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Donald C. Cook Nuclear Plant Unit Nos. 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT
JULY 1, 1987 TO DECEMBER 31, 1987

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

ATTN: T. E. Murley

February 26, 1988

Dear Dr. Murley:

This letter transmits the Radioactive Effluent Release Report for the Donald C. Cook Nuclear Plant Units 1 and 2, for the period from July 1 to December 31, 1987. This report was prepared in accordance with Section 6.9.1.9 of the Plant's "Appendix A Technical Specification."

This document has been prepared following Corporate procedures which incorporate a reasonable set of controls to ensure its accuracy and completeness prior to signature by the undersigned.

Very truly yours,

M. P. Alexich

edg

Enclosure

cc: D. H. Williams, Jr., w/o enclosure
W. G. Smith, Jr. - Bridgman
G. Bruchmann
R. C. Callen
G. Charnoff
NRC Resident Inspector - Bridgman
A. B. Davis - Region III Administrator

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SAIC-88/3122

TECHNICAL EVALUATION REPORT FOR D.C. COOK NUCLEAR PLANT, UNIT 2 "OPERATION OF UNIT 2 THROUGH THE END OF THE CURRENT FUEL CYCLE"

February 12, 1988

Science Applications International Corporation

Prepared for:

U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Contract NRC-03-87-029
Task Order No. 09

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TABLE OF CONTENTS

LIST OF TABLES

1. INTRODUCTION

By letter dated November 24, 1987 Indiana and Michigan Electric Company provided the Nuclear Regulatory Commission (NRC) staff with information concerning the results of steam generator tube eddy current inspections performed at the Donald C. Cook Nuclear Plant Unit 2 during September 1987, and with justification for continuing operation through the end of the current fuel cycle (5.2 effective full-power months [EFPMs] since restart in October 1987) with no scheduled interim shutdown for steam generator tube inspections.

While this evaluation focuses on a review of the September 1987 eddy current inspection results and justification for continuing operation, it also addresses the restriction placed on power operation because of 1985 steam generator tube inspection results. Also included in this evaluation is a review of the steam generator tube inspections and actions taken by Indiana and Michigan Electric Power Company to justify continuing operation as a result of a March 3, 1987 steam generator tube leak at D.C. Cook Unit 2. Referenced tables have been selected from the licensee's submissions.

2. BACKGROUND

D.C. Cook Unit 2 incorporates a nuclear steam supply system manufactured by Westinghouse, and is licensed for 3411 MWt. Initial criticality occurred on March 10, 1978. The unit has four Westinghouse Series 51 steam generators, each with 3388 Inconel 600 tubes.

The first significant indication of secondary side tube corrosion in the D.C. Cook Unit 2 steam generators occurred in November 1983, when the unit was removed from service due to steam generator tube leakage. A leak of 0.29 gallons per minute (gpm) was found in tube R16-C40 of steam generator 21. Eddy current testing of 1225 tubes in two steam generators resulted in the plugging of three tubes, all due to indications of secondary side corrosion.

Indiana and Michigan Electric Power Co. initiated a refueling outage of D.C. Cook Unit 2 on March 10, 1984, at which time eddy current inspections of all four steam generators were conducted. Eddy current data resulted in the plugging of 68 tubes due to secondary side corrosion. Indications were at or above the tubesheet and in the tubesheet crevice region. Sections of seven tubes were removed for metallurgical examinations, which confirmed that tube degradation was due to intergranular attack/stress corrosion cracking (IGA/SCC), probably caused by a caustic environment.

On July 15, 1985, D.C. Cook Unit 2 was removed from service when a primary-to-secondary leak of 0.22 gpm developed. Visual inspection showed tube R16-C56 leaking in steam generator 23. Eddy current examination of the leaking tube revealed a defect about 1 inch below the top of the tubesheet. Additional eddy current testing of a block of twenty-four tubes around the leaking tube revealed another tube (R15-C56) with a pluggable indication. The two tubes were plugged and the unit was returned to service.

