



CHAIRMAN

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

PDR
50-206

May 10, 1989

The Honorable Bill Lowery
United States House of Representatives
Washington, D. C. 20515

Dear Congressman Lowery:

I am responding to your letter of May 4, 1989, in which you expressed concern regarding the operation of Southern California Edison's (Edison) San Onofre Unit 1 facility with cracked bolts in the reactor vessel thermal shield. The Nuclear Regulatory Commission (NRC) staff has been aware of the cracked bolts since January 1989.

The thermal shield (see enclosed diagram) is a 2-1/2 inch thick cylinder that surrounds the reactor core barrel. Its purpose is to absorb gamma rays emitted by the reactor to reduce heating and consequent thermal stress in the reactor vessel wall. The thermal shield also absorbs high-energy neutrons, reducing irradiation damage to the vessel wall. Bolts are used to attach the bottom of the thermal shield to the core barrel, and spring-like devices called flexures are attached at the top. Four lateral displacement limiters are also located at the top.

On January 3, 1989, Southern California Edison conducted a visual inspection of the thermal shield with a remote camera; 24 of 30 bolts could be visually inspected. Three bolts out of the 24 inspected were found to be broken. In addition, the locking devices for two bolts and the locking device for one dowel pin had cracks. Five out of six flexures at the top of the thermal shield have been broken since 1978. The flexures were originally added to provide radial and tangential restraint to the top of the thermal shield. When these were discovered to be broken, an evaluation was made which concluded that the flexures were unnecessary. As a result of the January inspection, the licensee found no evidence of damage to or motion of the thermal shield.

On January 31, 1989, the NRC sent the licensee a letter requiring that this matter be resolved to our satisfaction before plant startup. The licensee and its consultant, Westinghouse Electric Corporation, provided an analysis of the thermal shield in its present condition. The analysis concludes that the thermal shield will remain safely in place, or, in the unlikely event it should move, flow to the reactor core would not be significantly

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CORRESPONDENCE PDC

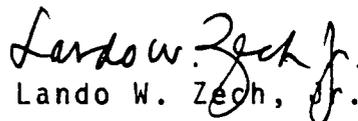
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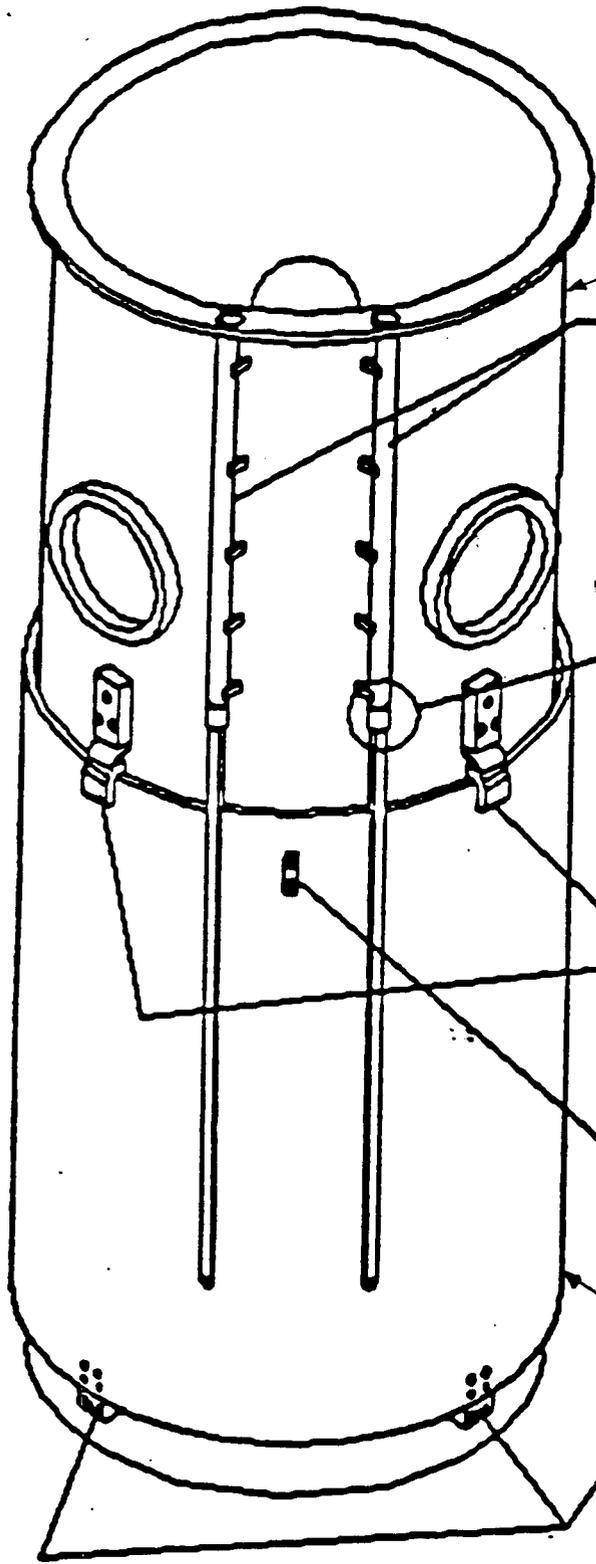
affected. Based on the analysis, the licensee has proposed to return San Onofre Unit 1 to power and monitor the condition of the thermal shield during operation by using neutron noise analysis and acoustical techniques. Although the sixth flexure is no longer necessary, the licensee's monitoring program will include monitoring of this flexure, since failure of the sixth flexure could be an indication of motion of the thermal shield beyond what is predicted. The neutron noise analysis would detect a change in vibration should the sixth flexure fail and this would require the licensee to shut down for repairs. A mid-cycle inspection would also be conducted not later than June 30, 1990, to visually confirm the expected behavior of the thermal shield. If the inspection proves satisfactory, the licensee would operate until about January 1991, at which time repairs would be conducted.

