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SUBJECT: Application for amend to License DPR-58,revising Tech Specs to reflect results of reactor vessel Capsule U analysis.

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Donald C. Cook Nuclear Plant Unit 1
Docket No. 50-315
License No. DPR-58
TECHNICAL SPECIFICATION CHANGE REQUEST
REVISED HEATUP AND COOLDOWN, AND LTOP SETPOINT FOR THE
FIRST 32 EFFECTIVE FULL POWER YEARS

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

Attn: T. E. Murley

October 29, 1990

Dear Mr. Murley:

This letter and its attachments constitute an application for a technical specification (T/S) change for Donald C. Cook Nuclear Plant Unit 1. Specifically, we request that the heatup and cooldown curves, and the low temperature overpressurization protection (LTOP) setpoint be revised to reflect the results of Unit 1 reactor vessel Capsule U analysis, Westinghouse report No. WCAP-12483 (submitted in our letter AEP:NRC:0894M dated June 22, 1990). The heatup and cooldown curves have been developed for the most limiting material up to the first 32 effected full power years (EFPY).

Our evaluation concerning significant hazards considerations are provided in Attachment 1. The proposed revised T/S pages are included in Attachment 2.

We believe that the proposed change 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.

The proposed changes have been reviewed by the Plant Nuclear Safety Review Committee. The Nuclear Safety and Design Review Committee will review these changes at their next regularly scheduled meeting.

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

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

Sincerely,

M. P. Alexich
Vice President

MPA/eh

Attachments

cc: D. H. Williams, Jr.
A. A. Blind - Bridgman
J. R. Padgett
G. Charnoff
NFEM Section Chief
A. B. Davis - Region III
NRC Resident Inspector - Bridgman

ATTACHMENT 1 TO AEP:NRC:08940

REASONS AND 10 CFR 50.92 ANALYSIS FOR

CHANGES TO THE DONALD C. COOK NUCLEAR PLANT

UNIT 1 TECHNICAL SPECIFICATIONS

Introduction

The revised T/S heatup and cooldown curves, and LTOP setpoint were developed based upon the results of the reactor vessel Capsule U analysis reported in the Westinghouse report No. WCAP-12483, as per the requirements of Reg Guide 1.99, Rev. 2 (submitted in our letter AEP:NRC:0894M dated June 22, 1990). That analysis determined that the limiting reactor vessel material is no longer the weld metal but the base metal (intermediate shell plate B4406-3), with a copper and nickel content of .15% and .49%, respectively. Also, the current T/S heatup and cooldown curves were prepared considering the most limiting value of the predicted adjusted reference temperature at the end of 12 EFPY. This revision to the T/S heatup and cooldown curves has considered 32 EFPY.

As noted above, the reactor vessel Capsule U analysis determined that the base metal is now more limiting than the weld metal. Therefore, we are requesting that the following pages be revised to reflect the new limiting reactor vessel material, and to reflect the recalculated LTOP temperature setpoint based on 32 EFPY: 3/4 1-11, 3/4 1-11a, 3/4 4-3, 3/4 4-31, 3/4 5-7, 3/4 5-8, B 3/4 1-2, B 3/4 4-1, B 3/4 4-6, B 3/4 4-7, and B 3/4 5-2.

T/S pages 3/4 4-27 and 3/4 4-28 contain T/S Figures 3.4-2 and 3.4-3, the heatup and cooldown curves, which have been revised to reflect the results of the Capsule U analysis contained in WCAP-12483.

We are also requesting an editorial change to obtain consistency throughout the technical specifications. Specifically, we request that the maximum heatup rate be changed from 100°F/hr. to 60°F/hr. in T/S 3.4.9.1.a on T/S page 3/4 4-25. This revision will make the subject specification consistent with the heatup rate currently specified by our heatup curve contained on T/S page 3/4 4-27, and will remain consistent with the above described revision to that curve.

Justification for Request and Significant Hazards Considerations

We believe that operating with the revised heatup and cooldown curves and revised LTOP setpoint will not adversely impact public health and safety.

10 CFR 50.92 Criteria

Per 10 CFR 50.92, a proposed amendment will not involve a significant hazards consideration if the proposed amendment does not:

1) involve a significant increase in the probability or consequences of an accident previously analyzed,

2) create the possibility of a new or different kind of accident from an accident previously analyzed or evaluated, or

3) involve a significant reduction in a margin of safety.

Our evaluation of the proposed change with respect to these criteria is provided below.

