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 RECIP. NAME                      RECIPIENT AFFILIATION  
 DENTON, H. R.                      Office of Nuclear Reactor Regulation, Director (post 851125)

SUBJECT: Application to amend Licenses DPR-58 & DPR-74, modifying Tech Spec 5.3.1 to delete ref to max U weight per assembly & to correct minor editorial changes. Fee paid.

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DEPARTMENT OF CHEMISTRY  
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TO: THE DIRECTOR, NATIONAL BUREAU OF STANDARDS  
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WASHINGTON, D.C. 20535

FROM: DR. J. H. GOLDSTEIN, CHICAGO  
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Run	Temp. (°C)	Time (hr)	Conversion (%)	Notes
1	50	1	10	
2	50	2	20	
3	50	4	40	
4	50	8	70	
5	50	16	90	
6	50	32	95	
7	50	64	98	
8	50	128	99	
9	50	256	100	
10	50	512	100	
11	50	1024	100	
12	50	2048	100	
13	50	4096	100	
14	50	8192	100	
15	50	16384	100	
16	50	32768	100	
17	50	65536	100	
18	50	131072	100	
19	50	262144	100	
20	50	524288	100	
21	50	1048576	100	
22	50	2097152	100	
23	50	4194304	100	
24	50	8388608	100	
25	50	16777216	100	
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49	50	281474976710656	100	
50	50	562949953421312	100	

# INDIANA & MICHIGAN ELECTRIC COMPANY

P.O. BOX 16631  
COLUMBUS, OHIO 43216

December 22, 1986  
AEP:NRC:1016

Donald C. Cook Nuclear Plant Unit Nos. 1 and 2  
Docket Nos. 50-315 and 50-316  
License Nos. DPR-58 and DPR-74  
FUEL ASSEMBLY URANIUM MASS  
TECHNICAL SPECIFICATION CHANGE

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

Dear Mr. Denton:

This letter and its attachments constitute an application for amendment to the Technical Specifications (T/Ss) for the Donald C. Cook Nuclear Plant Unit Nos. 1 and 2. Specifically, we propose to modify T/S 5.3.1 (Design Features - Reactor Core Fuel Assemblies) to delete reference to a maximum uranium weight per assembly and to correct minor editorial changes. The reasons for the proposed changes and our analyses concerning significant hazards considerations are contained in Attachment 1 to this letter. The proposed revised T/S pages are contained in Attachment 2.

We believe that the proposed changes will not result in (1) a significant change in the types of effluents or a significant increase in the amounts of any effluent that may be released offsite, or (2) a significant increase in individual or cumulative occupational radiation exposure.

