

5.3 AUXILIARY EQUIPMENT

5.3.1 Fuel Storage

- A. Normal storage for unirradiated fuel assemblies is in critically-safe new fuel storage racks in the reactor building storage vault; otherwise, fuel shall be stored in arrays which have a K_{eff} less than 0.95 under optimum conditions of moderation or in NRC-approved shipping containers.
- B. The spent fuel shall be stored in the spent fuel storage facility which shall be designed to maintain fuel in a geometry providing a K_{00} less than or equal to 0.95.
- C. The maximum U-235 loading in grams of U-235 per axial centimeter of fuel shall not exceed 15.6 gms U-235/cm.
- D. Loads greater than the weight of one fuel assembly shall not be moved over stored irradiated fuel in the spent fuel storage facility.
- E. The spent fuel shipping cask shall not be lifted more than six inches above the top plate of the cask drop protection system. Vertical limit switches shall be operable to assure the six inch vertical limit is met when the cask is above the top plate of the cask drop protection system.
- F. The temperature of the water in the spent fuel storage pool, measured at or near the surface, shall not exceed 125°F.

BASIS

The specification of K_{00} 0.95 and the maximum U-235 loading of 15.6 gm U-235/cm per axial centimeter for fuel in the spent fuel storage facility assures an ample margin from criticality. Conservative assumptions and allowance for tolerances, void effects, calculational uncertainties, pool temperature effects, etc. have been considered in the derivation of these limits (1,2). Note that the 15.6 gm U-235/cm is equivalent to a 3 w/o enrichment. (7)

The 15.6 gm U-235/cm is the limit of U-235 at any plane through the assembly perpendicular to the length of the assembly. It is to assure that possible non-uniform enrichments along the length of fuel rods cannot lead to a critical condition.

The effects of a dropped fuel bundle onto stored fuel in the spent fuel storage facility has been analyzed. This analysis shows that the fuel bundle drop would not cause doses resulting from ruptured fuel pins that exceed 10 CFR 100 limits (3, 4, 5) and that dropped waste cans will not damage the pool liner.

The elevation limitation of the spent fuel shipping cask to no more than 6 inches above the top plate of the cask drop protection system prevents loss of the pool integrity resulting from postulated drop accidents. An analysis of the effects of a 100 ton cask drop from 6 inches has been done (6) which showed that the pool structure is capable of sustaining the loads imposed during such a drop. Limit switches on the crane restrict the elevation of the cask to 6 inches when it is above the top plate.