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The Northeast Utilities System

June 23, 1997
Docket No. 50-336
B16506

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Millstone Nuclear Power Station, Unit No. 2
Continued Operation Without a High Startup Rate Trip

The purpose of this letter is to inform the NRC that Millstone Unit No. 2 will continue operation without a High Startup Rate (SUR) trip. As described in this letter, the original Northeast Nuclear Energy Company (NNECO) request and NRC approval to remove the SUR trip was made without the knowledge that the SUR trip was indirectly credited by Combustion Engineering (CE) for Control Element Assembly (CEA) withdrawal events initiated from subcritical conditions. Given this circumstance, NNECO is enclosing for NRC information, a copy of the Siemens Power Corporation (SPC) Report EMF-97-014, Revision 0, "Millstone Unit 2 Uncontrolled CEA Bank Withdrawal from Subcritical/Startup Analysis," dated February 1997. Based on the review of this analysis, NNECO concludes that the continued operation of Millstone Unit No. 2 without the SUR trip continues to be acceptable as summarized below.

NNECO has previously requested that the NRC approve removal of the SUR trip from the Reactor Protection System (RPS)⁽¹⁾⁽²⁾. NNECO received NRC approval allowing removal of the SUR trip in Amendment 38 to the Technical Specifications

(1) Donald C. Switzer (NNECO) to George Lear (USNRC), "Millstone Nuclear Power Station, Unit No. 2, Proposed Changes to Technical Specifications," dated September 2, 1977.

(2) Donald C. Switzer (NNECO) to Robert W. Reid (USNRC), "Millstone Nuclear Power Station, Unit No. 2, Proposed Changes to Technical Specifications," dated February 22, 1978.

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on April 19, 1978⁽³⁾. The SUR trip was then removed from the plant, prior to the start of Millstone Unit No. 2, Cycle 2. The basis for NNECO's request to remove the SUR trip, and the NRC's approval of this request, was that the SUR trip was an "equipment protection trip" serving no safety function, and was not credited in the plant's safety analyses. The FSAR safety analyses accepted by the NRC on May 10, 1974, and as updated and approved by the NRC for Cycle 2 and 3 operation, did not credit the SUR trip to provide protection for the Control Element Assembly (CEA) withdrawal event. The supplier of the NSSS and Cycle 1, 2, and 3 safety analysis was Combustion Engineering.

Documentation from CE in support of the removal of the SUR trip from the Technical Specifications in 1978 stated that the SUR trip was an equipment protection trip serving no safety function, and was not credited in the Millstone Unit No. 2 safety analyses. The FSAR, at that time, described the SUR trip as an equipment protection trip, serving as a backup to the administratively enforced startup rate limit.

NNECO informed the NRC in Licensee Event Report (LER) 50-336/96-029-00, dated September 16, 1996, that removal of the SUR trip in 1978 caused Millstone Unit No. 2 to be outside of the assumptions of the safety analysis for Cycles 2 and 3. In this LER, NNECO informed the NRC that, during the current licensing basis and design review of Millstone Unit No. 2, ASEA Brown Boveri - Combustion Engineering (ABB-CE) informed NNECO in July 1996 that the safety analysis indirectly credited the SUR trip to eliminate CEA withdrawal events from sub-critical from becoming limiting. ABB-CE stated that analyses performed by CE in support of Cycles 1, 2, and 3 did not directly credit the SUR trip to prevent fuel damage from CEA withdrawal events initiated from critical conditions (Modes 1 and 2). However, CE assumed that the SUR trip would promptly terminate any CEA withdrawal events initiated from sub-critical conditions, rendering them non-limiting, thereby indirectly crediting the SUR trip for Cycles 1, 2 and 3.

