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ALEXICH, M. P. Indiana & Michigan Electric Co.
RECIP. NAME RECIPIENT AFFILIATION
MURLEY, T. E. NRC - No Detailed Affiliation Given

SUBJECT: Informs of util intent to change design of lower tie plate in fuel assemblies. Advanced Nuclear Fuels Corp fuel assemblies will be installed during Cycle 2 reload. Assemblies incorporate debris-resistant tie plate.

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September 14, 1987
AEP:NRC:1035

Donald C. Cook Nuclear Plant Unit 2
Docket No. 50-316
License No. DPR-74
UNIT 2 CYCLE 7 RELOAD: CHANGES TO LOWER
TIE PLATE DESIGN

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

Attn: T. E. Murley

Dear Dr. Murley:

The purpose of this letter is to inform you of our intent to make a change to the design of the lower tie plate in the fuel assemblies which will be fabricated by Advanced Nuclear Fuels Corporation (ANF) for the upcoming D. C. Cook Unit 2 Cycle 7 reload. D. C. Cook Unit 2 Cycle 7 is scheduled to begin operation in June 1989. The reload will consist of 80 assemblies supplied by ANF. The assemblies will incorporate a debris-resistant lower tie plate in the fuel assembly design to provide protection for the assemblies in the unlikely event that debris is present in the primary coolant system. The new lower tie plate is specifically designed to entrap debris of the size which would be expected to become entrapped in the fuel assembly spacers. Unit 2 Cycle 7 will be preceded by an extended outage to replace all four steam generators. Although extreme caution will be exercised during this outage to prevent debris from entering the primary coolant system, the revised lower tie plate design is considered additional protection against fuel damage.

A safety review of the revised lower tie plate design has been performed by ANF and is included as an attachment to this letter. This review concluded that the revised design does not constitute an unreviewed safety question as defined in 10 CFR 50.59. This conclusion was based on pressure drop data obtained experimentally by ANF. These experiments demonstrated that the pressure drop for the revised lower tie plate design was less than 0.5% higher than the present design. This difference was considered exceedingly small and is bounded by the assumptions of the current D. C. Cook Unit 2 Cycle 6 safety analyses performed by ANF.

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Since the D. C. Cook Unit 2 Cycle 7 reload will be very similar to the present Cycle 6 reload, the current plans for Cycle 7 are to review the reload in house under the provisions of 10 CFR 50.59, rather than seek formal NRC review. Since the safety review of the revised lower tie plate design concluded that there are no unreviewed safety questions associated with the design change, the plans to review the reload under the provisions of 10 CFR 50.59 are unaltered. However, because the Cycle 7 fuel will differ in design from that previously reviewed by the NRC, we have decided as a courtesy to inform you of the change and to solicit your comments. As stated above, the 10 CFR 50.59 safety evaluation performed by ANF is attached to this letter; in addition, ANF has transmitted to you, via their letter DAA:014:87, dated August 25, 1987, a copy of their report ANF-87-91, "D. C. Cook 2 Debris-Resistant Lower Tie Plate Pressure Drop Test Report."

ANF is scheduled to begin fabrication of the Cycle 7 reload fuel by October 13, 1987. Therefore, we request that you inform us of any comments you have on the new lower tie plate design by September 30, 1987, so that we do not risk disruption of the fabrication schedule.

Pursuant to the requirements of 10 CFR 170.12(c), we have enclosed an application fee of $150.00.

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

Very truly yours,

M. P. Alexich
Vice President

cm

Attachment

cc: John E. Dolan
W. G. Smith, Jr. - Bridgman
G. Bruchmann
R. C. Callen
G. Charnoff
NRC Resident Inspector - Bridgman
A. B. Davis - Region III

Attachment to AEP:NRC:1035

Advanced Nuclear Fuels Safety Evaluation of
Revised Lower Tie Plate Design

ADVANCED NUCLEAR FUELS CORPORATION

2101 HORN RAPIDS ROAD, PO BOX 130, RICHLAND, WA 99352-0130
(509) 375-8100 TELEX: 15-2878

FUEL ENGINEERING & TECHNICAL SERVICES

July 30, 1987
ANF-AEP/0597

Indiana & Michigan Electric Company
c/o Mr. Thomas Georgantis
Engineer, Nuclear Materials & Fuel Management
American Electric Power Service Corp.
One Riverside Plaza, 20th Floor
Columbus, OH 43216-6631

Reference: ANF-87-91(P), "Debris-Resistant Lower Tie Plate Pressure Drop Test Report," Advanced Nuclear Fuels Corp., July 1987

Dear Mr. Georgantis:

At AEP's request, Advanced Nuclear Fuels (ANF) has incorporated a debris-resistant lower tie plate (LTP) in the fuel assembly design as a precaution against the unlikely event of debris being present in the primary coolant system. The debris-resistant LTP has been designed to reduce the possibility of debris entering the fueled region of the fuel assembly from the primary coolant system. Specifically, it is designed to entrap debris of the size which would be expected to become entrapped in the fuel assembly spacers. This is an improvement over the current LTP design in that it will aid in the prevention of fuel rod failures associated with debris becoming entrapped in the fuel assembly spacers and producing failures due to fretting. Further, entrapping debris in the LTP instead of in a spacer will provide more time for the flow to recover due to cross flow affects before reaching the MDNBR region.

A review of the pressure drop information provided in Reference (1) indicates that the unchamfered debris-resistant LTP proposed for D. C. Cook Unit 2 has essentially the same pressure drop as the current LTP. That is, less than a 0.5% difference was observed in the test data obtained between the current LTP and the prcposed unchamfered debris-resistant LTP. Since this difference is exceedingly small, it will produce only a very minor inlet flow perturbation. This minor inlet flow perturbation would be expected to disappear due to cross flow effects prior to reaching the axial location at which MDNBR would occur. Further, the current MDNBR analysis performed for D. C. Cook Unit 2 assumed a 5% inlet flow maldistribution for the hot channel which is significantly larger than the inlet flow maldistribution which would be expected from the LTP change. Based on this, it is concluded that the Cycle 6 safety analysis will cover the plant conditions expected to occur as a result of the LTP change.

Thus, Advanced Nuclear Fuels (ANF) has concluded that the results presented in the Cycle 6 Disposition of Events and safety analysis reports are not affected by the change in LTP and that these reports will remain applicable to future

cycles with the unchamfered debris-resistant LTP. Consequently, ANF concludes that the substitution of the unchamfered debris-resistant LTP for the current D. C. Cook Unit 2 LTP:

(1) Does not involve a significant increase in the probability of occurrence or the consequences of an accident previously evaluated in the safety analysis report.

(2) Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report.

(3) Does not involve a significant reduction in the margin of safety as defined in the bases for the technical specifications.

Therefore, ANF concludes that the substitution of the unchamfered debris-resistant LTP for the current LTP does not involve an unreviewed safety issue as defined in 10 CFR 50.59. No additional analyses are required in support of this finding.

If you have any questions or comments regarding the above, please feel free to contact us.

Sincerely,

Gary N. Ward, Manager
Reload Licensing

cc : J. M. Cleveland
D. H. Malin
V. VanderBurg