5.2.1.2 REACTOR BUILDING

a. Nominal annular space = 5 feet.

b. Annulus nominal volume = 427,000 cubic feet.

c. Nominal outside height (measured from top of foundation base to the top of the dome) = 177 feet.

d. Nominal inside diameter = 125 feet.

e. Cylinder wall minimum thickness = 3 feet.

f. Dome minimum thickness = 2.25 feet.

g. Dome inside radius = 87 feet.

DESIGN PRESSURE AND TEMPERATURE

5.2.2 The reactor containment is designed and shall be maintained for a maximum internal pressure of 15.0 psig and a temperature of 250°F.

5.3 REACTOR CORE

REPLACE WITH INSERT A

FUEL ASSEMBLIES

~~5.3.1 The core shall contain 193 fuel assemblies with each fuel assembly containing 264 fuel rods clad with Zircaloy-4, except that limited substitutions of fuel rods by filler rods consisting of Zircaloy-4 or stainless steel, or by vacancies, may be made in peripheral fuel assemblies if justified by cycle-specific reload analyses. Each fuel rod shall have a nominal active fuel length of 144 inches and contain a maximum total weight of 1766 grams uranium. Reload fuel shall be similar in physical design to the initial core loading and shall have a maximum enrichment of 4.0 weight percent U-235.~~

CONTROL ROD ASSEMBLIES

5.3.2 The core shall contain 53 full-length and no part-length control rod assemblies. The full-length control rod assemblies shall contain a nominal 142 inches of absorber material. The nominal values of absorber material for Unit 1 control rods shall be 80% silver, 15% indium, and 5% cadmium. The nominal values of absorber material for Unit 2 control rods shall be 100% boron carbide (B_4C) for 102 inches and 80% silver, 15% indium, and 5% cadmium for the 40-inch tip. All control rods shall be clad with stainless steel tubing.

INSERT A

5.3.1 The core shall contain 193 fuel assemblies with each fuel assembly nominally containing 264 fuel rods clad with Zircaloy-4, except that substitutions of fuel rods by filler rods consisting of Zircaloy-4 or stainless steel, or by vacancies, may be made in fuel assemblies if justified by cycle-specific reload analyses using NRC-approved methodology. Should more than 30 rods in the core, or 10 rods in any assembly, be replaced per refueling, a special report describing the number of rods replaced will be submitted to the commission pursuant to Specification 6.9.2 within 30 days after cycle startup. Each fuel rod shall have a nominal active fuel length of 144 inches. Reload fuel shall be similar in physical design to the initial core loading and shall have a maximum enrichment of 4.0 weight percent U-235.

ATTACHMENT 1B

Revised Proposed Catawba Unit 1 and 2
Technical Specification Changes

DESIGN PRESSURE AND TEMPERATURE

5.2.2 The reactor containment vessel is designed and shall be maintained for a maximum internal pressure of 15 psig and a temperature of 328°F.

5.3 REACTOR CORE

REPLACE WITH INSERT B

FUEL ASSEMBLIES

~~5.3.1 The core shall contain 193 fuel assemblies with each fuel assembly containing 264 fuel rods clad with Zircaloy-4. Each fuel rod shall have a nominal active fuel length of 144 inches. The initial core loading shall have a maximum enrichment of 3.5 weight percent U-235. Reload fuel shall be similar in physical design to the initial core loading and shall have a maximum nominal enrichment of 4.0 weight percent U-235 with a maximum enrichment tolerance of ± 0.05 weight percent U-235.~~

CONTROL ROD ASSEMBLIES

5.3.2 The core shall contain 53 full-length control rod assemblies. The full-length control rod assemblies shall contain a nominal 142 inches of absorber material of which 102 inches shall be 100% boron carbide and remaining 40-inch tip shall be 80% silver, 15% indium, and 5% cadmium. All control rods shall be clad with stainless steel tubing.

5.4 REACTOR COOLANT SYSTEM

DESIGN PRESSURE AND TEMPERATURE

5.4.1 The Reactor Coolant System is designed and shall be maintained:

a. In accordance with the Code requirements specified in Section 5.2 of the FSAR, with allowance for normal degradation pursuant to the applicable Surveillance Requirements,

b. For a pressure a 2485 psig, and

c. For a temperature of 650°F, except for the pressurizer which is 680°F.

VOLUME

5.4.2 The total water and steam volume of the Reactor Coolant System is 12,040 ± 100 cubic feet at a nominal T_{avg} of 525°F.

