 3

RELIEF REQUEST B-10

SYSTEM: Reactor Coolant System

COMPONENT/AREA: Reactor Coolant Pump (RCP) Casing Welds. The casing consists of a volute section and a hub with integrally cast diffuser vanes. These two independently cast sections are welded together.

EXAMINATION CATEGORY: B-L-2, Item B12.20

CLASS: 1

FUNCTION: The Reactor Coolant Pumps operate to maintain reactor coolant flow through the reactor coolant system during normal operation so that heat can be transferred to the steam generators.

EXAMINATION REQUIREMENT: Examination category B-L-2, Item 12.20 for Class 1 Components. VT-1, visual inspection of the internal surfaces of at least one pump in each group of pumps performing similar functions.

BASIS FOR RELIEF: SCE requests to only perform the required VT-1, visual inspection of the pump internals, when the pump is disassembled for other reasons (e.g., maintenance).

The currently approved edition of the ASME Code (1989 Edition, Table IWB-2500-1, Category B-L-2, Note 2) requires this inspection only when the pump is disassembled for other reasons. SCE is committed to the 1977 Edition, through Summer of 1979 Addenda, of the ASME Code which requires the Category B-L-2 inspection. Relief from the Category B-L-2 inspection is based on the Combustion Engineering Owner's group Report CEN-412. The report provides technical justification supporting the relaxation of the Category B-L-1 requirements to perform a volumetric inspection for the reactor coolant pumps operated at San Onofre Units 2 and 3. Because CEN-412 evaluated the safety and serviceability of the pump casing, the results can be applied to support the relaxation of the Category B-L-2 visual internal inspection. Additionally, eliminating the need to disassemble a reactor coolant pump for the sole purpose of performing the internal visual inspection will limit unnecessary dose to plant workers (ALARA).

Reference: Combustion Engineering Owners Group Report CEN-412, "Relaxation of Reactor Coolant Pump Casing Inspection Requirements," November, 1991.

TECHNICAL JUSTIFICATION

CEN-412 documents San Onofre Units 2 and 3 compliance with requirements of Code Case N-481, Section (d). These requirements are:

(1) Evaluate Material Properties, Including Fracture Toughness Values

(2) Perform a Stress Analysis of the Pump Casing

(3) Review of Operating History of the Pump

(4) Selecting Locations for Postulating Flaws

(5) Postulating One-Quarter Thickness Flaw with Length Six Times Its Depth

(6) Establishing the Stability of the Selected Flaw Under the Governing Stress Condition

(7) Consider Thermal Aging Embrittlement and Any Other Processes that May Degrade the Properties of the Pump Casing During Service

With respect to item (5), the Code Case requires the postulating of a one-quarter thickness flaw with length six times its depth. The Owners Group report evaluates crack growth starting with an 8% of the casing thickness crack. Nevertheless, as required by the Code Case and stated in the Owners Group report, the report (CEN-412) verified that 25%-of-depth cracks are found to be stable against Design Condition, Emergency Condition, and Faulted Condition loads.

To satisfy requirements of the Code Case item (7), for consideration of processes that may degrade the properties of the pump casing during service, an initial crack of 8% at the start of service was assumed. The crack is assumed to grow with repeated cycling and under the governing stress conditions through the Code Case postulated 25% depth, and then continuing until the end point crack size is reached.

The reference flaw of 8% used in CEN-412 was selected based on the assumption that it would be the largest flaw that could be missed during the preservice inspection. SCE believes this is a conservative assumption because an initial crack depth of 8% would have been easily detectable by pre-service inspection, as it is four times the depth of the 2% crack required by the ASME Code to be detectable by radiographic detection techniques. This assumption of initial crack size is further substantiated by Bulletin WRC-175 of August, 1972 which states that, with the combination of examination requirements of ASME Section III and XI (radiography and ultrasonic mapping, respectively), the probability of a crack four times greater than the 2 percent radiography standard escaping detection is evaluated as being "very low." No detectable cracks are permitted by ASME Section III.

SCE recently reviewed the original radiographic reader sheets for the appropriate ASME Code pressure retaining sections, including the hub/diffuser section, the scroll section, and the hub to scroll fabrication weld to re-verify this requirement was met.

The results of the crack growth analysis show that the postulated 8% initial crack will grow to 25% in about 60 years under the influence of the conservatively defined stress cycles in the design specification. The hypothesized crack will then grow larger until it reaches an end-point crack size of 37%t, limited by the ultimate tensile strength, in about 72 years.

Performance of these evaluation steps in CEN-412 demonstrated the safety and serviceability of the San Onofre Units 2 and 3 RCP pump casings without performing either a visual or a volumetric examination.

ALARA

The dose associated with the disassembly of a RCP to perform the required inspections is estimated to be approximately 50 person-REM. SCE believes this personnel radiation exposure for the sole purpose of this inspection is unnecessary based on the technical justification presented above.

ALTERNATE EXAMINATION: Perform a VT-1 internal visual inspection of the internal surfaces whenever a pump is disassembled for maintenance.

RELIEF REQUEST B-11

SYSTEM: Reactor Coolant System

COMPONENT/AREA: Pressurizer instrument nozzle and heater sleeve pressure boundary welds located on the pressurizer.

CLASS: 1

FUNCTION: To provide part of the pressure boundary for the Class 1 Reactor Coolant System.

WELD PROCESS REQUIREMENT: The ASME Code, Sections III and XI, 1977 Edition/Summer 1979 Addenda only provides for a temperbead weld utilizing the Shielded Metal Arc Welding (SMAW) process.

BASIS FOR RELIEF: SCE is requesting to use the Automatic/machine Gas Tungsten Arc Welding (GTAW) process and F43 filler metal with the temperbead technique as provided for in the 1992 Edition of the ASME Code, Section XI, Article IWA-4500.

The objective of a temperbead weld repair is to deposit a quality, defect free weld with acceptable mechanical properties in the weld and heat affected zone without the need for post weld heat treatment.

The automatic/machine GTAW process is inherently superior to the manually operated SMAW process for controlling important process variables that affect the overall quality of the weld, such as electrode manipulation, travel speed, and arc energy. Because of automation, the negative affects on weld quality from adverse field environments are less pronounced with the automatic/machine GTAW process than with the manual SMAW process.

ALTERNATE WELD PROCESS: Automatic/machine Gas Tungsten Arc Welding process and F43 filler metal with the temperbead technique as provided for in the 1992 Edition of the ASME Code, Section XI, Article IWA-4500.