UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

ELJ
RIII - 8
5/1/79

April 24, 1979

Docket No. 50-346

MEMORANDUM FOR: E. L. Jordan, Assistant Director for Technical Programs, Division of Reactor Operations Inspection, IE

THRU: R. F. ~~Heishman~~, Chief, Reactor Operations and Nuclear ~~Support~~ Branch

FROM: J. F. Streeter, Chief, Nuclear Support Section 1

SUBJECT: INITIAL CORE SELECTIVE LOADING AT DAVIS-BESSE NUCLEAR STATION UNIT 1 (A/I F30400H2)

REFERENCES:
(1) Memorandum from J. F. Streeter to R. Woodruff, dated 7/7/78
(2) Memorandum from E. L. Jordan to J. F. Streeter, dated 3/1/79
(3) Memorandum from J. S. Creswell to J. F. Streeter, dated 3/16/79
(4) IE Report 50-346/78-17, paragraph 8
(5) IE Report 50-346/79-04, paragraph 2
(6) BAW-1420, "Davis-Besse Unit 1 - Fuel Densification Report", dated 9/75
(7) BWT-1467, "Davis-Besse Unit 1 Selective Fuel Loading", dated 2/2/77
(8) Memorandum from P.S. Check to K. Seyfrit, dated 3/28/7~~9~~8

We have reviewed Reference (2) which you sent to us in response to Reference (1). As Reference (3) indicates, the inspector who originally identified the potential problem does not believe Reference (2) is an adequate response to Reference (1) and believes the matter should be reviewed by NRR. The inspector believes NRR needs to give particular attention to determining the effect of Reference (7) on the conclusions NRR reached in Reference (8). Based upon evaluations performed by the licensee and vendor as described in References (4) and (7) and upon the inspector's telephone communications with technical personnel in NRR, I do not believe a safety concern of any consequence exists. However, recognizing the inspector's expertise in the core physics area, I request that this matter be forwarded to NRR for review.

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We have been unable to substantiate some LHGR values used in Paragraph 2 of Reference (2). The average LHGR value of 6.274 KW/ft appears to be based on a design 100% power of 2772 MWt, 12 feet of active fuel, 177 fuel assemblies, and 308 fuel rods per assembly $\left(\frac{2,772,000\ KW}{(177)(208)(12\ feet)} = 6.274\ KW/ft\right)$. However, the average LHGRs given in FSAR Table 4-21 and in Reference (6) are less than that value. If one uses the 6.274 KW/ft value and assumes the plant is operating at the maximum allowable peaking factor of 2.94 at the start of a short term transient such as dropped rod event, at 112% (design overpower condition) power the maximum LHGR would be 20.66 KW/ft. (6.274 KW/ft x 1.12 x 2.94 = 20.66 KW/ft). This is of course unacceptable since 20.66 KW/ft is above the fuel melt LHGR limit for all fuel in the core and some center line fuel melting would result. If one uses the 6.143 KW/ft value given in Reference (6) and the same conditions as before, the maximum LHGR would be 20.23 KW/ft and below the fuel melt LHGR limit for all but 2 of the fuel assemblies in the core. If these 2 assemblies were selectively loaded, as they have been, in minimum peaking areas of the core as recommended in Reference (7), fuel melt LHGR limits would not be expected to result under Condition I or II events. The determination of the proper average LHGR should be a result of the NRR review.

During the NRR evaluation (Reference (8)) of the licensee's evaluation of the dropped rod startup test results, NRR concluded that the licensee's technique in extrapolating the LHGR to full power was acceptable and that use of plant computer values for certain core physics parameters was acceptable. However, RIII followup of this extrapolation technique indicated the technique eliminated conservatisms without a computer test case having been run to demonstrate that the computer was capable of either accurately or conservatively monitoring the core parameters in question. This finding was documented in Reference (5). The NRR Project Manager is presently having this matter reviewed within NRR. Information on this effort is provided for clarity since the inspector has recommended that the NRR conclusions set forth in Reference (8) be reviewed in light of Reference (7).

For your information, copies of References (3), (4), (5) and (8) are enclosed.

J. F. Streeter, Chief
Nuclear Support Section 1

Enclosures: As stated

cc w/o encl:
R. F. Heishman
R. L. Spessard
T. N. Tambling
J. S. Creswell