The staff has reviewed the analysis and concurs with the licensee's evaluation subject to the implementation of the monitoring program and mid-cycle inspection. The review fully addressed the structural integrity of the thermal shield supports, the licensee's ability to monitor significant changes, and the acceptability of the consequences of a failure of the thermal shield supports. The staff is in the process of finalizing a license amendment which would allow operation as proposed.

Sincerely,


Lando W. Zech, Jr.

Enclosure:
As Stated



CORE BARREL

SPECIMEN TUBE

SPECIMEN TUBE

NO DAMAGE NOTED

SPECIMEN BASKET

EXPANSION JOINT

FLEXURE FIXTURE 5 OF 6 BROKEN OR CRACKED SINCE 197
 (TYP 6 PLACES) NO CHANGE NOTED

LIMITER KEY
 (TYP 4 PLACES)

THERMAL SHIELD

THERMAL SHIELD
 SUPPORT BLOCK
 (TYP 6 PLACES)

5 BOLTS PER SUPPORT BLOC:
 3 BOLTS (TOTAL) BROKEN
 AFFECTING 2 OF 6 SUPPORT:



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

May 10, 1989

CHAIRMAN

The Honorable Ron Packard
United States House of Representatives
Washington, D. C. 20515

Dear Congressman Packard:

I am responding to your letter of May 4, 1989, in which you expressed concern regarding the operation of Southern California Edison's (Edison) San Onofre Unit 1 facility with cracked bolts in the reactor vessel thermal shield. The Nuclear Regulatory Commission (NRC) staff has been aware of the cracked bolts since January 1989.