5.5 METEOROLOGICAL TOWER LOCATION

5.5.1 The meteorological tower shall be located as shown in Figure 5.1-1.

INSERT B

5.3.1 The core shall contain 193 fuel assemblies with each fuel assembly nominally containing 264 fuel rods clad with Zircaloy-4, except that substitutions of fuel rods by filler rods consisting of Zircaloy-4 or stainless steel, or by vacancies, may be made in fuel assemblies if justified by cycle-specific reload analyses using NRC-approved methodology. Should more than 30 rods in the core, or 10 rods in any assembly, be replaced per refueling, a special report describing the number of rods replaced will be submitted to the commission pursuant to Specification 6.9.2 within 30 days after cycle startup. Each fuel rod shall have a nominal active fuel length of 144 inches. Reload fuel shall be similar in physical design to the initial core loading and shall have a maximum enrichment of 4.0 weight percent U-235 with a maximum enrichment tolerance of ± 0.05 weight percent U-235.

ATTACHMENT 2

Revised Justification and Safety Analysis Section

I. Broader scope of modifications allowed to fuel assemblies (McGuire):

As a result of fuel assembly problems due to "baffle jetting" at peripheral assemblies discovered during the McGuire Unit 1/Cycle 4 reload, McGuire Units 1 and 2 Technical Specification 5.3.1 was revised to provide for limited substitutions of fuel rods by filler rods (consisting of zircaloy-4 or stainless steel) or vacancies in peripheral fuel assemblies if justified by cycle-specific reload analyses (ref. Amendments 60(Unit 1)/41(Unit 2)). The proposed revision to this specification basically eliminates the "limited substitutions" and "peripheral fuel assemblies" provisos (along with specifying the justifying analyses' qualifications and requiring the reporting of any abnormal amounts of substitutions), thus expanding the use of fuel rod substitutions provided the substitutions are justified by a cycle-specific reload analysis using NRC-approved methodology (note that no new types of substitutions/modifications are proposed). The proposed wording changes are being requested to allow more flexibility in loading pattern designs and repair of leaking or damaged fuel rods (in addition to damage resulting from "baffle jetting") during a refueling outage. Such repairs could range from replacement of a single failed rod to "recaging" an entire fuel assembly.

For each fuel cycle an analysis is performed to ensure that, with each reload of fuel, all core design safety criteria are met. Westinghouse, McGuire and Catawba's current core designer, performs these cycle specific core design and safety analyses in accordance with their safety evaluation methodology (WCAP 9272-P-A). In the case where fuel assemblies are repaired, appropriate safety analyses will be conducted in conjunction with the normal reload analysis, verifying that all applicable core safety limits for fuel rods in the vicinity of the missing or substituted rods are still met. By modeling based on the exact substitution, an accurate and complete safety analysis can be performed, and conformance with established safety margins will be ensured. These analyses and the core reload changes are reviewed by Duke Power Company as required by 10CFR 50.59. If a change to technical specifications or an unreviewed safety question is identified then appropriate changes and analyses will be provided to the NRC for review and approval.

The "limited substitutions" and "peripheral fuel assemblies" provisos of the current specification are reflective of the fact that the previous amendments were related to specific modifications involving "baffle jetting" at peripheral core locations. However, fuel rod failures due to causes other than "baffle jetting" can occur and consequently require repair (for example, replacement of leaking fuel rods with stainless steel rods may be necessary to meet INPO and Duke Power Company fuel performance goals and would result in reduced radiation exposure to Duke personnel in subsequent outages). The term "limited substitutions" is unnecessary since the acceptability of any fuel rod substitutions would be determined by the justifying analyses (i.e. there is no inherent technical limitation as to the quantity of fuel rod substitutions). Similarly, there is no inherent technical reason any fuel rod substitutions should be limited to peripheral fuel assemblies, as any such limitations would again be determined by the justifying analyses. A similar technical specification change was previously approved on Point Beach Units 1 and 2 (ref. facility operating license nos. DPR-24 and DPR-27, Amendment Nos. 108 and 111).

The qualifier "using NRC-approved methodology" is added to the specification to alleviate NRC concerns regarding the type of analysis or methodology used to justify any fuel assembly modifications. The proposed wording clarifies/ensures that the effects of pin removal/replacement will be analyzed or evaluated on a cycle specific basis (e.g. via cycle-specific reload safety evaluation) using the same NRC-approved methodology and design limits that apply to any reload core. Precedence for the use of the "using NRC-approved methodology" analysis qualifier is contained in current McGuire Units 1 and 2 Technical Specification 3.9.12 (ref. Amendments 69 (Unit 1)/50(Unit 2)).

