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Docket No. 50-336
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Director of Nuclear Reactor Regulation
Attn: Mr. Robert A. Clark, Chief
Operating Reactors Branch #3
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Millstone Nuclear Power Station, Unit No. 2
Thermal Shield Concerns

A meeting was held in the NRC Staff's Bethesda offices on April 12, 1983, during which Florida Power and Light (FP&L) presented information regarding the status of the thermal shield at St. Lucie, Unit No. 1. Northeast Nuclear Energy Company (NNECO), as licensee for Millstone Unit No. 2, was requested to attend this meeting due to the generic design similarities common to Millstone and St. Lucie.

At the April 12 meeting, the NRC Staff requested NNECO to provide information to justify continued operation of Millstone Unit No. 2 in light of the material presented by FP&L at the meeting. In response to that request, NNECO hereby provides the following.

Visual examinations within the reactor vessel were conducted during the refueling outage in the fall of 1980. These inspections were conducted primarily in the lower reactor vessel head area, however, inspections of the area between the thermal shield and vessel were also completed. No evidence of thermal shield deterioration or loose parts was identified during these inspections.

No evidence of any loose parts has been identified during the four fuel shuffles conducted to date, the most recent of which was completed in January, 1982.

A refueling outage is currently scheduled to commence on May 28, 1983, during which the ten (10) year in-service inspection (ISI) program will be conducted at Millstone Unit No. 2. These inspections will include the removal of the core support barrel and thermal shield for visual examination. These examinations will include those components of the shield and barrel assembly of concern as identified in the Maine Yankee and St. Lucie thermal shield examinations.

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Instrumentation currently available at the Plant is capable of detecting a significant change in the position of the thermal shield. This would be evident by a change in the neutron flux level measured by the upper and lower excore neutron detector system. A gross failure of the thermal shield support system would also be detected by the operable loose parts monitoring channels located on the steam generator channel heads.

If one postulates a gross failure of the thermal shield support mechanism, existing reactor vessel internal structures would ensure sufficient core flow is maintained. A preliminary assessment by the Millstone Unit No. 2 Nuclear Steam Supply System (NSSS) vendor indicates that the core support barrel snubbers will prevent further downward movement of the shield. In this position, the thermal shield will not result in a significant change in core flow patterns.

Additional components within the reactor vessel, namely the core stops, would act to support the thermal shield if one postulates a thermal shield drop beyond the core support barrel snubber. The core stops have been designed to support the core barrel including the thermal shield, the reactor core and vessel internals in the event of a failure of the core barrel. With the shield supported by the core stops, adequate core flow would be maintained.

Loose parts generated as a result of thermal shield degradation would either settle outside the flow skirt (located below the core support barrel) or, if small enough to pass through the flow skirt orifices, could settle inside the flow skirt. If a loose part were small enough to pass through the flow skirt, be propelled upward and pass through the lower core support plate, limited fuel damage may result due to fretting wear. Technical specifications limiting primary coolant radionuclide activity provide assurance that fuel clad damage from loose part fretting wear is minimal before investigatory actions are initiated to determine the cause of the fuel failure.

The open lattice fuel channel design ensures adequate coolant is available to all fuel rods although localized coolant starvation may result from a loose part small enough to enter a fuel bundle.

Based on the information reviewed to date, NNECO concludes that continued operation of Millstone Unit No. 2 is prudent and justified. No evidence has been identified which indicates thermal shield support deterioration has occurred at Millstone Unit No. 2.

NNECO is currently interacting with the NSSS vendor to develop a program to address the concerns associated with the thermal shield support degradation observed at St. Lucie Unit No. 1. Information obtained from the ongoing recovery efforts at St. Lucie Unit No. 1 will be utilized by NNECO in the development of inspection plans for Millstone Unit No. 2 as well as any program initiated with the NSSS vendor.

We trust you find this information satisfactory.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

W. G. Counsil
Senior Vice President