ATTACHMENT I TO IPN-97-083

PROPOSED TECHNICAL SPECIFICATION CHANGE

RELATED TO

FUEL RECONSTITUTION

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
DPR-64

5.3 REACTOR

Applicability

Applies to the reactor core, and reactor coolant system.

Objective

To define those design features which are essential in providing for safe system operations.

A. Reactor Core

1. The reactor core contains approximately 89 metric tons of uranium in the form of slightly enriched uranium dioxide pellets. The pellets are encapsulated in Zircaloy-4 or ZIRLO™ tubing to form fuel rods. The reactor core is made up of 193 fuel assemblies. Limited substitutions of zirconium alloy or stainless steel filler rods for fuel rods, in accordance with approved applications of fuel rod configurations, may be used. Fuel assemblies shall be limited to those fuel designs that have been analyzed with applicable NRC staff approved codes and methods and shown by tests or analyses to comply with all fuel safety design bases.

2. The average enrichment of the initial core was a nominal 2.8 weight percent of U-235. Three fuel enrichments were used in the initial core. The highest enrichment was a nominal 3.3 weight percent of U-235.[2]

3. Reload fuel will be similar in design to the initial core. The enrichment of reload fuel will be no more than 5.0 weight percent of U-235.

4. Burnable poison rods were incorporated in the initial core. There were 1434 poison rods in the form of 8, 9, 12, 16, and 20-rod clusters, which are located in vacant rod cluster control guide tubes.[3] The burnable poison rods consist of borosilicate glass clad with stainless steel.[4] Burnable poison rods of an approved design may be used in reload cores for reactivity and/or power distribution control.

5. There are 53 control rods in the reactor core. The control rods contain 142 inch lengths of silver-indium-cadmium alloy clad with the stainless steel.[5]

B. Reactor Coolant System

1. The design of the reactor coolant system complies with the code requirements.[6]

2. All piping, components and supporting structures of the reactor coolant system are designed to Class I requirements, and have been designed to withstand the maximum potential seismic ground acceleration, 0.15g, acting in the horizontal and 0.10g acting in the vertical planes simultaneously with no loss of function.

3. The nominal liquid volume of the reactor coolant system, at rated operating conditions and with 0% equivalent steam generator tube plugging, is 11,522 cubic feet.

Basis

The fuel assembly reconstitution methodology, WCAP 13060-P-A, has been NRC staff approved as shown by tests or analyses to comply with all fuel safety design bases.

References

(1) FSAR Section 3.2.2

(2) FSAR Section 3.2.1

(3) FSAR Section 3.2.1

(4) FSAR Section 3.2.3

(5) FSAR Sections 3.2.1 & 3.2.3

(6) FSAR Table 4.1-9

ATTACHMENT II TO IPN-97-083

PROPOSED TECHNICAL SPECIFICATION CHANGE

RELATED TO

FUEL RECONSTITUTION

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
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Section I - Description of Change

This application for amendment to the Indian Point 3 Technical Specifications proposes a change to the reactor core fuel assembly design features requirements contained in Technical Specification 5.3.A.1, "Reactor Core" and associated basis. The proposed changes will allow the use of zirconium alloy or stainless steel filler rods in fuel assemblies to replace failed or damaged fuel rods, provided that the new fuel assembly configurations are analyzed with applicable NRC approved codes and methods. This submittal is in accordance with the guidance provided in Generic Letter 90-02, Supplement 1, "Alternative Requirements for Fuel Assemblies In Design Features Section of Technical Specifications."

Section II - Evaluation of Change

The proposed Technical Specification change is an improvement based on the guidance of generic letter (GL) 90-02, Supplement 1, "Alternative Requirements for Fuel Assemblies In Design Features Section of Technical Specifications." A change to the basis has been made to identify the methodology to be used for any new fuel assembly configuration and that it is NRC staff approved.

The present Technical Specification requirement for fuel assemblies specifies the quantity of fuel assemblies and the number of fuel rods per assembly. Flexibility to deviate from the number of fuel rods per assembly is desirable to permit removal of fuel rods that are found to be leaking, determined to be probable sources of future leakage, or damaged so that reuse of the majority of the affected fuel assembly is permitted with minimal impact on core design for the subsequent fuel cycle. This improvement may reduce the burden of future emergency Technical Specification changes due to the same circumstances.

The proposed change to allow reconstitution is consistent with the recommendation of GL 90-02, Supplement 1. Substitution is limited to zirconium alloy or stainless steel filler rods (i.e. no open water channels are permitted). Also, substitution must be in accordance with "NRC approved applications of fuel rod configurations." Generic Letter 90-02, Supplement 1 states:

> "The staff considers an NRC-approved methodology to be any methodology that the NRC staff has explicitly approved in a written safety evaluation or a plant-specific technical basis. That NRC-approved methodology must be used only for the purpose and the scope of application specified in the reviewed document as approved or modified in the NRC approval documentation."

Section III - No Significant Hazards Evaluation

Consistent with the requirements of 10 CFR 50.92, the enclosed application is judged to involve no significant hazards based on the following information:

(1) Does the proposed license amendment involve a significant increase in the probability or consequences of any accident previously evaluated?