On August 2, 1985, during restart, leakage was detected in steam generator 23. The unit was again removed from service and approximately 1500 tubes were inspected. Thirty-five tubes were plugged as a result of these inspections. Two of these tubes (R7-C28 and R14-C70) were suspect leakers. Many of the 35 plugged tubes had no previous indications, suggesting a rapid progression of IGA/SCC. Additions of boric acid were made to the secondary side of the steam generators to neutralize the alkaline environment and thus possibly slow the rate of IGA/SCC.

The unit was restarted on August 22, 1985. On August 23, during a 30% power boric acid soak, another leak of 0.2 gpm was detected. All four steam generators were opened and the tubes were leak tested. Leaks were found in tube R14-C41 of steam generator 22 and in tube R19-C52 of steam generator 24.

Because two leaking tubes were found, all tubes, except for the 1500 inspected August 2, 1985, were eddy current tested. As a result of these examinations, a total of 147 tubes were plugged: 93 for exceeding the 40% throughwall Technical Specifications plugging limit, and the remaining 54

for Indiana and Michigan Electric Power Co.'s self-imposed plugging limits that include any indications in the tubesheet crevice region or indications greater than 30% above the tubesheet. Sections of five tubes were removed for metallurgical and chemical tests. The samples were from the tubesheet crevice area and support plate locations. IGA/SCC was found at both locations.

As a result of these inspections and tests, Indiana and Michigan Electric Power Co. administratively limited thermal power output to 80% in order to reduce the primary side temperatures in an attempt to slow the rate of tube degradation. Secondary side chemistry treatment included on-line boric acid additions to inhibit caustic-induced tube corrosion; boron concentration was maintained at 5 to 10 ppm. These measures were expected to: a) neutralize the caustic environment which had contributed to IGA/SCC, b) change the environment to shift the susceptible electrical potential range for corrosion of Inconel 600, and c) prevent mass transfer within the inhibitor film by reformation of a passive film. Additionally, Indiana and Michigan Electric Power Co. supported the reduction of caustic factors with processes to open restrictive crevices and remove sludge and to reduce contamination input through improved chemistry control.

D.C. Cook Unit 2 returned to service on October 23, 1985 and ran without significant steam generator-related problems until a February 28, 1986 scheduled refueling shutdown. At the time of the shutdown, steam generator primary-to-secondary leakage was in the range of 0.001 to 0.04 gpm. Leak testing revealed a leaking tube (R16-C45) in steam generator 22. The leaking tube had an indication one inch below the top of the tubesheet on the hot leg side of the steam generator. Eddy current inspections of all the tubes resulted in the plugging of 151 tubes.

On July 7, 1986, prior to restart of D.C. Cook Unit 2 for Fuel Cycle 6, there was a total of 763 plugged tubes in D.C. Cook Unit 2 steam generators. There were 142 plugged tubes in steam generator 21, 210 plugged tubes in steam generator 22, 210 plugged tubes in steam generator 23, and 201 plugged tubes in steam generator 24.

D.C. Cook Unit 2 ran continuously for a period of 226 calendar days, from the start of Fuel Cycle 6 on July 7, 1986 through March 3, 1987, when the unit was removed from service due to an indicated primary-to-secondary leak of 0.247 gpm in steam generator 22. Although the measured leak rate was below the Technical Specification leak rate limit of 500 gallons per day (gpd) or 0.347 gallons per minute (gpm), Indiana and Michigan Electric Power Co. elected to verify the condition of the D.C. Cook Unit 2 steam generator tube bundles by performing eddy current inspections consistent with the requirements of Technical Specification 3/4.4.5.

In a letter to the NRC dated May 22, 1987, Indiana and Michigan Electric Power Co. attached a report entitled "Steam Generator Tube Integrity, April 1987 - An Assessment of the Next Operating Interval Length." This report provided information on the March 1987 steam generator inspection results, corrective actions taken to restore steam generator tube integrity, and justification for continuing operation for 4.7 effective full-power months (EFPMs).