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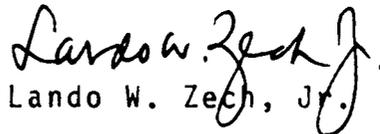
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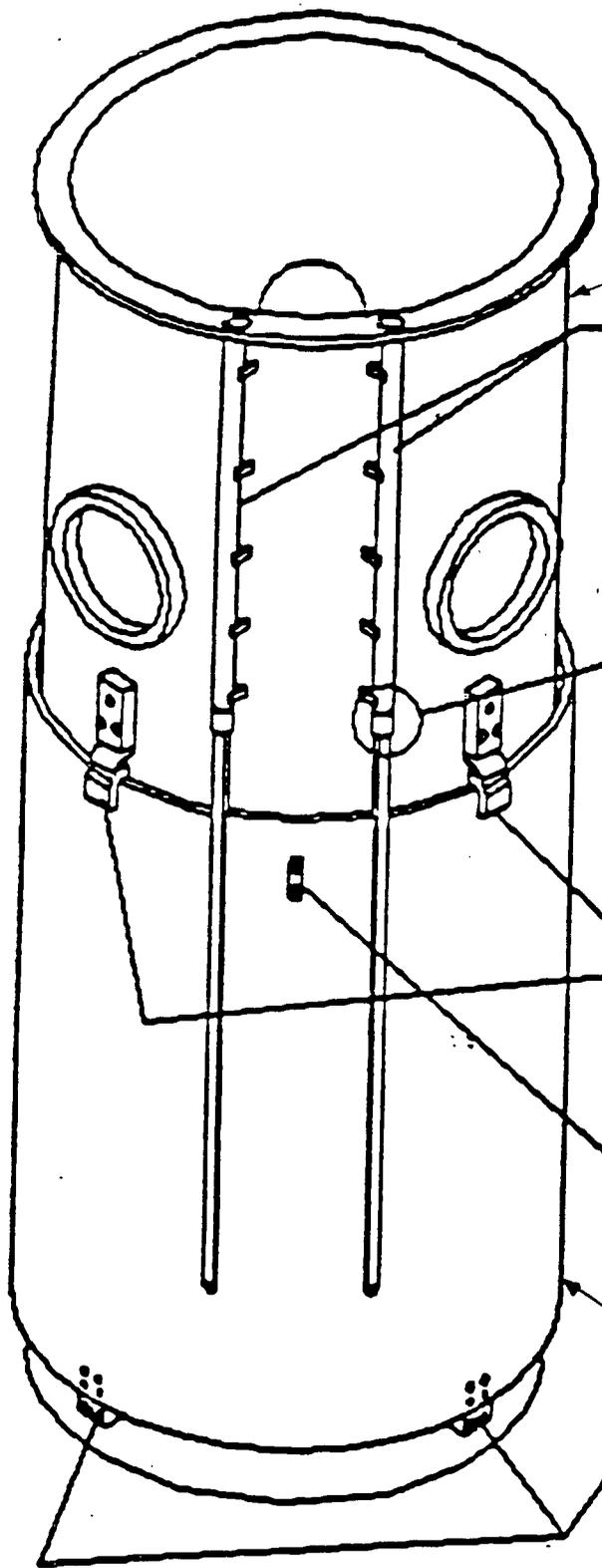
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Sincerely,


Lando W. Zech, Jr.

Enclosure:
As Stated



CORE BARREL

SPECIMEN TUBE

SPECIMEN TUBE

NO DAMAGE NOTED

SPECIMEN BASKET

EXPANSION JOINT

FLEXURE FIXTURE (TYP 6 PLACES) 5 OF 6 BROKEN OR CRACKED SINCE 19
NO CHANGE NOTED

LIMITER KEY (TYP 4 PLACES)

THERMAL SHIELD

THERMAL SHIELD SUPPORT BLOCK (TYP 6 PLACES)

5 BOLTS PER SUPPORT BLOC
3 BOLTS (TOTAL) BROKEN
AFFECTING 2 OF 6 SUPPOR



CHAIRMAN

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

May 10, 1989

The Honorable Duncan Hunter
United States House of Representatives
Washington, D. C. 20515

Dear Congressman Hunter:

I am responding to your letter of May 4, 1989, in which you expressed concern regarding the operation of Southern California Edison's (Edison) San Onofre Unit 1 facility with cracked bolts in the reactor vessel thermal shield. The Nuclear Regulatory Commission (NRC) staff has been aware of the cracked bolts since January 1989.

