

February 26, 2004

Mr. K. J. Heider  
Vice President - Operations and Decommissioning  
Connecticut Yankee Atomic Power Company  
362 Injun Hollow Road  
East Hampton, CT 06424-3099

SUBJECT: EXEMPTION FROM 10 CFR 72.212 AND 72.214 FOR DRY SPENT FUEL  
STORAGE ACTIVITIES - HADDAM NECK PLANT (TAC NO. L23642)

Dear Mr. Heider:

This is in response to your letter dated August 28, 2003, requesting an exemption from 10 CFR 72.212(a)(2), 72.212(b)(2)(i)(A), and 10 CFR 72.214, pursuant to 10 CFR 72.7. In your letter you requested an exemption from the requirements in Certificate of Compliance (CoC) No. 1025, Appendix A, Limiting Conditions for Operations (LCO) items 3.1.1, 3.1.4, 3.1.7, 3.1.8, 3.2.1, and Appendix B, Table B2-3, for the NAC-MPC dry spent fuel storage system. This exemption would allow Connecticut Yankee Atomic Power Company (CYAPCO) to incorporate vacuum drying enhancements of the proposed NAC-MPC Amendment No. 4 to support fuel loading at the Haddam Neck Plant. Specifically, the exemption would allow CYAPCO to: (1) increase vacuum drying time limits; (2) increase canister in transfer cask time limits, (3) revise fuel cooldown requirements; (4) delete canister removal from concrete cask requirements; (5) revise surface contamination removal time limits; and (6) revise allowable contents fuel assembly limits.

We understand that you requested the vacuum drying enhancements in order to reduce overall processing times and occupational dose to workers. CYAPCO determined that reducing unnecessary cooldown cycles would minimize worker exposure by eliminating additional equipment and handling activities. Reduced cooldown cycles would also reduce the potential for personnel errors and worker injury. Security would also be enhanced by minimizing the fuel processing configuration prior to final storage.

The U.S. Nuclear Regulatory Commission (NRC) staff performed a safety evaluation of the proposed exemption. The enclosed safety evaluation concludes that the requested changes will not compromise the thermal performance of the NAC-MPC system nor increase the potential for dose to members of the public.

In a letter dated August 1, 2003, the certificate holder of the NAC-MPC system, NAC International, requested an amendment to CoC No. 1025, to incorporate vacuum drying enhancements. That request was supplemented on September 5, 2003, and November 5, 2003. The information provided in the amendment request, as supplemented, is relevant to the exemption request by CYAPCO and provides the safety basis for the increases in the time limits. The staff has determined that this information provides an adequate basis to grant the exemption. Accordingly, the exemption will be effective immediately.

The NRC staff evaluated the public health and safety and environmental impacts of the proposed exemption and determined that granting the exemption would not result in any

significant impacts. For this action, an Environmental Assessment and Finding of No Significant Impact have been prepared and published in the Federal Register (69 FR 4542, January 30, 2004). A copy of the Federal Register Notice was provided to you by letter dated January 22, 2004. Based on the foregoing considerations, the staff has determined that granting the proposed exemption from the provisions of 10 CFR 72.212(a)(2), 72.212(b)(2)(i)(A), and 10 CFR 72.214 is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest. Specifically, this exemption permits CYAPCO to incorporate the vacuum enhancements as delineated in the attached Safety Evaluation Report. These vacuum drying enhancements will not significantly impact the quality of the human environment. Therefore, the NRC staff has concluded that the proposed changes will not pose an increased risk to public health and safety.

If you have any questions, please contact me or L. Raynard Wharton of my staff at 301-415-8500. Any future correspondence related to this action should reference Docket 72-39 and TAC No. L23642.