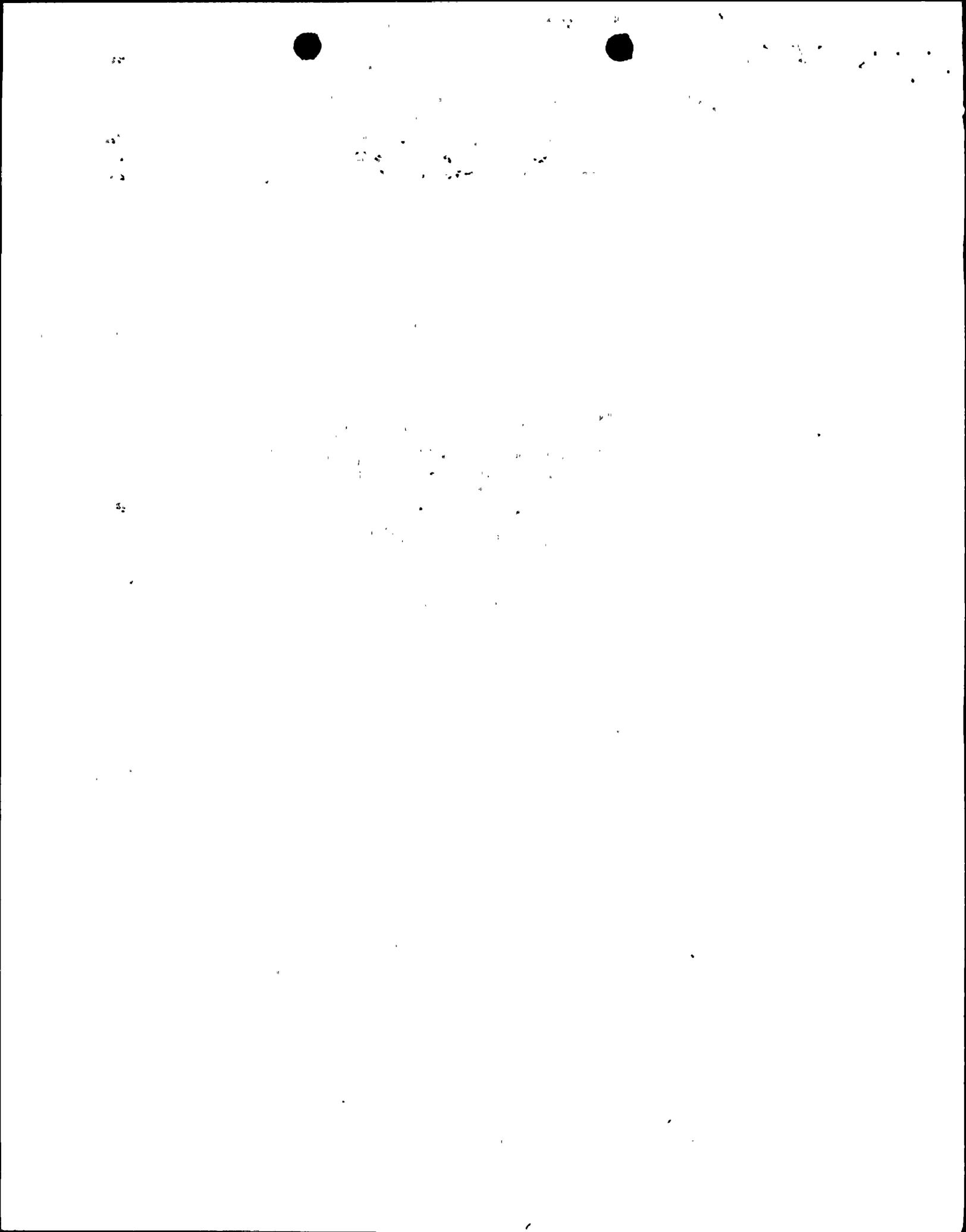
These proposed changes have been reviewed by the Plant Nuclear Safety Review Committee (PNSRC) and will be reviewed by the Nuclear Safety and Design Review Committee (NSDRC) at their next regularly scheduled meeting.

In compliance with the requirements of 10 CFR 50.91(b)(1), copies of this letter and its attachments have been transmitted to Mr. R. C. Callen of the Michigan Public Service Commission and Mr. G. Bruchmann of the Michigan Department of Public Health.

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

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Very truly yours,



M. P. Alexich  
Vice President

*RBK*  
*12/19/86*

MPA/cm

Attachments

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

Attachment 1 to AEP:NRC:1016

Reasons and 10 CFR 50.92  
Analyses for Changes to the  
Donald C. Cook Nuclear Plant Unit Nos. 1 and 2  
Technical Specifications

This license amendment request proposes to modify T/S 5.3.1 (Design Features - Reactor Core Fuel Assemblies) for Units 1 and 2 to delete reference to a maximum uranium weight per assembly.

#### Background

By letter dated September 4, 1986 (Attachment 3), Westinghouse Electric Corporation (Westinghouse) officially notified us of a discrepancy involving the maximum uranium weight per assembly specified in T/S 5.3.1 for Unit 1. Specifically, Westinghouse informed us that recent improvements to their fuel design (including chamfered pellets with a reduced dish and a nominal density increase) have increased fuel weight slightly. The weight increases have caused the maximum fuel rod weight to exceed the maximum value of 2236 grams specified in Unit 1 Design Features T/S 5.3.1. Westinghouse also provided us with proposed wording and justification for a T/S change, as well as a justification for continued operation. Westinghouse had notified us of the condition informally in April of this year. At that time, the issue was discussed with your staff, who informed us the issue could be resolved by submitting revised T/Ss.

