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October 9, 1979

Docket No. 50-336

Director of Nuclear Reactor Regulation
Attn: Mr. R. Reid, Chief
Operating Reactors Branch #4
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Gentlemen:

Millstone Nuclear Power Station, Unit No. 2
Mitigation of CEA Guide Tube Wear, Cycle 4

The purpose of this letter is to advise the NRC Staff of the status of Northeast Nuclear Energy Company's (NNECO) method for mitigating CEA guide tube wear in fuel supplied by Westinghouse for Cycle 4.

Previously, guide tube wear was prevented by inserting a stainless steel sleeve into the upper portion of the guide and instrumentation tubes. It is NNECO's intention to utilize a Westinghouse sleeve design very similar to that presently in use, during Cycle 4 operation.

The proposed sleeve design is illustrated in Figure 1. The dimensions of the sleeve are 1.025 inch OD by 0.994 inch ID by 21.5 inches long. The ID dimension is identical to the sleeve in operation, and the entire ID has a hard chrome plate applied which serves as a resistance to the wearing action of the control rod. The sleeve design also employs a series of slots and holes which eliminate the possibility of water entrapment in the annulus between the guide tube and the sleeve.

Attachment of the sleeve to the fuel assembly is made by expanding the upper portion of the sleeve into the zircaloy guide tube at two (2) swage groove locations provided in the top nozzle extensions. This method of attachment, illustrated in Figure 2, utilizes existing features present in the fuel design and is an extension of the expansion joint technology presently in use by the vendor.

It is NNECO's intention to document this design together with other supporting information as part of the Basic Safety Report scheduled to be submitted early next year.

As part of a longer range design change to mitigate guide tube wear, NNECO proposes the following inset design, illustrated in Figure 3. The inset design consists of a structural modification made to the fuel assembly guide tubes that is intended to greatly reduce the wearing condition by standing-off

the tip of the control rod from the guide tube wall, thereby reducing the amplitude of rod vibration. These insets are 1.00 inch long by 0.30 inch wide rectangular deformations that reduce the original tube diameter locally from 1.035 inch to 0.980 inch. Four individual insets are located at two axial elevations of the guide tubes.

Results of initial tests performed to date demonstrate that the inset design provides advantages over the existing sleeve design. A four assembly demonstration program utilizing the inset design is planned for Cycle 4. The performance of the insets will be assessed by comparing boroscopic examinations to establish visual wear standards. Inspection techniques and needs will be further evaluated for both the sleeve and inset designs.

NNECO has reviewed the proposed designs and has concluded that they are prudent systematic extensions of current technology and introduce no significantly new features that have not already been demonstrated. The demonstration program planned for Cycle 4 will further substantiate this position.

NNECO is aware of the Staff's interest in the guide tube wear phenomena. Should the Staff have additional concerns to warrant a meeting on this subject, please advise accordingly.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

W. G. Counsil

W. G. Counsil
Vice President

Attachment

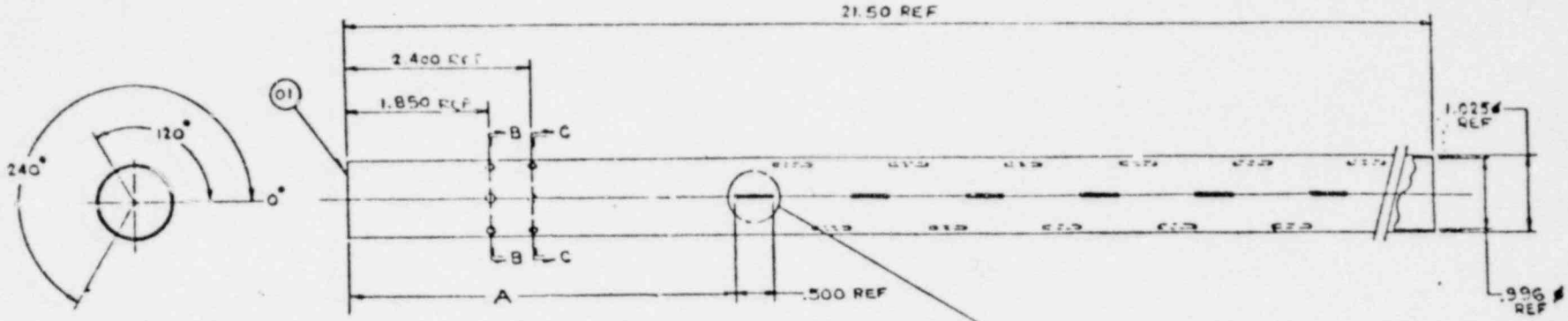
DOCKET NO. 50-336

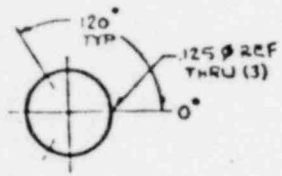
ATTACHMENT

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2

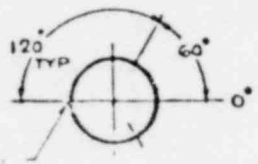
MITIGATION OF CEA GUIDE TUBE WEAR, CYCLE 4

