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DENTON,H.R. Office of Nuclear Reactor Regulation, Director

SUBJECT: Forwards summary of results gathered during low pressure turbine rotor wheel cracking insp since Jul 1980.

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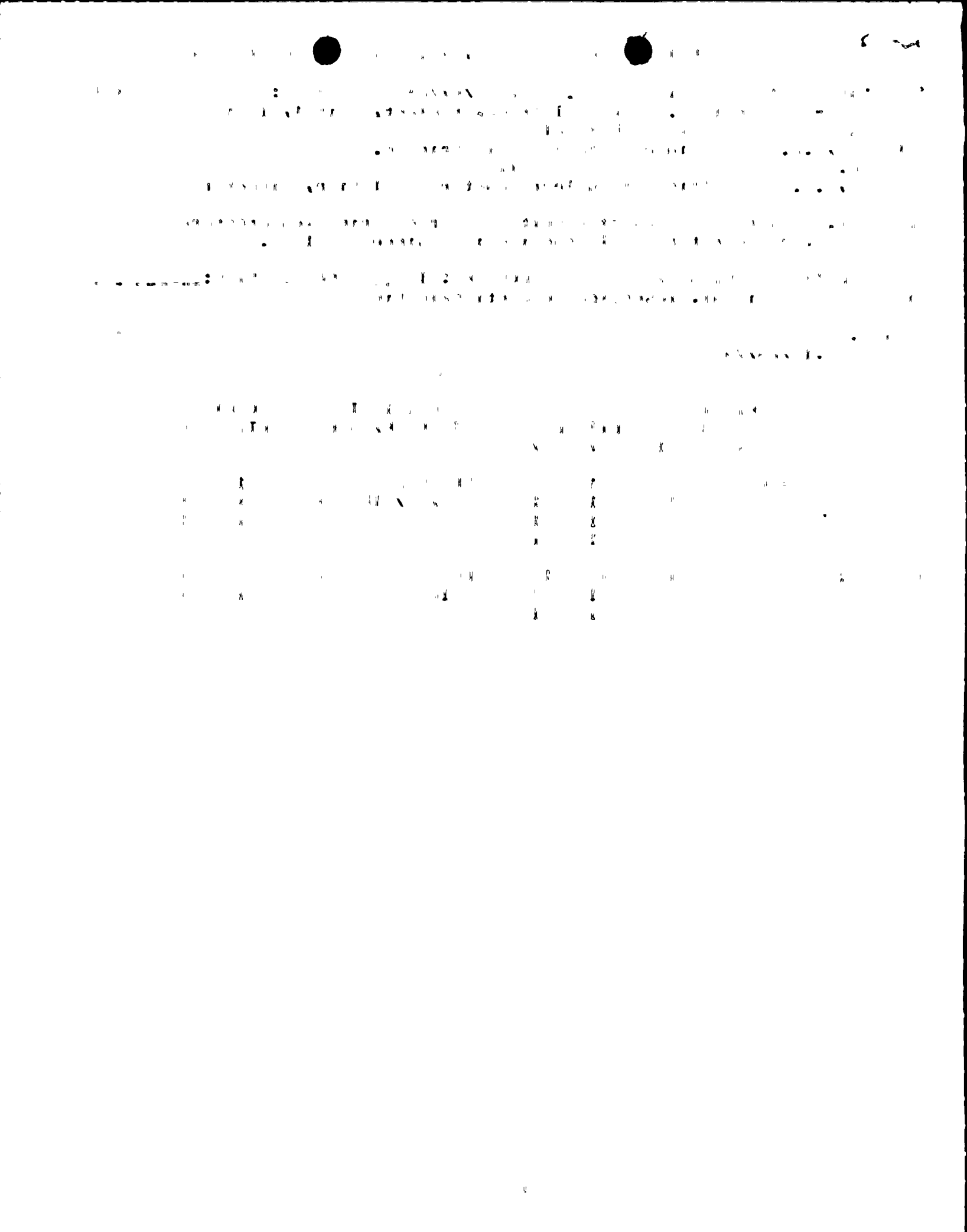

INDIANA & MICHIGAN ELECTRIC COMPANY

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July 23, 1984
AEP:NRC:0344C

Donald C. Cook Nuclear Plant Unit No. 1
Docket No. 50-315
License No. DPR-58
Summary of Low Pressure Turbine
Rotor Inspections

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

This letter provides a summary of results gathered during inspections for wheel cracking on the Low Pressure Turbine Rotors used in the turbine for D. C. Cook Unit 1. The attachment which follows highlights the findings since July, 1980.

This information is provided as a follow-up to Mr. S. A. Varga's letter of September 3, 1981 to Mr. John E. Dolan of the Indiana & Michigan Electric Company.

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
Vice President

7/23/84

MPA/cm

Attachment

cc: John E. Dolan
W. G. Smith, Jr. - Bridgman
R. C. Callen
G. Charnoff
E. R. Swanson - NRC Resident Inspector, Bridgman

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D. C. COOK NUCLEAR PLANT UNIT 1
LOW PRESSURE TURBINE ROTOR INSPECTIONS
ATTACHMENT TO AEP:NRC:0344C

In July 1980, the D. C. Cook Unit 1 Low Pressure (LP) Turbine Rotors A and B were inspected after approximately 35,000 hours of operation. Ultrasonic inspection of the shrunk-on wheel bores revealed shallow indications in the keyways of the fourth stage wheels (turbine and generator ends) of both rotors. Reflectors with no measureable radial depth were also found on the bore surface of six other wheels. The General Electric (GE) inspection summary concluded that water cutting was the source of the keyway ultrasonic indications. GE recommended a reinspection of the A and B rotors after an additional 6 years of operation. This recommended reinspection interval was changed by GE in August of 1982 to 4.5 years after significant wheel keyway stress corrosion cracking was found in a turbine elsewhere in late 1981.

In July 1982, LP Turbine Rotor C was inspected after approximately 48,500 hours of operation. Ultrasonic inspection of the shrunk-on wheel bores revealed a shallow indication in the keyway of the turbine end fourth stage wheel. In evaluating this indication, it was conservatively assumed by GE to be a stress corrosion crack. Also, another wheel contained a bore indication with no measureable radial depth. This analysis resulted in a 4.5 year recommended reinspection interval.

In July 1983, the LP Turbine Rotor B was reinspected after approximately 55,000 hours of operation or some 20,000 operating hours (less than 2.5 operating years) since the initial wheel sonic inspection. This inspection was performed in advance of the recommended reinspection interval to gain additional information on crack growth rates to establish a time table for repair or replacement of the existing rotors.

The results of the July 1983 ultrasonic inspection of the wheel bores revealed crack growth rates in the fourth stage wheel keyways significantly less than the maximum crack growth rate predicted by GE. In addition, new indications were discovered in the fifth stage wheel keyways on both ends of the rotor, and on the sixth stage generator end wheel keyway. Bore surface indications with no measureable radial depth were found on five wheels. GE recommended a reinspection of the B LP Rotor after an additional 4.5 years of operation.

In the inspections performed to date all indications have been confined to the bore/keyway surfaces. Indications found on the bore surfaces away from the keyways have been assessed to be very shallow score marks where no radial depth could be determined. No indications of stress corrosion cracking have been observed on any other wheel surface.

A spare LP turbine rotor is being purchased for interchangeable use in LP A, B or C. The overall plan is to sequentially inspect the three operating LP rotors within the GE recommended reinspection intervals, and replace or repair, as required.