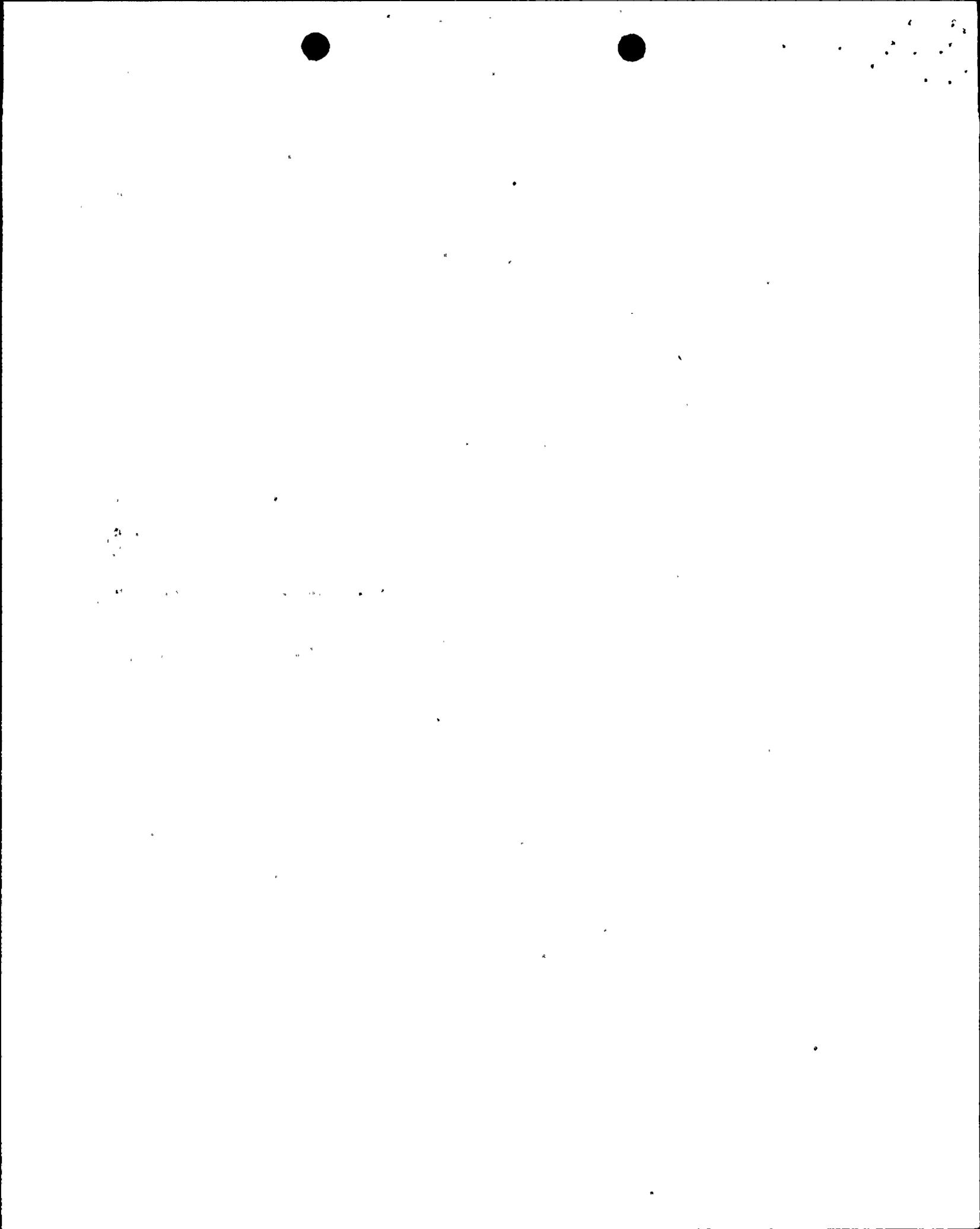
The applicability of this issue to Unit 2 of the D. C. Cook Plant was discussed with Exxon Nuclear Company (ENC), our Unit 2 fuel supplier. Although the ENC fuel in Unit 2 does not exceed the maximum uranium weight per rod specified in Unit 2 T/S 5.3.1, ENC informed us by letter dated October 15, 1986 (Attachment 4) that they "concur with the generic Westinghouse evaluation of the proposed removal of the maximum rod weight from T/S 5.3.1."

#### Evaluation

The proposed change of Technical Specification Design Features Section 5.3.1 is given in Attachment 2. This is the only reference to fuel rod uranium weight in the Technical Specifications.

