

# **Measurements and Characterization of Environmental Neutron and Gamma Dose Equivalents Surrounding Two Dry Cask Spent Fuel Storage Facilities**

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## **ABSTRACT**

Maine Yankee and Connecticut Yankee reactor sites are undergoing large-scale decommissioning. For each of these sites, the spent nuclear fuel is being temporarily stored in dry cask storage facilities at a portion of the original licensed property. Each of the spent nuclear fuel (SNF) storage casks hold approximately 25 spent fuel assemblies. Additional storage casks for the greater-than-Class C waste (GTCC) are also used. In the case of Maine Yankee, the fuel is contained in 64 casks (60 SNF, 4 GTCC) and in the case of Connecticut Yankee the fuel is contained in 43 casks (40 SNF, 3 GTCC). In both cases, the casks are stored in a vertical configuration on concrete pads with a separation between the casks of between 4 and 6 feet.

In order to establish a controlled area boundary around each facility such that a member of the public annual dose level of 25 mrem could be demonstrated per 40CFR190, measurements of gamma and neutron dose equivalents were conducted.

The gamma measurements were made with a high pressure ionization chamber (HPIC) and the neutron measurements were made with a large Tissue Equivalent Proportional Counter (TEPC). The data assessment and conclusions are presented from measurements performed around these facilities. The conclusions will include the finalized boundary determinations from each of these facilities including the estimated uncertainties and analysis sensitivities from the combined measurements.