

5.4.2 Reactor Core

The reactor core shall consist of uranium fuel in the form of ^{12.8}6 weight percent or less enriched UO₂ pellets in metal cladding, arranged in roughly a cylindrical fashion with four control rods placed symmetrically about the core periphery. The total core configuration and the arrangement of individual fuel pins, including any experiment, shall comply with the requirements of these Technical Specifications found in Sections 3.1 and 3.2 of this license. The core shall consist of all SPERT (F1) fuel described (5.4.3) or approximately half of SPERT (F1) fuel with the remainder (experiment) being made up of low enriched (<4.8 w/o) uranium light water reactor type fuel of typical power reactor design and arrangement.

The fuel pins are supported and positioned on a fuel pin support plate, drilled with holes to accept tips on the end of each pin. The support plate rests on a carrier plate which forms the base of a three-tiered overall core support structure. An upper fuel lattice plate rests on the top plate, and both are drilled through with holes with the prescribed arrangement to accommodate the upper ends of the fuel pins. The lower fuel pin support plate, a middle plate, and the upper fuel pin lattice plate are secured with tie rods and bolts. The entire core structure is supported vertically and anchored by four posts set in the floor of the reactor tank.

5.4.3 Fuel Pins

Core fuel pins to be utilized are 4.8 weight percent enriched SPERT (f-1) fuel rods. Each fuel rod is made up of sintered UO₂ pellets, encased in a stainless steel tube, capped on both ends with a stainless steel cap and held in place with a chromium nickel spring. Gas gaps to accommodate fuel expansion are also provided at both the upper end and around the fuel pellets. Figure 4.7 of the SAR depicts a single fuel pin and its pertinent dimensions.

Any fuel pins used in an experiment shall consist of uranium fuel in the form of 6 weight percent or less enriched UO₂ pellets encapsulated in metal cladding. ^{4.8}