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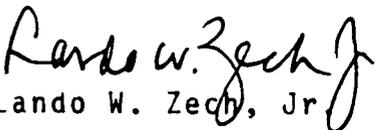
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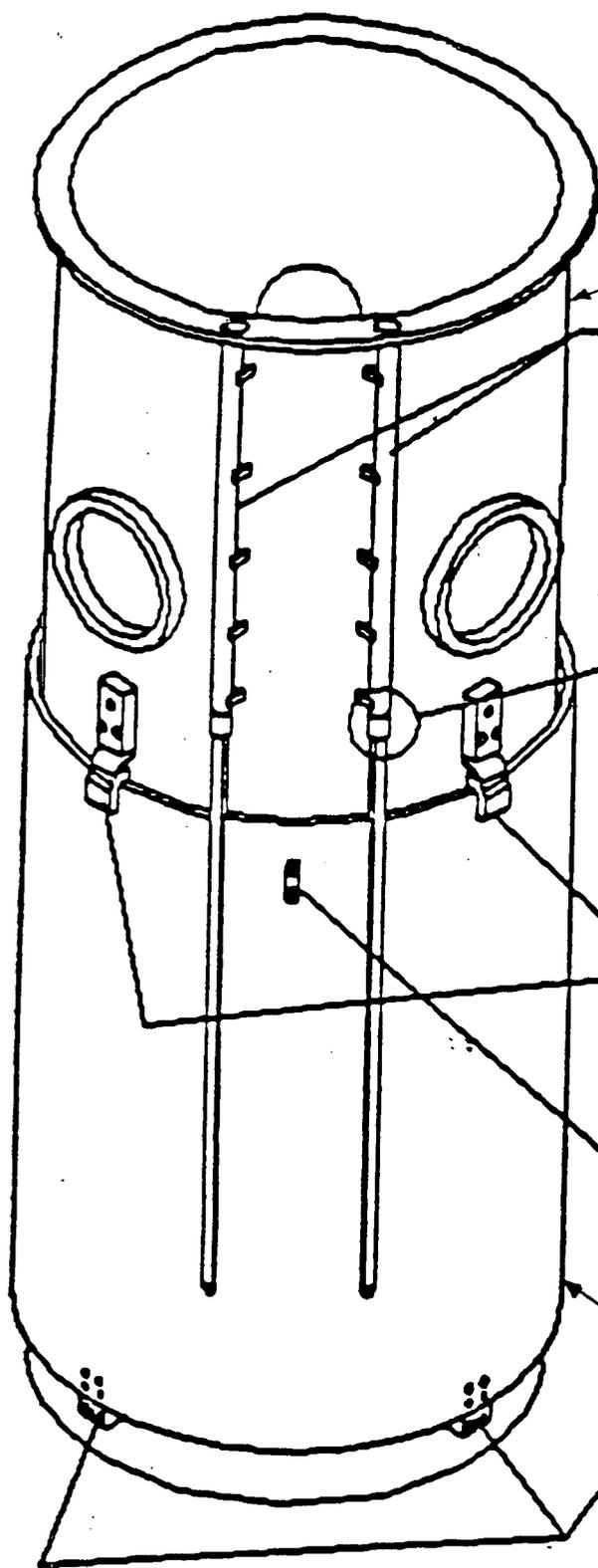
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Sincerely,


Lando W. Zech, Jr.

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As Stated



CORE BARREL

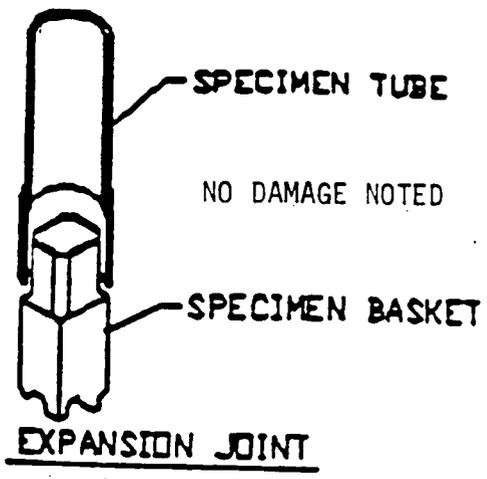
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FLEXURE FIXTURE 5 OF 6 BROKEN OR CRACKED SINCE 19
 (TYP 6 PLACES) NO CHANGE NOTED

LIMITER KEY
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THERMAL SHIELD

THERMAL SHIELD
 SUPPORT BLOCK
 (TYP 6 PLACES)



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NO DAMAGE NOTED

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EXPANSION JOINT

5 BOLTS PER SUPPORT BLC
 3 BOLTS (TOTAL) BROKEN
 AFFECTING 2 OF 6 SUPPOR