The requirement to report fuel rod replacement for more than 30 rods in the core or 10 rods in any assembly per refueling is included to ensure the NRC is advised of abnormal fuel performance. The reporting threshold criteria are based on Duke Power Company's experience that fuel rod replacements for more than 30 rods in the core, or 10 rods in any one assembly, is indicative of abnormal fuel performance. The proposed Technical Specification change would require fuel rod replacement in excess of these numbers to be reported within 30 days after cycle startup.

In summary, the proposed rewording allows for removal of damaged or failed fuel rods where cycle specific analyses are performed to demonstrate that the safety limits of the core reload are still satisfied.

ATTACHMENT 3

Revised Analysis of Significant Hazards Consideration Section

I. Broader scope of modifications allowed to fuel assemblies (McGuire):

The proposed revision to McGuire Units 1 and 2 Technical Specifications Design Features Section 5.3.1 basically eliminates unnecessary restrictions as to quantity and location (as well as clarifying the type of justifying analysis and adding reporting requirements) to more generally allow certain modifications to fuel assemblies involving the fuel rod locations providing they are justified by appropriate safety analyses. This revision is an administrative type change enabling the specification to better allow the various potential fuel assemblies and loading patterns that could be determined acceptable for utilization in the McGuire Units 1 and 2 cores. The proposed amendment itself does not constitute a significant hazards consideration since it is administrative in nature and does not represent an actual modification to the plant or change to its safety analyses. The proposed wording of the specification merely provides a broader blanket under which any future specific modifications to the plant or changes to its safety analyses may be performed, while still requiring that any such modifications/changes meet the same standards and criteria that they would have been subject to if they were proposed on an individual basis. Consequently, since appropriate standards/criteria will continue to be met, the proposed change itself does not involve a significant hazards consideration (any future specific modifications/changes performed in accordance with the provisions of this specification would be subject to individual assessment of unreviewed safety question/significant hazards consideration as warranted).

The first criterion is not violated. The present Technical Specification allows for fuel rod substitution or vacancies. While the proposed change alleviates certain restrictions specified for such cases, the more important requirement of satisfying a core specific reload analysis remains in effect. By taking into account any fuel rod substitutions or vacancies, that analysis will verify that all applicable safety margins as defined in the licensing documents are not reduced. Therefore, there can be no increase in the probability or consequences of an analyzed accident.

Similarly, the second criterion is not violated. While fuel assemblies containing the rod substitution or vacancies represent a change in the physical core configuration, it is a physical change which is no more significant than, for example, using fuel of a different enrichment from a previous cycle. Any such changes will be accounted for in the reload analysis. The proposed change merely states that rod substitution or vacancies must be justified by reload analysis. Given successful completion of such an analysis, it is not possible to create a new or different kind of accident.

The third criterion is also not violated for the same reasons described above. If the physical parameters of the reload core are evaluated as being within previously defined acceptance criteria, then a reduction in the margin of safety is precluded.

The commission has provided examples of amendments likely to involve no significant hazards considerations (48FR14870). One example of this type is (vi), "A change which either may result in some increase to the probability or consequences of a previously analyzed accident or may reduce in some way a safety margin, but where results of the change are clearly within all acceptable criteria with respect to the system or component specified in the standard review plan: for example, a change resulting from the application of a small refinement of a previously used calculational model or design method". This example can be applied to the revision of the Design Features specification allowing a broader scope of modifications to fuel assemblies since the specification requires that the results of any change performed under the provisions of the specification be justified by appropriate analyses using NRC-approved methodology (i.e. within acceptance criteria).

A second commission provided example of actions not likely to involve a significant hazards consideration is (iii), "For a nuclear power reactor, a change resulting from a nuclear reactor core reloading, if no fuel assemblies significantly different from those found previously acceptable to the NRC for a previous core at the facility in question are involved. This assumes that no significant changes are made to the acceptance criteria for the technical specifications, that the analytical methods used to demonstrate conformance with the technical specifications and regulations are not significantly changed, and that the NRC has previously found such methods acceptable." Duke Power Company believes that the proposed change to the Technical Specifications falls within the bounds of this example. It is emphasized that there are no changes to the acceptance criteria for the Technical Specifications. All safety-related criteria presently existing and found acceptable by the NRC will remain in effect.

A further commission provided example is (ii), "A change that constitutes an additional limitation, restriction, or control not presently included in the technical specifications: for example, a more stringent surveillance requirement." This example can be applied to the added reporting requirements provision since no reporting requirements are in the current specification, and also to the clarification of the type of justifying analysis performed to support any fuel assembly modifications.