SAXTON NUCLEAR EXPERIMENTAL CORPORATION

DOCKET NO. 50-146
LICENSE DPR-4

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CHANGE REQUEST NO. 30

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1. Applicant hereby submits Change Request No. 30 in compliance with paragraph 3B of License DPR-4 for change of the Technical Specifications to be authorized by the Commission as provided in 10 CFR 50.59.

SAXTON NUCLEAR EXPERIMENTAL CORPORATION

by /s/ R. E. Neidig
President

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1) Purpose of Change

In a previous test of Zircaloy-4 clad fuel rods* internally pressurized to produce tensile stresses of approximately 22,000 psi, unexpected local diameter changes of 2% occurred after 4700 EFPH operation. The purpose of this change is, then, to provide more inpile creep data on Zircaloy-4 cladding over the pressure range which will yield tensile stresses up to 22,000 psi and peak mean clad temperatures up to 721°F.

2) Safety Considerations

Although the previous inpile creep test rods experienced greater local strains than expected, the safety of the reactor and the public was not jeopardized. In order to further reduce the chance of excessive strains producing failures, these test rods will be periodically (every 2,000 EFPH or less) measured for strain with the use of a remote profilometer which is accurate to ± 0.0002 inch.

3) Health and Safety

It is our opinion that the health and safety of the public will not be endangered by this change.

4) Description of Change

In Supplement No. 1 to Technical Specifications, add the following Test Fuel Assemblies to Item F.2.

Test Fuel Assembly XX

One 9 rod subassembly of standard pitch and array shall contain the following:

a. Two burnable poison test rods containing borosilicate (Pyrex) glass tubing (0.388 nom. O.D. x 0.251 nom. I.D.) sealed in type 304 stainless steel clad (0.4315 nom. O.D. x 0.019 nom. wall thickness) will be suspended in a type 304 stainless steel RCC thimble guide tube

* Two Zircaloy-4 clad rods, containing UO_2 pellets enriched to 17.4% U-235, approved under Change No. 22.

(0.519 nom. O.D. x 0.4959 nom. I.D.). The borosilicate glass is annular in cross section and is supported on the inner side by a type 304 stainless steel tube (o.245 nom. O.D. x 0.007 nom. wall thickness). These rods may contain a 0.02 inch diameter Al-Co alloy tracer wire sealed in a 0.35 inch diameter titanium tube suspended in the central void from an attachment to the inner surface of the top end plug.

b. The four corner positions and the center position of the subassembly contain dummy fuel rods of the same size and configuration as standard Saxton fuel rods, but contain no fuel. The five dummy rods are orificed at the top and bottom end plugs to permit filling of the rod internal volume with primary coolant.

c. The remaining two rods will be internally pressurized Zircaloy-4 clad rods with nominal thickness of 23.5 mils containing enriched UO_2 fuel pellets (8.54% maximum U-235 enrichment) operating with tensile stresses of up to approximately 22,000 psi.

The test subassembly may be located in either of two peripheral core positions, N-3 or N-5, and may operate at power densities up to 19.1 kw/ft.

Test Fuel Assembly XXI

One 9 rod subassembly of standard pitch and array shall contain the following:

a. The center rod and 4 corner rods clad with type 304 stainless steel having a nominal thickness of 15 mils containing uranium dioxide (UO_2) uniformly enriched to 5.7 w/o U-235.

b. The remaining four rods will be internally pressurized Zircaloy-4 clad rods with nominal thickness of 23.5 mils containing enriched UO_2 fuel pellets (8.54% maximum U-235 enrichment) operating with tensile stresses of up to approximately 22,000 psi.

The test subassembly may be located in either of two peripheral core positions, N-3 or N-5, and may operate at power densities up to 19.1 kw/ft.

Test Fuel Assembly XXII

One 9 rod subassembly of standard pitch and array shall contain the following:

a. The four corner rods and the center rod clad with type 304 stainless steel having a nominal thickness of 15 mils and containing uranium dioxide (UO_2) pellets uniformly enriched to 5.7% U-235. These five rods are identical to standard fuel rods with the exception that the end closure welds are substandard for test purposes.

b. The remaining four rods will be any combination of the following:

1) Internally pressurized Zircaloy-4 clad rods with nominal thickness of 23.5 mils containing enriched UO_2 fuel pellets (8.54% maximum enrichment) operating with tensile stresses of up to approximately 22,000 psi.

2) Fuel rods clad with type 304 stainless steel having a nominal thickness of 15 mils and shall contain uranium dioxide (UO_2) pellets uniformly enriched to 5.7% U-235. These rods are identical to standard fuel rods with the exception that they are internally pressurized to produce maximum tensile stresses of approximately 36,000 psi during reactor operation.

The test subassembly may be located in either of two peripheral core positions, N-3 or N-5, and may operate at power densities up to 19.1 kw/ft.