The March 3, 1987 leaking tube in steam generator 22 was identified by hydrostatic testing as tube R28-C53 and was subsequently confirmed by eddy current testing to have a throughwall defect in the hot leg tubesheet crevice about 3.7 inches below the tubesheet surface. This defect was noted to be typical of the secondary side IGA/SCC previously identified in D.C. Cook Unit 2 steam generators.

The March 1987 eddy current inspection program started with an initial sample of about 6% of the tubes in steam generators 22 and 24. Test results necessitated expanding the inspections to potentially affected areas of all tubes in each steam generator. For these inspections, the criteria used to analyze eddy current data and the criteria used for tube plugging were the same as those used for the 1986 inspections (see Section 3, Discussion). The eddy current tests revealed a total of 715 tubes with indications, resulting in the plugging of 110 tubes. The breakdown of the number of tubes with eddy current indications and the number of tubes that were plugged is summarized in Table 1.

TABLE 1

INDICATIONS OF HOT LEG SECONDARY SIDE CORROSION
MARCH 1987 EDDY CURRENT INSPECTIONS

	≤39%	≥40%	DI	UDS	SQR	Total
Support Plates	14	21	594	0	N/A	629
Tubesheet Surface	3	7	19	2	N/A	31
Tubesheet Crevice	0	5	2	6	42	55
Total	17	33	615	8	42	715

DI = Distorted Indication

SQR = Squirrel (a particular DI in the crevice region)

UDS = Undefined Signal

Notes: (a) Plugging criteria are illustrated by the boundary line in the above table (107 tubes); in addition, 3 tubes were plugged due to reasons unrelated to secondary side corrosion (2 because EC testing could not be performed, and 1 as a precautionary measure due to a distorted indication at the tubesheet roll transition); 110 total tubes were plugged.

(b) Numbers in the above table represent individual tubes; for tubes with indications at multiple locations, only the indication deemed most severe is listed.

Reference: AEP:NRC:0936G, dated April 9, 1987

Conservatively using degradation growth rate models based on 1985-1986 and 1986-1987 degradation rates, Indiana and Michigan Electric Power Co. established an operating interval of 4.7 EFPMs before the next inspection, which represented the midpoint of the remaining fuel cycle plus an allowance to provide some flexibility in scheduling the steam generator inspection outage. However, D.C. Cook Unit 2 was electively removed from service after approximately 3.0 EFPMs to investigate potential concerns associated with anchoring of reactor coolant pump hatch bolts. Since the pump hatch investigation was scheduled to take several days, Indiana and Michigan Electric Power Co. decided to initiate the steam generator inspection outage to minimize the composite outage time.

3. DISCUSSION

In its letter submittal of November 24, 1987, Indiana and Michigan Electric Power Co. provided the following information regarding the results of the steam generator tube eddy current inspections of D.C. Cook Unit 2 during September 1987, and presented justification for continuing operation through the end of the current fuel cycle (5.2 EFPMs since restart in October 1987) with no scheduled interim shutdown for steam generator inspections.

A complete eddy current inspection of the hot legs of all four steam generator tubes was performed between September 12 and September 26, 1987.

3.1 Eddy Current Data Analysis Criteria

The criteria used to analyze the eddy current data during the September 1987 inspections were the same as those used during the March 1987 inspections. These criteria were developed from a correlation of field bobbin coil eddy current data with metallography results of tube samples removed in 1984 and 1985. The following is a brief summary of pertinent eddy current signal classifications:

- o Clear Indication (reported in percent throughwall penetration, or %TW) - A signal with an unequivocal phase angle measurable at 400 kHz, confirmed at 100 kHz. Industry practice is to use a threshold voltage, usually about 1 volt, to discriminate between reportable and non-reportable clear indications. As a conservatism, however, all clear indications, regardless of voltage, are reported for disposition.

- o Distorted Indication (DI) - A signal visible at 400 kHz believed by the interpreter to represent tube degradation, but with an unquantifiable phase angle; expected correlation in mixed frequencies or other single frequencies is not necessarily present.