LER 50-336/96-029-01, dated June 3, 1997 (which supplements LER 50-336/96-029-00 and provides updated information), documents the results of the investigation and the corrective actions associated with this event. NNECO concluded that Millstone Unit No. 2 did operate outside of the assumptions of the safety analysis during Cycles 2 and 3, due to the removal of the SUR trip, because the safety analysis indirectly credited the SUR trip to eliminate CEA Withdrawal events from sub-critical from becoming limiting.

⁽³⁾ Robert W. Reid (USNRC) to Donald C. Switzer (NNECO) for issuance of Amendment No. 38 to Facility Operating License No. DPR-65, dated April 19, 1978.

The safety analysis for Millstone Unit No. 2 from Cycle 4 to the present time recognized the removal of the SUR trip and did not credit the SUR trip. Beginning in Cycle 4, specific analyses for the CEA withdrawal from subcritical event were supplied for NRC review and approval. These analyses showed the Variable Over Power Trip to be sufficient to provide protection against exceeding fuel design limits for CEA withdrawal events from subcritical. The NRC had previously reviewed and approved these CEA withdrawal events from subcritical analyses.

The existing analysis for the CEA withdrawal event from subcritical and low power conditions was performed by Siemens Power Corporation (SPC) and was reviewed and approved by the NRC in Amendment 139 to the Millstone Unit No. 2 Technical Specifications on March 20, 1989⁽⁴⁾. However, as part of the investigation, documented in LER 50-336/96-029-01, NNECO determined that the existing analysis for the CEA withdrawal event from subcritical and low power conditions contained certain errors which are unrelated to the SUR trip. The investigation determined that this SPC analysis contained two errors associated with the radial and axial power peaking factors used in the CEA withdrawal event from subcritical/low power conditions. First, the radial and axial power peaking factors used in the analysis did not consider the increased power peaking from control rod insertion within the requirements of the power dependent control rod insertion limits. Second, the analysis did not consider the possible increased radial and axial power peaking factors due to control rod configurations resulting from CEA Withdrawal events starting from subcritical.

These errors were corrected and the analysis for the CEA Withdrawal event from subcritical and low power conditions was re-performed. The resulting analysis, Siemens Report EMF-97-014, Revision 0, "Millstone Unit 2 Uncontrolled CEA Bank Withdrawal from Subcritical/Startup Analysis," dated February 1997, is enclosed to this letter. The analysis concludes that the Variable Over Power Trip will continue to prevent fuel design limits from being exceeded for the CEA Withdrawal event from subcritical and low power conditions. This conclusion is consistent with NUREG 1432 (CE Standard Technical Specifications) which states for analog plants, "The high power rate of change trip serves as a backup to the administratively enforced startup rate limit. The function is not credited in the accident analyses."

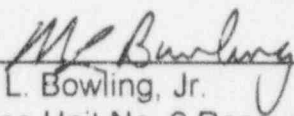
Additionally, the enclosed CEA withdrawal analysis states that the acceptance criteria for the event are defined in the USNRC's Standard Review Plan (SRP). However, it should be recognized that Millstone Unit No. 2 is not an SRP plant.

⁽⁴⁾ Guy S. Vissing (USNRC) to Edward J. Mroczka (NNECO), "Issuance of Amendment No. 139 (TAC # 68360)," dated March 20, 1989.

NNECO concludes that continued operation of Millstone Unit No. 2 without the SUR trip continues to be acceptable. Should you have any questions on the information provided, please contact Mr. R. G. Joshi at (860) 440-2080.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY



Martin L. Bowling, Jr.
Millstone Unit No. 2 Recovery Officer

Enclosure:

Siemens Power Corporation Report No. EMF-97-014, Revision 0, "Millstone Unit 2 Uncontrolled CEA Bank Withdrawal from Subcritical/Startup Analysis," dated February 1997.

cc: W. D. Travers, PhD., Director of Special Projects
H. J. Miller, Region I Administrator
D. P. Beaulieu, Senior Resident Inspector, Millstone Unit No. 2
D. G. McDonald, Jr., NRC Senior Project Manager, Millstone Unit No. 2