



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

February 3, 1978

Docket No. 50-263

MEMORANDUM FOR: Don K. Davis, Acting Chief, Operating Reactors Branch#2, DOR

FROM: Richard P. Snaider, Project Manager, Operating Reactors
Branch #2, DOR

SUBJECT: SUMMARY OF MEETING WITH NORTHERN STATES POWER COMPANY
AND GENERAL ELECTRIC COMPANY REGARDING THE PROPOSED
MONTICELLO SPENT FUEL POOL EXPANSION

On Thursday, January 26, 1978, representatives of the Northern States Power Company (NSP) staff and the General Electric Company (GE) staff met with the NRC staff to discuss outstanding items concerning criticality calculations for the proposed expanded spent fuel pool at the Monticello Nuclear Generating Plant. A list of attendees and the slides used during the presentation are enclosed.

The NRC request for a technical specification on uranium loading in new fuel was discussed. It was the NRC contention that this specification supplements the existing requirement to assure that a pool K_{eff} of 0.95 will not be exceeded in the future. The NRC staff expressed concern that an increase in uranium 235 loading increases the uncertainties in the calculations for the maximum K_{eff} in the fuel and that these increased uncertainties should be evaluated by NRC when they occur.


GE and NSP contended that the proposed specification was in fact redundant to the $K_{eff} \leq 0.95$ requirement, and that other parametric variations could also result in K_{eff} increases. GE also noted that the subject of fuel pool criticality impact is reviewed upon any fuel redesign. They specifically referred to the latest GE topical submittal, NEDO-24011. This document discussed a new design 8 x 8 fuel that is due to be used later this year.

After lengthy discussion, the NRC staff concluded that the specification of maximum uranium loading would not be necessary for Monticello. This is partly because of the existing specification limiting K_{eff} to ≤ 0.90 (other plants use 0.95) and partly because of a future Regulatory Guide, presently under NRC staff review, into which the staff will incorporate requirements for submittal of necessary information to allow staff review and assure that the

criticality parameter remains within limits. The NRC staff stressed that this withdrawal of the requirement for augmented specifications applies only to Monticello. The NRC staff review has shown that other plants could indeed, given the right combination of fuel loading, errors, and uncertainties, reach or exceed their specified criticality limits.

The remainder of the discussion dealt with the model used for fuel cell and water gap parameters for criticality calculations in the GE model, especially under eccentric bundle and abnormal pool loading conditions. The NRC staff stated that more information was needed on the actual cell to be used and its dimensions, bias and uncertainty values used in the calculational models, and gap dimensions used in modes to determine criticality under abnormal conditions. NSP and GE committed to provide this information.

Original signed by



Richard P. Snaider, Project Manager
Operating Reactors Branch #2
Division of Operating Reactors

Attachments:

1. Attendance List
2. GE Slides

DISTRIBUTION:

See attached page

OFFICE	ORB#2:DOR	ORB#2:DOR				
SURNAME	RSnaider:nm	DDavis				
DATE	4/2/78	2/3/78				

PPR

MEETING SUMMARY DISTRIBUTION

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NRC PDR

Local PDR

ORB #2 Reading

NRR Reading

B. C. Rusche

E. G. Case

V. Stello

K. R. Goller

D. Eisenhut

T. J. Carter

A. Schwencer

G. Lear

R. Reid

W. Butler

B. Grimes

R. Baer

L. Shao

Project Manager - R. Snaider

Attorney, OELD -

OI&E (3)

R. Diggs

NRC Participants (Major)

R. Fraley, ACRS (16)

T. S. Abernathy, DTIE

J. B. Buchanan

Licensee

B. Morris

J. Gianelli

E. Lantz

R. Stanford

C. Herrington, GE

R. Stirn, GE

P. Henrickson, GE

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my

MONTICELLO SFP MEETING

1/26/78

NRC

R. Snaider
B. Morris
J. Giannelli
E. Lantz
R. Stanford

NSP

M. Voth

GE

C. Herrington
R. Stirn
P. Henrikson

gm U²³⁵, SAFETY LIMIT FOR REACTIVITY

0 PURPOSE TECH SPECS

INTEGRITY RADIOACTIVE MATERIALS BOUNDARY
SETTING ENSURES SAFETY LIMIT NOT REACHED
PRESENT SAFETY LIMIT $K_{\text{EFF}} < .95$

0 REQUIREMENTS TECH SPECS

DIFFERENCES INDIVIDUALLY JUSTIFIED
VARIABLES IDENTIFIED & JUSTIFIED
REFERENCE SAFETY ANALYSIS--EVALUATION
BASIS = DETAILS, FULLY DEVELOPED
LEGAL STATUS -- SAFETY ANALYSIS SUPPORT
RATIONALE FOR BASIS

0 FUEL DESIGN CHANGES

REVIEW -- GENERIC RELOAD FUEL APPLICATION
REACTIVITY OF FUEL IN STORAGE →
SPECIFIC PLANT RELOADS
TECH SPECS NOT PROPER DOCUMENT

0 UNSAFE gm U²³⁵

NOT INDICATE CRITICALITY
CALL ATTENTION AWAY FROM ACTUAL SAFETY PARAMETER
IMPROPER SELECTION OF VARIABLE

WHY THERE ISN'T A NEED FOR PROPOSED TECH. SPEC.

- CURRENT TECH. SPEC. LIMIT OF $k_{\text{EFF}} \leq 0.95$
INCLUDES PROTECTION AGAINST ALL LATTICE
DESIGN CHANGES
- U-235 w/o PER CM OF BUNDLE LENGTH IS JUST
ONE OF MANY DESIGN PARAMETERS AFFECTING
BWR LATTICE REACTIVITY
- RELOAD LTR (NEDO-24011-P) EVALUATES ALL RELOAD
BUNDLE DESIGNS AGAINST FUEL STORAGE REQUIREMENTS
- THE TECH. SPEC. SHOULD PROTECT AGAINST ANY
LATTICE CHANGE, NOT JUST FISSILE FRACTION

DESIGN PARAMETERS WHICH AFFECT BWR LATTICE REACTIVITY

- BUNDLE AVERAGE FISSILE FRACTION
- FUEL ROD DIAMETER
- FUEL ROD PITCH
- WATER RODS
- FUEL PIN ENRICHMENT DISTRIBUTION
- AXIAL ENRICHMENT DISTRIBUTION
- GADOLINIA CONCENTRATION & DISTRIBUTION
- SPACER DESIGN (MATERIAL)
- CLADDING & CHANNEL MATERIAL
- CHANNEL DIMENSIONS

MAXIMUM INFINITE LATTICE REACTIVITY AT 65°C

<u>BUNDLE TYPE</u>	<u>MAXIMUM k_∞</u>	<u>EXPOSURE (GWD/ST)</u>
8D250	1.236	5.0
8D262	1.241	5.0
8D274L	1.238	5.0
8D274H	1.216	7.0
8D219L	1.159	0.0
8D219H	1.119	8.0
8DRL301	1.228	7.0
8DRL282	1.218	7.0
8DRL254	1.220	5.0
8DRL071	.892	3.0

REFERENCE: NEDO-20411

MAXIMUM BUNDLE K_{∞} AS A FUNCTION OF INITIAL GRAMS U-235 AT 65°C