- o Squirrel (SQR) - A particular type of distorted indication in the tubesheet crevice region whose signal trace at 400 kHz is complex, with an unquantifiable phase angle; these indications have historically been shown to compromise tube wall integrity.

- o Undefined Signal (UDS) - An anomalous signal, not necessarily indicative of tube degradation, but which the interpreter believes should be noted for consideration and disposition.

- o No Detectable Degradation (NDD) - A signal with no evidence of tube wall degradation; either there is no degradation or it is below the detection threshold.

3.2 Tube Plugging Criteria

Tube plugging criteria used during these inspections were basically the same as those used during the March 1987 inspections, including conservatism for indications at tube support plate intersections, as noted below. The following is a brief summary of the plugging criteria implemented for secondary side corrosion in each of the three areas of concern:

- o Tubesheet crevice region, hot leg - All clear indications, DIs, SQRs, and UDSs in the tubesheet crevice region (from the tubesheet roll transition to the secondary face of the tubesheet) are considered pluggable, regardless of voltage or phase angle.

- o Tubesheet surface region, hot leg - All clear indications, DIs, SQRs, and UDSs in the tubesheet surface region (from the secondary face of the tubesheet up to about 6 inches into the free span of tubing) are considered pluggable, regardless of voltage or phase angle.

- o Tube support plate intersection, hot leg - Clear indications meeting a threshold voltage of 1.75 volts and having an indicated throughwall penetration of $\geq$40 percent are considered pluggable. In addition, some indications not meeting the voltage threshold are plugged on phase angle alone based on recommendations of the data interpreter. This added conservatism was initiated during the March 1987 inspection.

The Technical Specification plugging criteria of $\geq$40 percent throughwall penetration was applied to all other areas of the steam generator tubing.

3.3 Eddy Current Inspection Results

Application of the above eddy current analysis criteria/tube plugging criteria resulted in the plugging of 60 tubes because of secondary side corrosion and 18 tubes because of primary side indications at the tubesheet roll transition. Table 2 gives a breakdown of the number of tubes with hot leg secondary side eddy current indications and the number of tubes that were plugged.

Points of interest in the inspection results, as noted by the licensee, include the following.

TABLE 2

INDICATIONS OF HOT LEG SECONDARY SIDE CORROSION
SEPTEMBER 1987 EDDY CURRENT INSPECTIONS

A. Including only the most significant indication per tube, total for all 4 steam generators.

	<40%	≥40%	DI	UDS	SQR	Total
Tubesheet Crevice	0	11	16	1	8	36
Tubesheet Surface	0	4	7	0	--	11
Support Plates	39	13	348	0	--	400
Total	39	28	371	1	8	447

*Tubes inside boundary were plugged

B. Including multiple indications per tube, total for all 4 steam generators.

	<40%	≥40%	DI	UDS	SQR	Total
Tubesheet Crevice	0	11	16	1	8	36
Tubesheet Surface	0	4	8	0	--	12
Support Plates	42	13	470	0	--	525
Total	42	28	494	1	8	573

Reference: AEP:NRC:0936L, dated November 24, 1987

- The number of distorted indications (DIs) reported at tube support plate intersections decreased significantly from the March 1987 inspection results (470 vs. 830). The apparent explanation for the decrease is that the recent signals are "clearer," thus allowing for more definitive interpretation of signals that previously would have been categorized as DIs. The clearer data may be attributed to the removal of deposits by continuing secondary side boric acid treatment.

- The incidence of primary side indications at tubesheet roll transitions (located approximately 18 inches below the secondary face of the tubesheet), first detected in 1986, appears to be slowly progressing, but the progression rate is not of serious concern since the D.C. Cook Unit 2 steam generators will soon be replaced.

As a precaution, all indications regardless of depth were plugged.