As described by Westinghouse in Attachment 3,

Although a number of safety analyses are affected indirectly by fuel weight, the analyses are more sensitive to fuel configuration, length, enrichment and physical design which are also specified in the plant Technical Specifications. The Technical Specifications limit power and power distribution, thus controlling the fission rate and the rate of decay heat production. Fuel rod weight does not have any direct bearing on the power limits, power operating level, or decay heat rate. The composition of the fuel is closely monitored to assure acceptable fuel performance. The fuel weight changes that could be made without a Technical Specification limit are not of sufficient magnitude to cause a significant difference in fuel performance as analyzed by Westinghouse. There are no expected observable changes in normal operation due to the noted fuel rod weight changes, and the remaining fuel parameters listed in the Technical Specifications are considered in the Reload Safety Evaluation.



Other Design Basis Events were examined to assess the effects of possible changes in fuel rod weight. Fuel rod weight will only change as a result of a specific change in the physical design, which is addressed in the Reload Safety Evaluation, or within the manufacturing tolerances, in which case the changes in fuel rod weight are relatively insignificant. Changes in nuclear design resulting from fuel rod weight changes are controlled as discussed above. For these changes, the effect on new and spent fuel criticality and fuel-handling analyses remain bounded by the existing analyses and Technical Specification Design Feature limits. Fuel-handling equipment and procedures are not affected by these weight changes. Seismic/LOCA analyses contain sufficient conservatism to bound these weight changes. Other accident analyses are not affected by rod weight as a direct parameter, and the existing analyses remain bounding.

As stated earlier, ENC has (in Attachment 4) concurred with the Westinghouse evaluation with regard to D. C. Cook Unit 2.

#### Basis for No Significant Hazards Determination

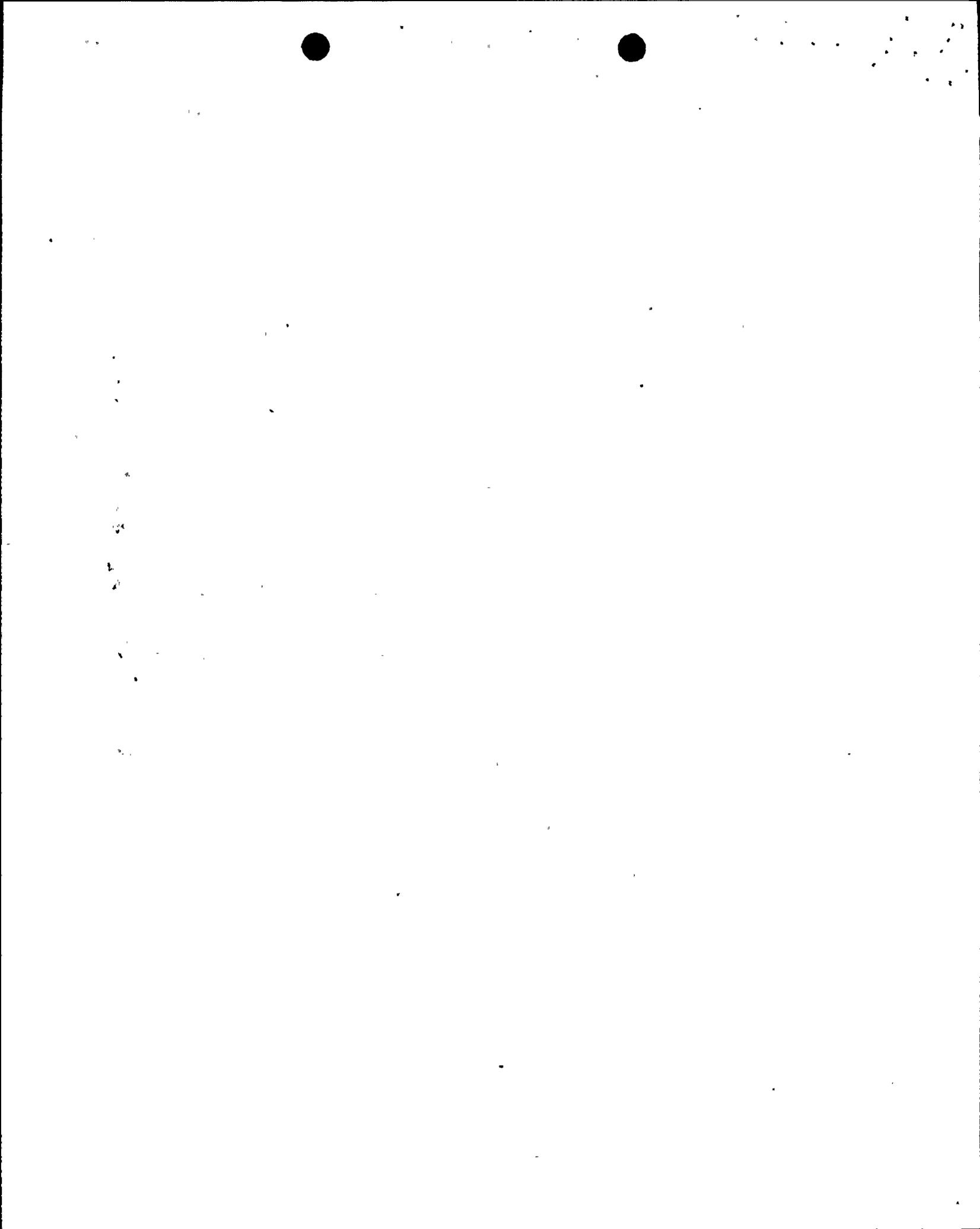
Per 10 CFR 50.92, a proposed amendment will involve a no significant hazards consideration if the proposed amendment does not:

- (1) involve a significant increase in the probability or consequences of an accident previously evaluated,
- (2) create the possibility of a new or different kind of accident from any accident previously analyzed or evaluated, or
- (3) involve a significant reduction in a margin of safety.

Our evaluation of the above criteria is based on information supplied to us by Westinghouse (see Attachment 3).

#### Criterion 1

The deletion of the fuel rod uranium weight limit does not significantly increase the probability or consequences of previously evaluated accidents. The variation in fuel rod weight that can occur even without a Technical Specification limit is small based on other fuel design constraints, e.g., rod diameter, gap size, UO-2 density and active fuel length, all of which provide some limit on the variation in rod weight. The current safety analyses are not based directly on fuel rod weight, but rather on design parameters such as power and fuel dimensions. These parameters are either (1) not affected at all by fuel rod weight, or (2) are only slightly affected. However, a review of design parameters which may be affected indicates that a change in fuel weight does not cause other design parameters to exceed the values assumed in the various safety analyses, or to cause acceptance criteria to be exceeded. The effects are not significant with respect to measured nuclear parameters (power, power distribution, nuclear coefficients), i.e., they remain within their T/S limits. Thus, it is concluded that the T/S modification does not involve a significant increase in the probability or consequences of a previously evaluated accident.



Criterion 2

The creation of a new or different kind of accident from any previously evaluated accident is not considered a possibility. All of the fuel contained in the fuel rod is similar to and designed to function similar to previous fuel. Thus, the existing new and spent fuel storage criticality analyses bound the changes observed. This change is considered as administrative in nature and does not create the possibility of a new or different kind of accident.

Criterion 3

The margin of safety is maintained by adherence to other fuel-related Technical Specification limits and the FSAR design bases. The deletion of fuel rod weight limits in the Technical Specifications Design Features Section 5.3.1 does not directly affect any safety system or the safety limits, and therefore will not reduce the margin of safety.

Lastly, we note that the NRC has provided guidance concerning the determination of significant hazards by providing certain examples (48 FR 14870) of amendments considered not likely to involve significant hazards consideration. The sixth of these examples refers to changes which may result in some increase to the probability of occurrence or consequences of a previously analyzed accident or may reduce in some way a safety margin, but the results of which are within acceptable criteria. Deleting the T/S limit for maximum fuel rod uranium weight may be perceived as reducing margin of safety or increasing the probability or consequences of previously analyzed accidents. However, evaluations of the proposed change performed by Westinghouse and ENC have demonstrated that applicable criteria with regards to nuclear safety would continue to be satisfied.

Additional Changes

In addition to the changes described above, we also made several minor editorial changes to correct typographical errors in the T/S text. Specifically, we corrected the spelling of "Zircaloy-4" in Unit 1 T/S 5.3.1, and the spelling of "control" in Unit 2 T/S 5.3.2. These changes are purely administrative in nature and therefore do not reduce a margin of safety, do not increase the probability or consequences of a previously analyzed accident, and do not introduce the possibility of a new accident. Therefore, we believe that these changes do not involve a significant hazards consideration as defined by 10 CFR 50.92.

Attachment 2 to AEP:NRC:1016

Proposed Revised Technical Specification Pages