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September 8, 1989

Docket No. 50-213 B13352 Re: 10CFR50, Appendix J ISAP Topic 1.03

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

Gentlemen:

Haddam Neck Plant 10CFR50, Appendix J, Request for Exemption

Pursuant to 10CFR50.12, Connecticut Yankee Atomic Power Company (CYAPCO) hereby requests an exemption from certain requirements of 10CFR50, Appendix J. Specifically, CYAPCO is seeking a permanent exemption from the requirements of Section III.C of Appendix J to 10CFR50, for Containment Penetration P-3. Transmitted herewith is CYAPCO's request for a permanent exemption relating to the Type C testing requirements of 10CFR50, Appendix J, Section III.C. The exemption request and supporting technical justification is provided in Attachment 1.

The Commission's regulations, specifically 10CFR50.12(a), provide that exemptions may be granted from the requirements in 10CFR50 if "special circumstances" are present and the exemptions are "authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security." Under 10CFR50.12(a)(2)(ii), "special circumstances" warranting an exemption are present whenever, among other things, application of the regulation in particular circumstances "is not necessary to achieve the underlying purpose of the rule. . . . "

On the basis of the information provided herewith, CYAPCO concludes that the exemption for the subject penetration is justified under the standards of IOCFR50.12. As demonstrated in Attachment 1, the requested exemption will not present an undue risk to the public health and safety since no significant increase in the risk associated with containment leakage will result from the granting of the exemption. In fact, granting the exemption will result in a reduction in occupational exposure. The modifications that would be required to satisfy the specific requirements of Appendix J would result in significant worker exposure.

Furthermore, "special circumstances" are present in that application of the regulation is not necessary to achieve the underlying purpose of Appendix J. The purpose of the leak rate testing requirements in Appendix J is to provide reasonable assurance that containment leakage during a design basis event will not exceed the leakage limits specified in licensing documents or assumed in the pertinent accident analyses. The Type C testing requirements of Section III.C of Appendix J are established to provide adequate assurance that

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the penetration in question will remain sufficiently leak tight. As demonstrated in Attachment 1, there is reasonable assurance that containment leakage during a design basis event will not exceed the applicable leakage limits and that an exemption from Type C testing will not significantly increase the risk to public health and safety associated with containment leakage.

In summary, CYAPCO has concluded that the exemption discussed in Attachment 1 is warranted under the standards of 10CFR50.12. It should also be noted that through ISAP Topic 1.03, CYAPCO has evaluated a number of plant modifications to achieve compliance with Appendix J requirements. In a letter dated March 2, 1989, CYAPCO provided the Staff with an update to the ISAP topic reviews. The modifications made during previous outages represent CYAPCO's prudent steps to improve the containment integrity of the Haddam Neck Plant and demonstrate CYAPCO's good faith efforts to satisfy the requirements of Appendix J.

This submittal represents the final anticipated exemption request related to 10CFR50 Appendix J. CYAPCO has submitted exemption requests associated with a number of other penetrations in a letter dated April 28, 1989. (2) CYAPCO respectfully requests approval of this exemption request prior to the end of December 1989 in order to ensure sufficient time remains available to implement any subsequently required modifications prior to start-up from the next refueling outage.

We hope you will find this information satisfactory, and we remain available to answer any questions you may have.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY

E.J. Mroyka

E. J. Mroczka Senior Vice President

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By: C. F. Sears Vice President

cc: W. T. Russell, Region I Administrator

A. B. Wang, NRC Project Manager, Haddam Neck Plant

J. T. Shedlosky, Senior Resident Inspector, Haddam Neck Plant

- E. J. Mroczka letter to the U.S. Nuclear Regulatory Commission, "Haddam Neck Plant, Integrated Safety Assessment Program (ISAP)," dated March 2, 1989.
- (2) E. J. Mroczka letter to the U.S. Nuclear Regulatory Commission, "Haddam Neck Plant, 10CFR50, Appendix J, Request for Exemption," dated April 28, 1989.

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Attachment 1

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Haddam Neck Plant

Requests for Exemption From 10CFR50, Appendix J Requirements

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> Haddam Neck Plant Request for Permanent Exemption From 10CFR50 Appendix J for Penetration P-3

Description

CYAPCO requests permanent exemption from the requirements of 10CFR50, Appendix J, paragraph III.C, to Type C leak test Containment Isolation Check Valves SI-CV-862A through D and manual lock closed Containment Isolation Valve SI-V-860. These valves are a part of the high-pressure safety injection (HPSI) system. CYAPCO presently Type C leak tests Check Malves SI-CV-862A through D using water as the testing medium and presently does not perform an LLRT on SI-V-860.

Justification Bases

The HPSI system penetration piping will pressurize upon a safety injection signal. It will remain pressurized at a pressure greater than 1.10 Pa (Pa = 40 psia) following small, medium, and large-break LOCA scenarios where containment isolation and RHR recirculation are required. The penetration header will continue to be pressurized until the containment atmosphere poses no radiological danger to the environment.