3.4 Justification for Operating Interval Length Starting in April 1987

To justify continuing operation for 5.2 EFPMs after startup in October 1987, Indiana and Michigan Electric Power Co. referenced its May 22, 1987 submittal. In the May 22, 1987 submittal, Indiana and Michigan Electric Power Co. documented operating experience through March 1987 and presented detailed justification for safe operation of the D.C. Cook Unit 2 steam generators for 4.7 EFPMs after startup on April 21, 1987. This justification was based on models using Regulatory Guide 1.121 safety evaluations on steam generator tube structural limits for D.C. Cook Unit 2 tubing, general tube degradation growth rates, and a conservative eddy current uncertainty margin.

3.4.1 Regulatory Guide 1.121 Basis

Minimum wall requirements for the D.C. Cook Unit 2 steam generator tubing were calculated in accordance with the criteria of R.G. 1.121,

entitled "Bases for Plugging Degraded PWR Steam Generator Tubes." The basic recommendations of R.G. 1.121 for allowable minimum wall determination are outlined below.

1. For normal plant operation, primary tube stresses are limited such that a margin of safety of 3 is provided against exceeding the ultimate tensile stress of the tube material, and the yield strength of the material is not exceeded, considering normal and upset condition loadings.

2. For accident condition loadings, the requirements of paragraph NB-3225 of Section III of the ASME Code are to be met.

   In addition, it must be demonstrated that the applied loads are less than the burst strength of the tubes at operating temperature as determined by testing.

3. For all design transients, the cumulative fatigue usage factor must be less than unity.

Tables 3 and 4 give the calculated R.G. 1.121 D.C. Cook Unit 2 minimum acceptable tube wall requirements and the allowable wall loss determination.

3.4.2 Growth Rate Determinations

Average general growth rates were determined for three areas of interest by comparing eddy current inspection results before and after an operating interval. The 1985-1986 operating interval (at 80% power and with boric acid soaking) was used to develop a general growth rate methodology using metallurgical data from tube samples removed during the 1985 outage and a number of non-pluggable indications that were left in service and given an opportunity to grow during the 1985-1986 interval. Table 5 summarizes the general growth rates established for the three areas of interest in the tube bundle.

TABLE 3

COOK 2 STEAM GENERATOR TUBING
MINIMUM ACCEPTABLE WALL REQUIREMENTS

A. Tubesheet crevice and tubesheet surface regions.

Criteria	Condition	Minimum Wall (inches)
Yield	normal	0.015
ASME Code	faulted	0.017
Su/3	normal	0.019

B. Tube support plate intersections.

Criteria	Condition	Minimum Wall (inches)
Yield	normal	0.012
ASME Code	faulted	0.013
Su/3	normal	0.015

Reference: Attachment 1 to AEP:NRC:0936J, dated May 18, 1987

TABLE 4

COOK 2 STEAM GENERATOR TUBING
ALLOWABLE WALL LOSS DETERMINATIONS

Location	Geometric Condition	Basis	Allowable Wall Loss (%)
Tubesheet Crevice Region	Axial extent >1.5 inches	Su/3	62
Tubesheet Surface Region	Axial extent >1.5 inches	Su/3	62
Tube Support Plate Intersections	Axial extent ≤0.75 inches	Su/3	70

Reference: Attachment 1 to AEP:NRC:0936J, dated May 18, 1987

TABLE 5

1985 to 1986 INTERVAL IGA/SCC GROWTH RATES

Location	Mean Growth Rate (percent EFPM)	Sample Size
Tubesheet Crevice Region	1.60	19
Tubesheet Surface Region	0.82	18
Tube Support Plate Intersections	0.66	38

Reference: Attachment 1 to AEP:NRC:0936J, dated May 18, 1987

3.4.3 Eddy Current Testing Uncertainty

By comparing actual laboratory results of tube wall penetration to *in situ* eddy current inspection results, the licensee found that the *in situ* eddy current tests yield a maximum under-prediction of 16 percent for tubes with throughwall penetration of up to 40 percent. As wall penetration gets deeper, the eddy current tests more closely predict the actual depth of penetration. Indiana and Michigan Electric Power Company has therefore established a 16 percent eddy current testing uncertainty to evaluate operating interval length.

