CONNECTICUT YANKEE ATOMIC POWER COMPANY

HADDAM NECK PLANT PLANT
362 INJUN HOLLOW ROAD • EAST HAMPTON, CT 06424-3099

August 3, 2022
CY-22-012
Re: 10 CFR 72.4 and 10 CFR 72.30

ATTN: Document Control Desk,
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Connecticut Yankee Atomic Power Company
Haddam Neck Plant Independent Spent Fuel Storage Installation
NRC License No. DPR-61 (NRC Docket No. 50-213)

72-039

Subject: Supplemental Information for the Three-Year Update to the Independent Spent Fuel Storage Installation Decommissioning Funding Plan

On December 10, 2021, pursuant to the requirements of 10 CFR 72.30(c) and 10 CFR 72.4, Connecticut Yankee Atomic Power Company (CYAPCO) provided the three-year update to the Independent Spent Fuel Storage Installation (ISFSI) Decommissioning Funding Plan (DFP) (Reference 1). It included a modified assumption that significantly reduced the amount of material that would be shipped offsite as low-level radioactive waste. This letter provides supplemental information to define the basis for the modified assumption.

CYAPCO utilized TLG Services, LLC as the independent contractor to perform the Decommissioning Cost Estimates (DCEs) provided on December 10, 2018 and December 10, 2021 (References 2 and 1, respectively). Attachment 1 provides TLG Services, LLC's bases for the reduction in the volume of radioactive waste from that assumed in the previous DCE.

In addition, the volume of low-level radioactive waste that is assumed to require remediation and shipment to an offsite facility is consistent with other licensees' DCEs that the NRC has previously reviewed. In References 3 and 4, South Carolina Electric & Gas and Santee Cooper submitted their initial decommissioning cost estimates for the Virgil C. Summer Nuclear Station Unit 1 ISFSI. These documents state:

> "The dry storage vendor, Holtec International, does not expect the overpacks to have any interior or exterior radioactive surface contamination. Any neutron activation of the steel and concrete is expected to be extremely small. The decommissioning estimate is based on the premise that some of the inner steel liners and concrete overpacks will contain low levels of neutron-induced residual radioactivity that would necessitate remediation at the time of decommissioning. As an allowance, 5 of the 75 Holtec overpacks are assumed to be affected, i.e., contain residual radioactivity. The allowance quantity is based upon the number of casks required for the final core off-load (i.e., 157 off-loaded assemblies, 37 assemblies per cask which results in 5 overpacks). It is assumed that these are the final casks offloaded;

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> consequently they have the least time for radioactive decay of the neutron activation products."

In Reference 5, the NRC provided their analysis of the decommissioning cost estimates for the Virgil C. Summer Nuclear Station Unit 1 ISFSI. The NRC states:

> "Based on its financial analysis of SCE&G's and Authority's submittals, the NRC staff finds that the DCEs submitted for 2016: (1) are based on reasonable costs of a third party contractor; (2) include an adequate contingency factor; (3) reflect the cost of meeting the 10 CFR 20.1402 criteria for unrestricted use; and (4) are based on reasonable and documented assumptions. Therefore, the NRC finds that the 2016 DCEs adequately estimate the cost, to carry out required ISFSI decommissioning activities prior to license termination, and that the 2016 DCEs are acceptable."

In conclusion, the TLG Services, LLC bases provided in Attachment 1 and the precedent identified above justify the reduction in the volume of material that is assumed to be required to be remediated and shipped offsite in the DCE provided in December 2021 (Reference 1).

If you have any questions regarding this submittal, please do not hesitate to contact me at (508) 612-3322.

Respectfully,

Timothy Conry
Treasurer

Attachment:

1. TLG Services, LLC Bases for Low-Level Radioactive Waste Volume Assumption in December 2021 Decommissioning Cost Estimate

References:

1. Letter from T. Conry (CYAPCO) to Document Control Desk (NRC), Three-Year Update to the Independent Spent Fuel Storage Installation Decommissioning Funding Plan, dated December 10, 2021 (CY 21-015) (ADAMS Accession Number: ML21362A132)

2. Letter from C. Pizzella (CYAPCO) to Document Control Desk (NRC), Three-Year Update to the Independent Spent Fuel Storage Installation Decommissioning Funding Plan, dated December 10, 2018 (CY-18-021) (ADAMS Accession Number: ML18354A741)

3. Letter from South Carolina Electric & Gas to Document Control Desk (NRC), Virgil C. Summer Nuclear Station, Unit 1, Decommissioning Funding Plan for Independent Spent Fuel Storage Installations (ISFSIs), dated March 15, 2016 (ADAMS Accession Number: ML16081A168)

4. Letter from Santee Cooper to Document Control Desk (NRC) Virgil C. Summer Nuclear Station, Unit 1, Decommissioning Funding Plan for Independent Spent Fuel Storage Installation (ISFSIs), dated March 18, 2016 (ADAMS Accession Number: ML16081A136)