Sincerely,

/RA/

Larry W. Camper, Deputy Director  
Spent Fuel Project Office  
Office of Nuclear Material Safety  
and Safeguards

Docket Nos. 72-39 (50-213)

Enclosure: Safety Evaluation

K. J. Heider

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Sincerely,

/RA/

Larry W. Camper, Deputy Director  
Spent Fuel Project Office  
Office of Nuclear Material Safety  
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Docket Nos. 72-39 (50-213)

Enclosure: Safety Evaluation

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\* - see previous concurrence

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**SAFETY EVALUATION REPORT**  
Docket No. 72-39  
Haddam Neck Plant  
Independent Spent Fuel Storage Installation

**Summary**

By letter dated August 28, 2003, Connecticut Yankee Atomic Power Company (CYAPCO or the licensee) requested the U. S. Nuclear Regulatory Commission (NRC) grant an exemption to certain 10 CFR 72.212 and 72.214 requirements. Specifically, CYAPCO requested an exemption from the requirements in Certificate of Compliance (CoC) No. 1025, Appendix A, Limiting Condition for Operation (LCOs) 3.1.1, 3.1.4, 3.1.7, 3.1.8, 3.2.1, and Appendix B, Table B2-3, for the NAC-MPC system. The licensee's basis for the request was to reduce occupational exposure resulting from repeated vacuum drying cycles of the NAC-MPC system.

The NRC has evaluated the technical issues associated with this exemption and concluded that the proposed exemption does not pose an increased risk to the public health and safety.

**Evaluation**

On August 1, 2003, NAC International (NAC) submitted an application for an amendment to CoC No. 1025 for the NAC-MPC, to incorporate vacuum drying enhancements. This amendment is currently in the NRC licensing review process and, if approved, will be noticed in the Federal Register for proposed incorporation into 10 CFR 72.214 as an approved amendment to the NAC-MPC. Since the licensee is loading NAC-MPC systems and the vacuum drying enhancements would likely reduce occupational dose, CYAPCO requested this exemption to allow use of the amended enhancements prior to issuance of the CoC amendment.

The exemption would allow CYAPCO to: (1) increase vacuum drying time limits; (2) increase canister in transfer cask time limits, (3) revise fuel cooldown requirements; (4) delete canister removal from concrete cask requirements; (5) revise surface contamination removal time limits; and (6) revise allowable contents fuel assembly limits.

NAC addressed Interim Staff Guidance No. 11 (ISG-11), Revision 2, "Cladding Considerations for the Transportation and Storage of Spent Fuel," guidance in its amendment application. ISG-11, Revision 2, established a maximum allowable cladding temperature limit of 400°C (752 °F) for normal conditions of storage and for short term operations including cask drying and backfilling. The staff issued ISG-11, Revision 3, on November 17, 2003, to clarify some acceptance criteria provided in Revision 2 and to add criteria allowing higher cladding temperature limits for low burnup fuel. The staff evaluated the NAC amendment and the CYAPCO exemption against the new ISG criteria and determined that the exemption request meets the cladding temperature limit of 400°C. With regard to the thermal cycling criteria of ISG-11, Revision 3, the staff also determined that there was no need to limit the number of heatup and cooldown cycles because the maximum allowable cladding temperature never exceeds 400°C for CYAPCO fuel. Safety Analysis Report Tables 4.5.3-7 and 4.5.3-9 show that

the temperature limits of 400°C are not exceeded, and therefore, the limitations on the number of cycles is not needed. CYAPCO is loading low burnup spent fuel with less than 45 Gwd/MTU (low burnup). CYAPCO has also indicated that most of its spent fuel has stainless steel cladding and is not associated with the hydride reorientation phenomenon that occurs in zirconium-based cladding materials.

On November 5, 2003, NAC supplemented its application in response to staff questions related to the thermal and structural review. The staff reviewed the amendment application and performed confirmatory evaluations of the thermal analysis supporting the vacuum drying enhancements associated with CY fuel assemblies. The staff also reviewed NAC's proprietary calculations regarding the transient thermal analysis of the CY-MPC transfer cask and the CY-MPC canister drain down during transfer operations.

### **Conclusion**

Based on the information presented in the NAC-MPC amendment application and CYAPCO's exemption request, and the staff's independent calculations, the staff has reasonable assurance that the vacuum drying enhancements for the NAC-MPC system do not cause the fuel cladding to exceed its thermal limits; therefore, the proposed exemption does not pose an increased risk to the public health and safety and is acceptable.