OCTOBER, 1979





SECTION B-B



SECTION C-C

DIM. A	RADIAL LOC.
5.000	0°
5.500	120°
6.000	240°
6.500	0°
7.000	120°
7.500	240°
8.000	0°
8.500	120°
9.000	240°
9.500	0°
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11.000	0°
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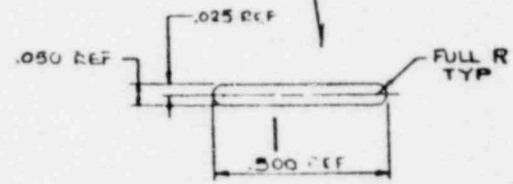
12.000	240°
12.500	0°
13.000	120°



TYP 17 PLACES
SCALE 4:1

FIGURE 1

FIGURE 2

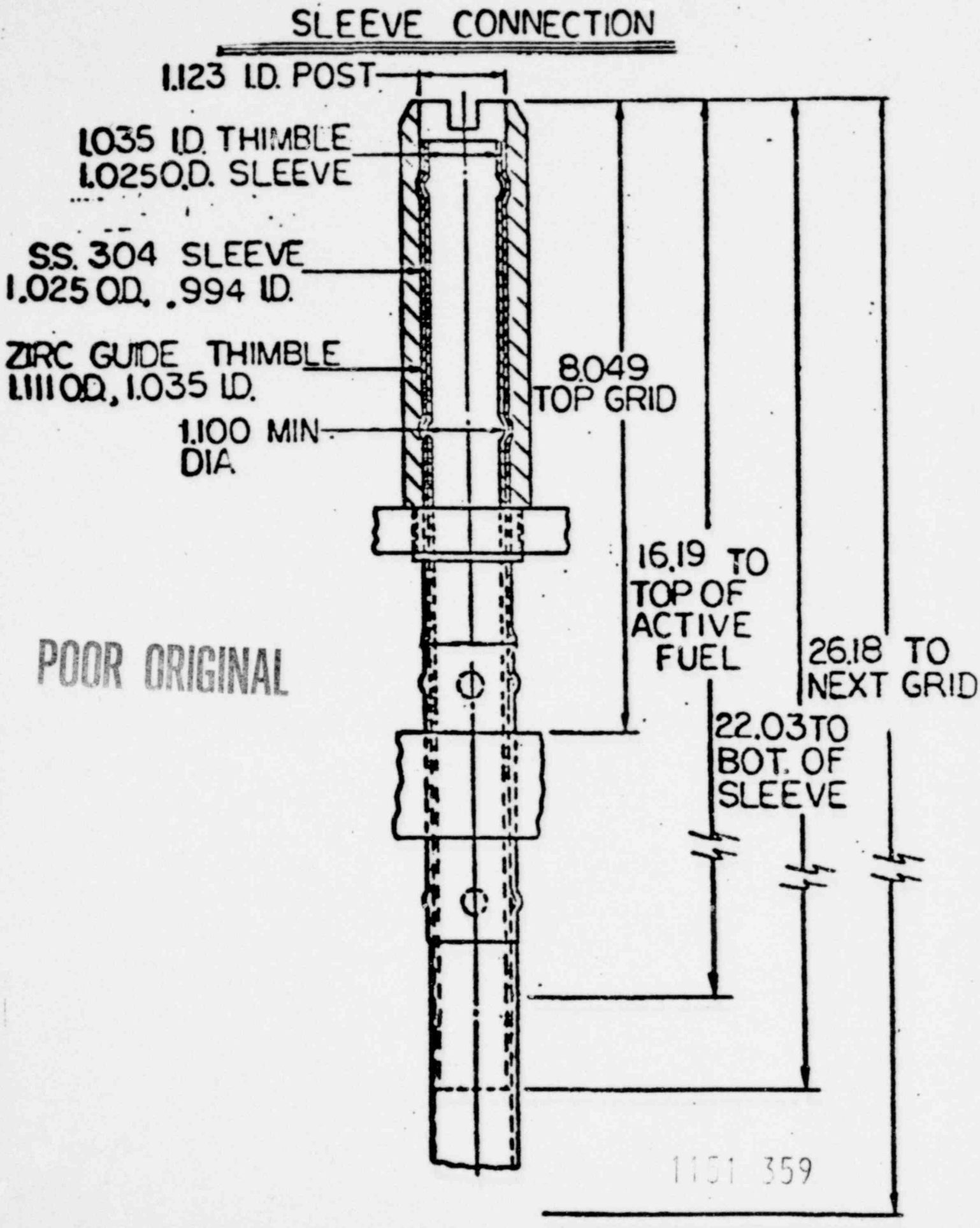


FIGURE 3

THIMBLE/INSTRUMENTATION TUBE INSETS