5. NRC Letter to V. C. Summer Nuclear Station, U.S. Nuclear Regulatory Commission Analysis of South Carolina Electric & Gas Company's and South Carolina Public Service Authority's Initial Decommissioning Funding Plans for Virgil C. Summer Independent Spent Fuel Storage Installation, dated May 26, 2021 (ADAMS Accession Number: ML21140A214)

cc: D. Lew, NRC Region I Administrator
T. Dimitriadis, Chief, Decommissioning Branch, NRC, Region 1
Y. Diaz-Sanabria, Chief, Storage and Transportation Licensing Branch, Division of Fuel Management, Office of Nuclear Material Safety and Safeguards
J. Semancik, Director, CT DEEP, Radiation Division
M. Firsick, CT DEEP, Radiation Division

ATTACHMENT 1 TO CY-22-012

TLG Services, LLC Bases for Low-Level Radioactive Waste Volume Assumption in December 2021 Decommissioning Cost Estimate

Prior to 2021, the Connecticut Yankee Atomic Power Company (CYAPCO) ISFSI decommissioning cost estimate was based on the general assumption that all of the overpacks and storage pads would be contaminated and require disposal as low-level waste. For the 2021 estimate, it was discussed that this assumption was overly conservative. CYAPCO engaged TLG to change this assumption to the standard that TLG assumes for the majority of their clients. Specifically, the number of storage canisters is based upon the number of canisters required for the final core off-load. It is assumed that these are the final casks offloaded; consequently, they have the least time for radioactive decay of the neutron activation products. The remaining overpacks and storage pad are assumed to be surveyed and free released.

While there is no generic guideline available for the quantity of activated material present in different designs for Dry Cask Storage Systems, the Final Safety Analysis Report (FSAR) for several storage systems references activation as a characteristic that must be assessed during decommissioning; however, the amount of neutron activation is expected to be small. For reference several documents are listed below:

Holtec Hi-Storm FSAR 3/31/16

ADAMS Accession Number: ML16138A100

Section 2.4, Decommissioning Considerations. This document states that the overpack would have no interior or exterior surface contamination and that any neutron activation is expected to be extremely small. It is also stated that the overpack could be decontaminated to allow recycle or reuse options. In addition, no residual contamination is expected to be found on the storage pad.

NUHOLMS HD Horizontal Modular Storage System for Irradiated Nuclear Fuel, Safety Analysis Report, Rev. 0, April, 2004

ADAMS Accession Number: ML041540170

Section 2.4 Decommissioning Considerations. This document states that because of minimal contamination of the outer surface of the Dry Shielded Canister (DSC), no contamination is expected inside the Horizontal Storage Module (HSM). It is further stated that the HSMs can be dismantled and disposed of using commercial techniques.

NAC-MPC Final Safety Analysis Report, Revision 12, April 2019

ADAMS Accession Number: ML19113A211

Section 2.4 Decommissioning Considerations. This document states that activation of the carbon steel liner, concrete, support plates, and reinforcing bar could occur due to neutron flux from the stored fuel. Since the neutron flux rate is low, only minimal activation of carbon steel in the

concrete cask is expected to occur. It is expected that the concrete will be broken up, and steel components segmented, to reduce volume. Any contaminated or activated items are expected to qualify for near-surface disposal as low specific activity material. In addition, the storage pad, fence, and supporting utility fixtures are not expected to require decontamination as a result of use of the Universal Storage System.

NUREG-2215, Standard Review Plan for Spent Fuel Dry Cask Storage Systems and Facilities, April 2020

ADAMS Accession Number: ML20121A190

Section 14 Decommissioning Evaluation. This document describes the NRC's objective to ensure that the applicant's provisions for eventual decontamination and decommissioning of the ISFSI provide reasonable assurance that:

(1) the proposed provisions for eventual decontamination and decommissioning of the ISFSI will provide adequate protection of public health and safety
(2) funds will be available to decommission the ISFSI
(3) the design and operational features of the ISFSI facilitate eventual decontamination and decommissioning.

IAEA Technical Document -1081 Spent fuel storage and transport cask decontamination and modification, April 1999

URL: https://www-pub.iaea.org/MTCD/publications/PDF/te_1081_prn.pdf

Section 2.3 Neutron Activation of Cask Structure: While this publication states that in 8 to 10 years after fuel removal, the activated casks and concrete should decay to acceptable levels, currently there is no Below Regulatory Concern (BRC) for US licensees.

Discussion and Conclusions

A MARSSIM-type survey on the over-pack steel and concrete using the most sensitive and appropriate detection instrument available (per MARSSIM) would determine if the subject containers are free releasable. Note that with evolving technologies it is expected that the level of detection for key radionuclides will improve over time.

In terms of the TLG "Class A" thumb rule: Using the volume of the cask systems for the last full core off-load is reasonable as these are likely to have the highest neutron flux/residual activation products with the least amount of decay time. Ultimately, a MARSSIM-type survey and characterization should be performed on the remaining site components post-DOE pickup to determine if contamination/activation products are present. In the case of a SAFSTOR scenario where the DOE removes the stored spent fuel 10+ years prior to site demolition (assumes that

TLG Services, LLC Bases for Low-Level Radioactive Waste Volume Assumption in December 2021 Decommissioning Cost Estimate

ISFSI and Power Block decommissioning and dismantlement is occurring in the same time period), the probability of free release is much improved.

Making the above-described change to the CYAPCO Haddam Neck Plant ISFSI decommissioning cost estimates results in a significant reduction in waste volume and disposal costs. TLG believes this change is reasonable and is consistent with the DCEs developed by TLG for other utilities.