9.1.2 Spent-Fuel Storage

9.1.2.1 Design Bases

9.1.2.1.1 Nuclear Design

A full array in the loaded spent-fuel rack is designed to be subcritical, by at least 5% Δk. Neutron-absorbing material, as an integral part of the design, is employed to assure that the calculated k_{eff}, including biases and uncertainties, will not exceed 0.95 under all normal and abnormal conditions.

9.1.2.1.2 Storage Design

The fuel storage racks provided in the spent-fuel storage pool provide storage for 270% of one full core fuel load.

9.1.2.1.3 Mechanical and Structural Design

The spent-fuel storage racks in the Reactor Building contain storage space for fuel assemblies (with channels) or bundles (without channels). They are designed to withstand all credible static and seismic loadings. The racks are designed to protect the fuel assemblies and bundles from excessive physical damage which may cause the release of radioactive materials in excess of 10CFR20 and 10CFR100 requirements, under normal and abnormal conditions caused by impacting from either fuel assemblies, bundles or other equipment.

The spent-fuel pool is a reinforced concrete structure with a 6.35 mm thick stainless steel liner. The fuel storage pool liner seismic classification is provided in Table 3.2-1. The bottom of all pool gates are sufficiently high to maintain the water level over the spent-fuel storage racks to provide adequate shielding and cooling. All pool fill and drain lines enter the pool above the safe shielding water level. Redundant anti-siphon vacuum breakers are located at the high point of the pool circulation lines to preclude a pipe break from siphoning the water from the pool and jeopardizing the safe water level.

The racks are constructed in accordance with a quality assurance program that ensures that the design, construction and testing requirements are met.

The fuel storage racks are designed to handle irradiated fuel assemblies. The expected radiation levels are well below the design levels.

In accordance with Regulatory Guide 1.29, the fuel storage racks are Seismic Category I. The structural integrity of the rack will be demonstrated for the load combinations described below using linear elastic design methods.