Response:

The proposed changes modify the technical specification only to the extent that the reconstitution is recognized as acceptable under limited circumstances. Reconstitution is limited to substitution of zirconium alloy or stainless steel filler rods, and must be in accordance with approved applications of fuel rod configurations. Although these changes permit reconstitution to occur without the need for a specific technical specification change, use of an approved methodology is required prior to its application. Since the changes will allow substitution of filler rods for leaking, potentially leaking rods or damaged rods, the changes may actually reduce the radiological consequences of an accident. It is noted that the specific changes requested in this letter have previously been found acceptable by the NRC in GL 90-02, Supplement 1. For these reasons, we conclude that the changes will not involve a significant increase in the probability or consequences of an accident previously evaluated.

(2) Does the proposed license amendment create the possibility of a new or different kind of accident from any previously evaluated?

Response:

The proposed changes will not create the possibility of a new or different kind of accident from any accident previously evaluated because they will only affect the assembly configuration and can only be implemented if demonstrated to meet current plant requirements in accordance with an NRC-approved methodology. The other aspects of plant design, operation limitations, and responses to events will remain unchanged. It is noted that the changes have previously been determined acceptable by the NRC in GL 90-02, Supplement 1.

(3) Does the proposed amendment involve a significant reduction in a margin of safety?

Response:

The proposed change will not involve a reduction in a margin of safety because the changes can only be implemented if demonstrated to meet current plant requirements in accordance with an NRC-approved methodology. It is noted that the changes have previously been determined acceptable by the NRC in GL 90-02, Supplement 1.

<u>Section IV - Impact of Change</u>

This change will not adversely impact the following:

- ALARA Program
- Security and Fire Protection Programs
- Emergency Plan

- FSAR and SER Conclusions
- Overall Plant Operations and the Environment

Section V - Conclusions

The incorporation of this change: a) will not increase the probability nor the consequences of an accident or malfunction of equipment important to safety as previously evaluated in the Safety Analysis Report; b) will not increase the possibility for an accident or malfunction of a different type than any evaluated previously in the Safety Analysis Report; c) will not reduce the margin of safety as defined in the bases for any technical specification; d) does not constitute an unreviewed safety question; and e) involves no significant hazards considerations as defined in 10 CFR 50.92. This conclusion is predicated on the assumption that, as stated previously, the cycle specific Reload Safety Evaluation process will confirm that the reconstituted assembly satisfies the minimum DNBR acceptance limit, as well as all existing safety criteria.

ATTACHMENT III TO IPN-97-083

MARK UP OF TECHNICAL SPECIFICATION PAGES REGARDING

FUEL RECONSTITUTION

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
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5.3 REACTOR

Applicability

Applies to the reactor core, and reactor coolant system.

Objective

To define those design features which are essential in providing for safe system operations.

A. Reactor Core

1. The reactor core contains approximately 89 metric tons of uranium in the form of slightly enriched uranium dioxide pellets. The pellets are encapsulated in Zircaloy-4 or ZIRLO™ tubing to form fuel rods. The reactor core is made up of 193 fuel assemblies. ~~Each fuel assembly contains 204 fuel rods,[1] except during Cycle 9 and Cycle 10 operation. For Cycle 9 and Cycle 10 operation only, fuel assemblies W51 and W06 will each contain one stainless steel filler rod in place of a fuel rod.~~ **Limited substitutions of zirconium alloy or stainless steel filler rods for fuel rods, in accordance with approved applications of fuel rod configurations, may be used. Fuel assemblies shall be limited to those fuel designs that have been analyzed with applicable NRC staff approved codes and methods and shown by tests or analyses to comply with all fuel safety design bases.**

2. The average enrichment of the initial core was a nominal 2.8 weight percent of U-235. Three fuel enrichments were used in the initial core. The highest enrichment was a nominal 3.3 weight percent of U-235.[2]

3. Reload fuel will be similar in design to the initial core. The enrichment of reload fuel will be no more than 5.0 weight percent of U-235.

4. Burnable poison rods were incorporated in the initial core. There were 1434 poison rods in the form of 8, 9, 12, 16, and 20-rod clusters, which are located in vacant rod cluster control guide tubes.[3] The burnable poison rods consist of borosilicate glass clad with stainless steel.[4] Burnable poison rods of an approved design may be used in reload cores for reactivity and/or power distribution control.

5. There are 53 control rods in the reactor core. The control rods contain 142 inch lengths of silver-indium-cadmium alloy clad with the stainless steel.[5]

B. Reactor Coolant System

1. The design of the reactor coolant system complies with the code requirements.[6]

2. All piping, components and supporting structures of the reactor coolant system are designed to Class I requirements, and have been designed to withstand the maximum potential seismic ground acceleration, 0.15g, acting in the horizontal and 0.10g acting in the vertical planes simultaneously with no loss of function.

3. The nominal liquid volume of the reactor coolant system, at rated operating conditions and with 0% equivalent steam generator tube plugging, is 11,522 cubic feet.

~~Basis~~

~~The DNBR for Cycles 9 and 10 reconstituted fuel assemblies W51 and W06 will be conservatively determined by assuming the stainless steel replacement rods are operating at the highest power in the reconstituted fuel assemblies.~~

Basis

The fuel assembly reconstitution methodology, WCAP 13060-P-A, has been NRC staff approved as shown by tests or analyses to comply with all fuel safety design bases.

References

(1) FSAR Section 3.2.2

(2) FSAR Section 3.2.1

(3) FSAR Section 3.2.1

(4) FSAR Section 3.2.3

(5) FSAR Sections 3.2.1 & 3.2.3

(6) FSAR Table 4.1-9