3.4.4 Operating Interval Determination

On the basis of R.G. 1.121 criteria for tube structural limits, general tube degradation growth rates, and a conservative eddy current uncertainty margin, Indiana and Michigan Electric Power Co. concluded that 8.0 EFPMs was an appropriate length for an operating interval, measured from return to power in April 1987. These findings are summarized in Table 6.

In the interest of further conservatism, Indiana and Michigan Electric Power Co. requested a 4.7 EFPM operating interval starting in April 1987 before removal of D.C. Cook Unit 2 from service to verify and restore as necessary the integrity of the steam generator tube bundles.

3.5 Justification for Operating Interval Length Starting in October 1987

Based on the September 1987 inspection results, Indiana and Michigan Electric Power Co. concluded that the models used in predicting tube degradation rates are conservative or that actual tube degradation rates have been reduced as a result of corrective measures. Indiana and Michigan Electric Power Co. cites the data summarized in Table 7, which compares the projected condition vs. actual pluggable indications from the 3.0 EFPM operation interval between the April 1987 and September 1987 inspections.

Overall, the actual number of pluggable indications was nearly 50 percent less than predicted by the models used. Indiana and Michigan

TABLE 6

OPERATING INTERVAL JUSTIFICATION
STARTING APRIL 1987 - R.G. 1.121 BASIS

Item	Tubesheet Crevice	Tubesheet Surface	Tube Support Plates
Allowable tube wall loss (%)	62	62	70
ECT uncertainty (%)	16	16	16
Growth (%/EFPM)	1.6	0.82	0.66
Projected growth (%/8.0EFPM)	12.8	6.6	5.3
Plugging level required (%)	33.2	39.4	48.7
Plugging level implemented	All	All	≥40.0%

Reference: Attachment 1 to AEP:NRC:0936J, dated May 18, 1987

TABLE 7

PLUGGABLE INDICATIONS COMPARISON

	Tubesheet Crevice	Tubesheet Surface	Tube Support Plates	Total
Projected	75	36	1	112
Actual	36	11	13	60

Reference: AEP:NRC:0936L dated November 24, 1987

Electric Power Co. indicated that in the tubesheet crevice and surface regions, where tube leaks due to secondary side corrosion have occurred, large overpredictions were made. Indiana and Michigan Electric Power Co. contends that underprediction of pluggable indications at tube support locations is likely the result of fewer reported DIs at support plates; that is, clearer data allowed for sizing of some pre-existing flaws that had previously been called DIs.

Indiana and Michigan Electric Power Co. concludes that because of its conservative plugging practices, all indications in the vicinity of the tubesheet have been removed from service and therefore new degradation growth rates cannot be reliably calculated for the tubesheet crevice and surface areas and that the original models will predict conservative end-of-interval conditions. Therefore, in view of the inherent and apparent conservatisms in the original models, an operational interval of 5.2 EFPMs starting in October 1987 represents an insignificant change to the 4.7 EFPM interval previously justified, and is an appropriate operating interval to minimize the potential for significant in-service steam generator tube leakage.

Finally, Indiana and Michigan Electric Power Co. believes that in the unlikely event that extreme tube wall penetration might occur as a random event not predicted by probabilistic analysis, its leak rate monitoring program and the Technical Specification leak rate limit will ensure leak-before-break conditions and that an orderly shutdown can be effected. Indiana and Michigan Electric Power Co. further contends that its administrative policy of shutting down before reaching the actual leak rate limit adds additional margin to leak-before-break considerations.

4. EVALUATION

A review of D.C. Cook Nuclear Plant Unit 2 eddy current inspection results of September 1987, degradation growth model predictions, and documented operating experience has been conducted to assess the probability of excessive in-service steam generator tube leakage during power operation through the end of the current fuel cycle. The primary purpose of this

evaluation is to provide a technical review of the Indiana and Michigan Electric Company justification for the next operating interval and address power operation restrictions and licensee actions resulting from previous inspection results.

