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SUBJECT: Suppl 120-day response to GL 97-01, "Degradation of Control Rod Drive Mechanism Nozzle & Other Vessel Closure & Head Penetrations."

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INDIANA MICHIGAN POWER

November 4, 1997

AEP:NRC:1218D

Docket Nos.: 50-315
50-316

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

Gentlemen:

Donald C. Cook Nuclear Plant Units 1 and 2
GENERIC LETTER 97-01, "DEGRADATION OF CONTROL ROD DRIVE MECHANISM NOZZLE AND OTHER VESSEL CLOSURE HEAD PENETRATIONS"
120 DAY RESPONSE - SUPPLEMENT

This letter and its attachment respond to item two of generic letter (GL) 97-01, "Degradation of Control Rod Drive Mechanism Nozzle and Other Vessel Closure Head Penetrations", dated April 1, 1997, and is a supplement to our letter AEP:NRC:1218C, dated August 1, 1997.

The attachment to this letter contains the response to item two of GL 97-01 after completion of our records search to determine past resin ingress into the reactor coolant system.

Sincerely,

E. E. Fitzpatrick
Vice President

SWORN TO AND SUBSCRIBED BEFORE ME
THIS 4th DAY OF November 1997

Janice M. Bickers
Notary Public

My Commission Expires 2/16/2001

JANICE M. BICKERS
Notary Public, Berrien County, MI
My Commission Expires Feb. 16, 2001

vlb

Attachment

A075 1/1

c: A. A. Blind
A. B. Beach
MDEQ - DW & RPD
NRC Resident Inspector
J. R. Padgett

ATTACHMENT TO AEP:NRC:1218D

DONALD C. COOK NUCLEAR PLANT UNITS 1 AND 2
GENERIC LETTER 97-01
"DEGRADATION OF CONTROL ROD DRIVE MECHANISM NOZZLE
AND OTHER VESSEL CLOSURE HEAD PENETRATIONS"
120 DAY RESPONSE - SUPPLEMENT

Introduction

Item 2 of NRC generic letter (GL) 97-01, "Degradation of Control Rod Drive Mechanism Nozzle and Other Vessel Closure Head Penetrations", requests information related to past resin bead intrusions into the reactor coolant system (RCS). A records search was conducted to provide a response to this item. The following is offered as the response to item 2 of GL 97-01.

2. Provide a description of any resin bead intrusions, as described in IN 96-11, that have exceeded the current EPRI PWR Primary Water Chemistry Guidelines recommendations for primary water sulfate levels, including the following information:

2.1 Were the intrusions cation, anion, or mixed bed?

Response

We have reviewed plant records using the intrusion volume criteria agreed upon by the industry (WCAP 14901, July 1997). This data search was structured to identify resin intrusion events into the primary coolant system with a magnitude greater than 1 ft^3 (7.48 gallons). The threshold of 1 ft^3 was chosen as a conservative lower bound because it represents less than 15% of the estimated volume of resin released in the reactor coolant system during the events at Jose Cabrera. The value of 1 ft^3 was selected as a screening limit by the NEI alloy 600 RPV head penetration cracking task force.

For the period of plant operation prior to the routine analysis for sulfate in reactor coolant, the data search was based on a review of the plant's reactor coolant chemistry record relative to specific conductance of the reactor coolant. An elevation of a 28 micro S/cm increment in specific conductance was the value used as an indicator of cation resin ingress equivalent to a volume of 1 ft^3.

Routine analysis for sulfate in reactor coolant was performed for plant operation from 1987 to the present. A sulfate concentration in the range of 15 to 17 ppm peak concentration was used as the indicator of cation resin ingress. This concentration is approximately equivalent to a volume of 1 ft^3.

Had either specific conductance or sulfate increases indicated resin ingress to the magnitude of the threshold quantity identified above, additional data evaluation was conducted to look for a corresponding depression in pH or elevation in lithium as corroborating information of the incident. In the case of the use of sulfate data as the indicator, specific conductance was also included as confirmatory data that a significant in-leakage event had been identified.

In letter AEP:NRC:1218C, dated August 1, 1997, we stated that it is unnecessary to review plant records for boron, chlorides, and oxygen, because these species are not viewed as valid indicators of cation resin ingress and degradation within the primary coolant system of a pressurized water reactor. In addition, we believe it is unnecessary to review

plant records for fluorides and lithium, as sulfur is a major constituent in all cation resin beads and was the specie identified in GL 97-01 as the cause of the corrosion.

Based upon review of plant records, neither unit experienced a resin ingress into the RCS that exceeded the industry criteria as noted above.

2.2 What were the durations of these intrusions?

Response

Based upon review of plant records, neither unit experienced a resin ingress into the RCS that exceeded the industry criteria as noted above.

2.3 Does the plant's RCS water chemistry Technical Specifications follow the EPRI guidelines?

Response

Cook Nuclear Plant's RCS water chemistry specifications follow the RCS control parameters in EPRI primary water chemistry guidelines, revision 2, issued in November 1990.

2.4 Identify any RCS chemistry excursions that exceed the plant administrative limits for the following species: sulfates, chlorides or fluorides, oxygen, boron, and lithium.

Response

We believe that it is unnecessary to review plant records for boron, chlorides or fluorides, lithium, and oxygen because these species are not viewed as valid indicators of cation resin ingress and degradation within the primary coolant system of a pressurized water reactor. Review of RCS sulfate analysis, which began in 1987, did not indicate any sulfate level above several hundred ppb, which is well below the NEI threshold of 15 ppm.

2.5 Identify any conductivity excursions which may be indicative of resin intrusions. Provide a technical assessment of each excursion and any follow-up actions.

Response

Following the NEI format, RCS chemistry data was reviewed to identify any increase in specific conductance of at least 28 micro S/cm. This review identified two chemistry excursions with a specific conductance increase exceeding 28 micro S/cm.

The first of these chemistry excursions occurred on January 16, 1980, and affected unit 2. At the time, unit 2 was at the end of a refueling outage in mode 3 when the specific conductance was measured at 238 micro S/cm. The specific conductance had previously been measured in the lower 50s. Additional analyses indicated a chloride spike to 150 ppb, ammonia at 3.75 ppm, boron at 1908 ppm, lithium at 470 ppb and the pH at 6.85. The previous day's pH was 6.0, which indicated the change was in the basic direction. Sodium was analyzed at 73.5 ppm. Investigation determined

the cause of the excursion was sodium hydroxide ingress from testing the containment spray additive system and not flushing the piping following the testing. The resulting calculated conductivity and pH from these ions correspond to the measured conductivity and pH sufficiently to conclude that the excursion was not related to a resin ingress.

The second chemistry excursion indicated a specific conductance increase from 5.89 to 39.2 micro S/cm on November 11, 1992 in the unit 2 RCS. The pH increased from 4.82 to 5.86, and the lithium increased from well less than 1 ppm to 3.5 ppm. Notations on the chemistry data sheet indicate a lithium hydroxide addition following the earlier low lithium analysis. The resultant pH and conductivity increase are clearly due to the lithium hydroxide addition. The calculated pH and conductivity corresponds to the measured values. If 15 ppm of sulfates were present as well, the calculated pH and conductivity would have been 5.5 pH units and 50 micro S/cm, respectively. Therefore, this excursion was not due to a resin ingress, but instead due to the addition of lithium hydroxide.

2.6 **Provide an assessment of the potential for any of these intrusions to result in a significant increase in the probability for IGA of VHPs and any associated plan for inspections.**

Response

Based upon review of plant records, neither unit experienced a resin ingress into the RCS that exceeded the industry criteria as noted above.