Criterion 1

Heatup and cooldown limit curves are calculated using the most limiting value of the reference nil-ductility temperature (RT_{NDT}) for the reactor vessel. Previously RT_{NDT} was dependent on the phosphorous and copper content. With the issuance of Regulatory Guide 1.99, Rev. 2, the phosphorous content no longer needs to be considered; instead, the nickel content must be considered when calculating the RT_{NDT}. Our reactor vessel Capsule U analysis (WCAP-12483) submitted in our letter AEP:NRC:0894M dated June 22, 1990, provided revised calculated RT_{NDT} values for both the base metal and the weld metal. Table 5-8 of WCAP-12483 shows, for the various surveillance materials, a comparison of the transition temperature (ΔRT_{NDT}) increases seen during the tests to the increases predicted using the methods of NRC Regulatory Guide 1.99, Rev. 2. This comparison shows that, for the plate B-4406-3 material (longitudinally), the transition temperature increase resulting from irradiation to 1.88×10^{19} n/cm^2 is $9^{\circ}F$ greater than that predicted by the guide, which includes a 2 sigma allowance for the shift prediction of $34^{\circ}F$. For the weld metal, the transition temperature increase was $37^{\circ}F$ less than that predicted by the guide. The actual value of the change in the transition temperature is, for the base metal, slightly above the value calculated using the regulatory guide and slightly below for the weld.

The LTOP system provides protection against exceeding the vessel ductility limits, as expressed by the pressure-temperature limits in 10 CFR 50, Appendix G, during cold shutdown, heatup and cooldown operations. As per Generic Letter 88-11, the implementation of Reg. Guide 1.99, Rev. 2 requires that the LTOP setpoints be re-evaluated. We have performed this re-evaluation and calculated the revised LTOP setpoint based on the plant-specific Westinghouse Owners Group methodology and the Unit 1 Capsule U analysis, WCAP-12483. The recalculated LTOP setpoint was determined to be 435 psig for the PORVs, with an enable temperature of 152°F.

Therefore, we have concluded that the above changes represent the application of a small refinement to a previously used calculation model or design method, and should not result in a significant increase in the probability or consequences of an accident previously analyzed.

We have made one editorial change in this submittal. Specifically, on T/S page 3/4 4-25 we are requesting that the maximum heatup rate be changed to be consistent with the heatup rate specified on T/S page 3/4 4-27. This constitutes a purely administrative change to achieve consistency throughout the technical specifications, and therefore should not result in a significant increase in the probability or consequences of an accident previously analyzed.

Criterion 2

The proposed T/S changes concerning the heatup and cooldown curves and LTOP setpoint do not involve any physical modifications to the plant. The changes will involve changes to the plant's operating procedures; however, as noted in Criterion 1, the changes are based on the results of the reactor vessel Capsule U analysis, which followed the latest NRC guidance, Reg. Guide 1.99, Rev. 2. Therefore, we have concluded that the above changes represent the application of a small refinement to a previously used calculation model or design method to conform to a revised NRC regulation and does not create the possibility of a new or different kind of accident from any previously analyzed or evaluated.

Criterion 3

The heatup and cooldown curves and the revised LTOP setpoint were developed based on the results of the reactor vessel Capsule U analysis (WCAP-12483) which was submitted in our letter AEP:NRC:0894M dated June 22, 1990. The new heatup and cooldown curves were also developed using the criterion noted in Reg. Guide 1.99, Rev. 2.

As per the requirements of Generic Letter 88-11, the LTOP setpoints have been re-evaluated and revised as part of implementation of Reg. Guide 1.99 Rev. 2. The LTOP setpoints were revised based on the plant-specific Westinghouse Owners Group methodology and Capsule U analysis.

As noted in Criterion 1, there was a slight change in the NDT temperature of the base metal and the weld metal. However, both materials exhibited an average charpy upper shelf energy greater than 50 ft-lb at 32 EFPY at a fluence of 1.88×10^{19} n/cm^2.

Capsule U received a fluence of 1.88×10^{19} n/cm^2. The calculated cumulative fluence at the vessel inner surface is 1.41×10^{19} n/cm^2 at the end of 32 EFPY.

Lastly, we note that the Commission 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 considerations. The sixth of these examples refers to relief granted for changes resulting from the application of a small refinement of a previously used calculation model or design method. The changes proposed in this submittal are a result of our reactor vessel Capsule U analysis and the implementation of the requirements of Generic letter 88-11 and Regulatory Guide 1.99, Rev. 2 and, therefore, does not involve a significant reduction in the margin of safety. For this reason, we believe the example cited is relevant and conclude that the changes do not involve significant hazards considerations, which is consistent with previous NRC actions on applications of this type.