The September 1987 inspection results confirm that licensee administrative and remedial maintenance measures have been adequate to ensure safe operating conditions. Reduction of thermal power output to reduce operating temperature, on-line additions of boric acid to inhibit caustic-induced tube corrosion, and other improved secondary chemistry controls have slowed the rate of tube degradation. Pluggable indications in two critical areas that suffer IGA/SCC, the tubesheet crevice region and the tubesheet surface region, were almost 50% less than predicted by the degradation growth models when adjusted to the actual 3.0 EFPMs of operation between the April 1987 and September 1987 inspections, It should be noted, however, that the increase in pluggable indications at tube support plate locations may be attributable to the new operational mode.

The conservative uncertainty margin in the original predictive models, the cautionary plugging practices, which remove from service all clear indications in the vicinity of the tubesheet regardless of voltage or phase angle, and the leak rate monitoring program to verify leak-before-break conditions are effective elements that support the justification presented by Indiana and Michigan Electric Company and minimize the potential for significant in-service steam generator tube leakage. The inspection results also confirm the licensee's contention that the models used to justify operational intervals based on 1985-1986 interval tube degeneration rates, R.G.1.121 tube structural integrity criteria, plugging levels for critical areas, and eddy current test margins are indeed conservative.

5. CONCLUSIONS

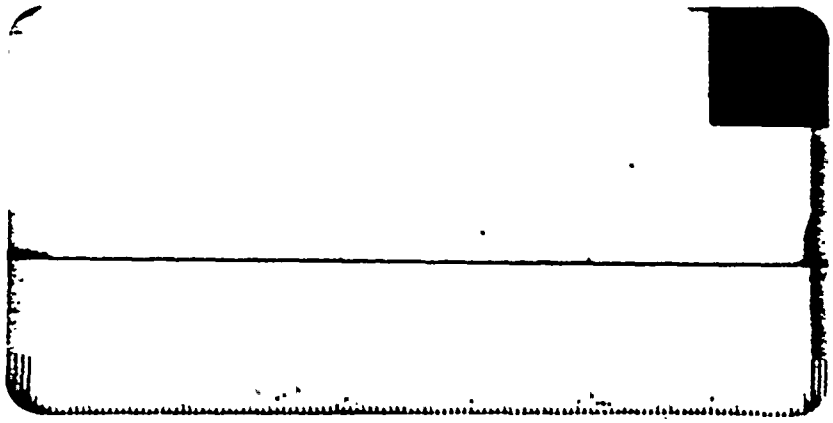
This review and evaluation is based on outage inspections conducted to date by Indiana and Michigan Electric Company, the licensee's letters of May 22, 1987 and November 24, 1987, and the report attached to the May 22, 1987 letter entitled "Steam Generator Tube Integrity, April 1987 -- An Assessment

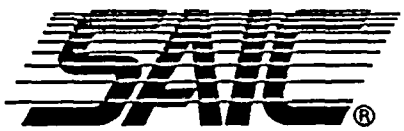
of the Next Operating Interval Length." Conclusions are based upon an analysis of inspection results, tube degradation growth model predictions for safe operation of 8.0 EFPMs between inspections, and extreme or random event probabilities coupled with licensee actions to control degradation, radiation exposure considerations, economic penalties, and a commitment to steam generator replacement plans.

Based upon this evaluation, it has been concluded that D.C. Cook Unit 2 may be operated for 5.2 EFPMs from its October 1987 startup without undue risk to the public health and safety.

However, in view of the increased number of pluggable indications detected in the tube support plate regions, future eddy current inspections, if required, should include an expanded inspection of the tube support regions, into the top support plate region of the cold leg side of the steam generators.

Previously instituted remedial measures and administrative power reduction should be continued to minimize the probability of a forced shutdown due to leakage. Additional margin against random events causing extreme wall penetration is provided by the leak rate monitoring program, the licensee's Technical Specification leak rate limit conditions, and administrative policy of orderly shutdown before reaching actual leak rate limits.





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