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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V
1990 N. CALIFORNIA BOULEVARD
SUITE 202, WALNUT CREEK PLAZA
WALNUT CREEK, CALIFORNIA 94596

July 23, 1980

Docket Nos. 50-206, 50-361, 50-362

Southern California Edison Company
P. O. Box 800
2244 Walnut Grove Avenue
Rosemead, California 91770

Attention: Dr. L. T. Papay, Vice President
Advanced Engineering

Gentlemen:

The enclosed IE Circular No. 80-17, is forwarded to you for information. If there are any questions related to your understanding of the suggested actions, please contact this office.

Sincerely,

R. H. Engelken
Director

Enclosures:
1. IE Circular No. 80-17
2. List of Recently Issued IE Circulars

cc w/enclosures:
J. M. Curran, SCE
R. Dietch, SCE

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

July 23, 1980

IE Circular No. 80-17

FUEL PIN DAMAGE DUE TO WATER JET FROM BAFFLE PLATE CORNER

Description of Circumstances:

On May 8, 1980, Portland General Electric submitted a Licensee Event Report No. 344/80-06, concerning the April, 1980 discovery of failure of a fuel pin in each of two assemblies during the past operating cycle. The LER stated that each of the fuel pins was located adjacent to a joint in the core baffle, and that the failures had resulted from tube vibration resulting from water jet impingement on the fuel pin.

This general type of damage has been experienced previously. Three damaged fuel pins were found in 1971-72 at a non-domestic power plant. Subsequently, one failed pin was found in 1973 and again in 1975 at non-domestic plants. In 1975, one fuel pin failed at Point Beach. These six fuel pin failures involved bypass flow through gaps in the inside corner of the baffle (the fuel "sees" a 90 angle, i.e., the edge of a box as seen from inside the box). The baffle joints in these plants had not been peened prior to initial core loading. Joints were peened following discovery of the failures, and no subsequent damage has been observed near the joints where the above failures were discovered.

More recently, in July 1979 fuel pin damage was detected in ten fuel assemblies at the Swedish Plant, Ringhals Unit 2. In November, 1979 fuel pin damage was reported at the KO-RI Unit 1 in Korea on two fuel assemblies. Most recently in April, 1980 fuel pin failures were discovered in two assemblies at the end of Cycle 2 in Trojan. In all three of the above recent instances, the failures were encountered in assemblies which had been associated with center injection points (the fuel "sees" a 270 angle, i.e., the edge of a box as seen from outside the box). In addition in all three, the core support structures utilized a baffle plate design with a reduced number of edge to edge bolts on adjoining baffles.

An ultimate fix of the baffle joint problem is to peen the entire joint with a "flat land" peening technique to reduce the gap between baffle segments. Because of scheduling concerns, this was not accomplished at Trojan during the recent outage. Instead, PGE decided to install stainless steel pins adjacent to the two baffle joints of concern, and delay further peening efforts until the next refueling outage.

High velocity coolant cross flow ("jetting") through the gaps of the core baffle joints can result in damage to only a very limited number (usually 1 or 2) fuel pins, and only at certain discrete elevations on those pins. Since

there is no mechanism for propagation of the failures to adjacent pins, these failures are not viewed as a significant safety concern. However, in order to keep fuel failures and resulting primary coolant activity levels as low as possible, we recommend the following actions.

Recommended Actions for PWR Construction Permit Holders and PWR Licensees:

1. Determine core locations that might be subject to water jet impingement upon fuel pins that could potentially be damaged by fretting.

2. (Licensees only). Examine fuel pins that were discharged from those locations, or are now at those locations (during the next refueling outage).

3. Take appropriate actions to correct/prevent occurrence of this problem.

Although this problem has appeared only in certain Westinghouse PWRs, this Circular is being distributed to all PWRs since there may be other designs where the "as installed" core baffle may have plant specific features which could contribute to similar failures.

No written response to this Circular is required. If you desire additional information regarding this matter, contact the Director of the appropriate NRC Regional Office.

IE Circular No. 80-17
July 23, 1980

Enclosure

RECENTLY ISSUED
IE CIRCULARS

Circular No.	Subject	Date of Issue	Issued to
80-16	Operational Deficiencies In Rosemount Model 510DU Trip Units And Model 1152 Pressure Transmitters	6/27/80	All power reactor facilities with an OL or a CP
80-15	Loss of Reactor Coolant Pump Cooling and Natural Circulation Cooldown	6/20/80	All power reactor facilities with an OL or CP
80-14	Radioactive Contamination of Plant Demineralized Water System and Resultant Internal Contamination of Personnel	6/24/80	All holders of Power and Research Reactor licensees (Operating and Construction Permits), and Fuel Cycle licensees
80-13	Grid Strap Damage in Westinghouse Fuel Assemblies	5/18/80	All holders of Reactor OLs and CPs
80-12	Valve-Shaft-To-Actuator Key May Fall Out of Place When Mounted Below Horizontal Axis	5/14/80	All holders of Reactor OLs and CPs
80-11	Emergency Diesel Generator Lube Oil Cooler Failures	5/13/80	All holders of a power reactor OL or CP
80-10	Failure to Maintain Environmental Qualification of Equipment	4/29/80	All holders of Reactor OLs and CPs
80-09	Problems With Plant Internal Communications Systems	4/28/80	All holders of a power reactor OL or CP
80-08	BWR Technical Specification Inconsistency - RPS Response Time	4/18/80	All General Electric BWR's holding a power reactor OL
80-07	Problems with HPCI Turbine Oil System	4/3/80	All holders of a power reactor OL or CP