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Docket No. 50-423
B15144

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

Millstone Nuclear Power Station, Unit No. 3
Physics Methodology for PWR Reload Design

Summary

Northeast Utilities Service Company (NUSCO) has been a technology transfer licensee of Westinghouse since 1985. NUSCO has performed reload core physics design for the Haddam Neck Plant since 1987 and is planning to do so for the Millstone Unit No. 3 plant starting in Cycle 7. NUSCO has previously submitted topical reports to the NRC for both the Haddam Neck Plant and the Millstone Unit No. 3 plant using Westinghouse reload physics methods. Attached is a topical report demonstrating NUSCO capability to perform reload physics design using the Westinghouse ALPHA/PHOENIX-P/ANC (APA) methodology. The information included in this submittal will enable the NRC Staff to review and approve the use of Westinghouse methods for the Millstone Unit No. 3 reload physics design.

Background

In letters dated September 12, 1986,[1] and June 23, 1987,[2] NUSCO, on behalf of the Haddam Neck Plant, submitted a topical report (NUSCO-152) demonstrating NUSCO's ability to perform pressurized water reactor (PWR) reload physics design using the Westinghouse physics methodology and code system (ARK/TORTIS) with Haddam Neck Plant data. The NRC found the methodology, as presented in the report, acceptable for use by NUSCO to perform the physics analyses for the Haddam Neck Plant.[3] NUSCO has used this approved

(1) J. F. Opeka letter to C. I. Grimes/A. C. Thadani/V. S. Noonan, "Physics Methodology for PWR Reload Design," dated September 12, 1986.

(2) E. J. Mroczka letter to U.S. Nuclear Regulatory Commission, "Haddam Neck Plant, Physics Methodology for PWR Reload Design," dated June 23, 1987.

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methodology to perform the reload physics design for the Haddam Neck since 1987, covering the Haddam Neck Plant Fuel Cycles 15, 16, 17 and 18.

In a letter dated November 13, 1987,[4] NUSCO, on behalf of Northeast Nuclear Energy Company (NNECO), submitted a topical report (NUSCO-152, Addendum 2) demonstrating NUSCO's ability to perform PWR reload physics design using the Westinghouse physics methodology and code system (ARK/TORTIS) with Millstone Unit No. 3 plant data. The NRC found the methodology, as presented in the report, acceptable for use by NUSCO to perform the physics analyses for the Millstone Unit No. 3 Reactor[5]. To date, NUSCO has used this approved methodology for the Millstone Unit No. 3 reactor only for core follow activities and not for licensing activities.

In a letter dated January 3, 1994,[6] NUSCO, on behalf of the Haddam Neck Plant, submitted a topical report (NUSCO-152, Addendum 3) demonstrating NUSCO's ability to perform PWR reload physics design using the newer APA Westinghouse physics methodology and code system with Haddam Neck Plant data. The APA system is currently being used by Westinghouse on all reload designs and has been documented and accepted for use by the NRC.[7][8]

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(3) F. M. Akstulewicz letter to E. J. Mroczka, "Review of Physics Methodology for PWR Reload Design (NUSCO-152)," dated August 3, 1987.

(4) E. J. Mroczka letter to U.S. Nuclear Regulatory Commission, "Millstone Nuclear Power Station, Unit No. 3, Physics Methodology for PWR Reload Design," dated November 13, 1987.

(5) R. L. Ferguson letter to E. J. Mroczka, "Millstone Nuclear Power Station, Unit No. 3, Physics Methodology for PWR Reload Design," dated May 11, 1988.

(6) J. F. Opeka letter to U.S. Nuclear Regulatory Commission, "Haddam Neck Plant, Physics Methodology for PWR Reload Design," dated January 3, 1994.

(7) C. Berlinger letter to E. P. Rahe, "Acceptance for Referencing of Licensing Topical Report WCAP 10965-P and WCAP 10966-NP," dated June 23, 1986.

(8) A. C. Thadani letter to W. J. Johnson, "Acceptance for Referencing of the Westinghouse Topical Report WCAP 11596, Qualification of the Phoenix-P/ANC Nuclear Design System for Pressurized Water Reactor Cores," dated May 17, 1988.

Submittal of Topical Report NUSCO-152, Addendum 4

NUSCO, on behalf of NNECO, hereby submits a topical report (NUSCO-152, Addendum 4) demonstrating NUSCO's ability to perform PWR reload physics design using the newer APA Westinghouse physics methodology and code system with Millstone Unit No. 3 plant data. NUSCO intends to use the APA code system for the design of Millstone Unit No. 3, Cycle 7 and future cycles. NUSCO also intends to use the APA code system in Millstone Unit No. 3, Cycle 6 for various core follow and plant support activities.

The attached addendum presents data which benchmarks the APA models to operational data for Cycles 3, 4 and 5 from the Millstone Unit No. 3 Plant. This data, like the Haddam Neck Plant data presented in our submittal dated January 3, 1994, demonstrates NUSCO's qualification to use the Westinghouse APA methodology to model and analyze PWR cores.

NUSCO has been a technology licensee of Westinghouse since 1985 and will continue to take advantage of enhancements being made in the core design area by Westinghouse in order to continuously improve our reload design and core follow capability.

The information included in this topical report will enable the NRC to review and approve the use of Westinghouse methods for Millstone Unit No. 3 reload physics design. With regard to the schedule, we intend to use the APA code system for Millstone Unit No. 3 for some of the Millstone Unit No. 3 Cycle 6 activities, therefore, NNECO requests the NRC Staff approval of the Topical Report by September 1, 1995.

If you have any questions, please contact Mr. R. G. Joshi at (203) 440-2080.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

FOR: J. F. Opeka
Executive Vice President

BY: _____
S. E. Scace
Vice President

cc: See Page 4

cc: T. T. Martin, Region I Administrator
V. L. Rooney, NRC Project Manager, Millstone Unit No. 3
P. D. Swetland, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3