The injection phase of HPSI which occurs after a safety injection actuation signal consists of injection of RWST inventory via the HPSI pump(s) through P-3 and into the RCS. This occurs at an approximate pressure of 1000 to 1400 psig in the HPSI discharge header. No leakage of containment atmosphere is expected to occur through this penetration while in this phase.

The next phase starts when the RWST volume reaches a predetermined low level. An RHP pump suction is aligned to the containment sump to supply a HPSI pump with containment sump water. This phase is called short-term or high head recirculation. The pressure in the HPSI header in this phase is approximately 1000 psig. No leakage of containment atmosphere is expected to occur while in this phase. This phase will continue for at least eight hours, after which long-term recirculation will begin.

In long-term recirculation, the HPSI pumps are stopped but the HPSI penetration piping remains pressurized at greater pressure than peak accident pressure because the RHR pump discharge is aligned to HPSI system. The operating RHR pump is still taking suction from the containment sump. Long-term recirculation will continue until the core has been cooled and can remain cool without the use of the RHR heat exchangers. No leakage of containment atmosphere is expected to occur while in this phase. Long-term recirculation will be terminated after the containment atmosphere has been depressurized and purified by the containment's internal clean-up system. U.S. Nuclear Regulatory Commission B13352/Attachment 1/Page 2 September 8, 1989

From the time a safety injection signal has been initiated to the time when the containment atmosphere poses no radiological danger, the HPSI system discharge piping (including Penetration P-3) will continue to be at a pressure greater than 1.10 times the peak containment accident pressure except for a short time when switching from the initial injection phase to the high head recirculation phase. During this time, the HPSI discharge header will not be pressurized for approximately two minutes due to the temporary shutdown of the HPSI pump(s) for valve manipulations. The containment atmosphere is not expected to escape to the environment through this penetration during these two minutes due to the HPSI piping of P-3 being initially full of water after the pumps are turned off, check valves SI-CV-862A through D and check valves SI-CV-856A and B (HPSI pumps discharge) being leak tested (see below) and manual valves SI-V-864 and SI-HCV-1881 being locked closed during MODES 1 thru 4 (these valves isolate the branch lines that connect to the HPSI discharge header upstream of valves SI-CV-862A through D and downstream of SI-CV-856A). There will be no expected leakage of containment atmosphere through this penetration during this entire period.

The piping and components of this system are included in the Haddam Neck technical specification for controlled leakage monitoring of the recirculation system. The present technical specification limit is six liters per hour. CYAPCO has previously imposed an administrative leakage limit of 3 liters per hour which will also be the limit with the incorporation of the standard technical specifications after the 1989 refuel outage. The HPSI system is a safety grade system which is seismically supported from the RCS to the RWST. The HPSI system is in the Haddam Neck in-service inspection program. This program requires valves SI-CV-862A through D to be periodically leak tested because they are RCS pressure isolation valves. The maximum leak rate they are allowed is 1 gpm (water) per technical specifications. In addition, check valves SI-CV-856A and B which are contained in the individual HPSI pump discharge lines will be leak tested as a part of the Haddam Neck ISI program beginning with the 1989 refuel outage. The check valves will have a maximum leak rate acceptance criterion of 1 gpm each. Check Valves SI-CV-862A through D and SI-CV-856A and B will continue to be leak tested with water per Haddam Neck's technical specifications and/or the Haddam Neck ISI program and will be repaired if their 1-gpm leakage limit is exceeded.

There are accident scenarios which cause a high containment pressure signal and subsequent HPSI pump autostart where long-term recirculation will not be initiated. These events are limited to small-break LOCAs including control rod ejection or non-LOCA events such as a steam line break inside containment. In these events, the HPSI pump which autostarted will be shut off due to high RCS pressure. Due to the RCS retaining its inventory, no containment air leakage is expected to occur through the HPSI header and to the environment. The HPSI header would remain water solid and leakage of any RCS fluid would be limited by the 1 gpm leakage limit for the check valves described above. The RCS pressure would be reduced so that the RCS could eventually be placed on normal RHR. U.S. Nuclear Regulatory Commission B13352/Attachment 1/Page 3 September 8, 1989

A probabilistic risk assessment (PRA) of P-3 has been performed. This PRA conservatively determined that the risk of public exposure due to core-melt accident leakage through this penetration is 1.9 man-rem due to Appendix J concerns, and 7.3 man-rem from inter-system LOCA concerns, or a total of 9.2 man-rem.

The added benefit of modifying this penetration to allow Type C testing with air as the test medium is negligible and the costs in dollars and man-rem is not justified. The estimated cost to modify this penetration to enable Appendix J Type C leakage testing with air is \$202,512. The estimated man-rem exposure required to complete the modification is 20 man-rem.

Conclusion

Core-melt accident leakage through Penetration P-3 is not expected to occur because of system pressure. Appendix J Type C testing of P-3 containment isolation valves should not be required. The small decrease in public risk exposure achieved by performing Type C testing does not support the cost in dollars or man-rem required to make modifications to allow Type C testing with air as the test medium.

Based on the above, CYAPCO believes that a permanent exemption from the applicable requirements of Appendix J for Penetration P-3 is justified, and hereby requests a permanent exemption from the testing requirements of Section III.C of Appendix J, as described above.



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