ATTACHMENT I TO IPN-90-040

PROPOSED TECHNICAL SPECIFICATION CHANGES

REGARDING CYCLE 8 RECONSTITUTED FUEL ASSEMBLY

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 87 metric tons of uranium in the form of slightly enriched uranium dioxide pellets. The pellets are encapsulated in Zircaloy-4 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 8 operation. For Cycle 8 operation only, fuel assembly T53 will contain two stainless steel filler rods in place of two fuel rods.

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 4.5 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 Cycle 8 reconstituted fuel assembly T53 will be conservatively determined by assuming the stainless steel replacement rods are operating at the highest power in the reconstituted fuel assembly.

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-90-040

SAFETY EVALUATION

REGARDING CYCLE 8 RECONSTITUTED FUEL ASSEMBLY

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

The proposed change to Indian Point 3 Technical Specification 5.3.A.1 permits the replacement, for Cycle 8 operation only, of two fuel rods located in assembly T53 with two stainless steel filler rods. The reconstituted fuel assembly will be located in the core center, location H08.

A basis section has been added to address the Commission's requirement that the Departure from Nucleate Boiling Ratio (DNBR) for the reconstituted fuel assembly be conservatively determined by assuming the stainless steel replacement rods are operating at the highest power in the reconstituted assembly.

Section II - Evaluation of Changes

Existing Specification 5.3.A.1 states that each assembly contains 204 fuel rods. For Cycle 8, the Authority proposes to use reconstituted fuel assembly T53 containing 202 fuel rods and 2 stainless steel rods. The acceptability of replacing fuel rods with stainless steel filler rods will be justified by a cycle-specific reload evaluation using an NRC approved methodology to ensure that the existing safety criteria and design limits are met.

As part of the cycle specific Reload Safety Evaluation (RSE) process to be performed by Westinghouse, the impact of the reconstituted assembly on Departure from Nucleate Boiling (DNB) will be evaluated. Westinghouse will determine the DNB ratio (DNBR) for the reconstituted assembly by assuming the filler rods are operating at the highest power in the reconstituted fuel assembly. Utilizing this extremely conservative assumption, the predicted DNBR for the reconstituted assembly will be shown to satisfy the minimum DNBR acceptance limit. This approach is consistent with the methodology Westinghouse utilizes to evaluate reloads, as described in the NRC approved topical report WCAP-9273A (Reference 3). The results of the DNBR evaluation will be documented in the Indian Point 3 RSE for Cycle 8.

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 an accident previously evaluated?

Response:

The proposed changes regarding the replacement of fuel rods with stainless steel filler rods in a fuel assembly will not adversely affect plant system operations, functions or setpoints. The proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated. The acceptability of replacing fuel rods with stainless steel filler rods will be justified by a cycle-specific reload evaluation using an NRC approved methodology to ensure that the existing safety criteria and design limits are met. The reload evaluation will address the effect of the actual reconstitution on core performance parameters, peaking factors, and core average linear heat rate effects to ensure that the existing safety criteria and design limits are met, and original fuel assembly design criteria are satisfied.

As part of the cycle specific Reload Safety Evaluation (RSE) process to be performed by Westinghouse, the impact of the reconstituted assembly on the departure from nucleate boiling (DNB) will be evaluated. Westinghouse will determine the DNB ratio (DNBR) for the reconstituted assembly by assuming the filler rods are operating at the highest power in the reconstituted fuel assembly. Utilizing this extremely conservative assumption, the predicted DNBR for the filler rods will be shown to satisfy the minimum DNBR acceptance limit. This approach is consistent with the methodology Westinghouse utilizes to evaluate reloads, as described in the NRC approved topical report WCAP-9273A (Reference 3). The results of the DNBR evaluation will be documented in the Indian Point 3 RSE for Cycle 8.

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

Response:

The proposed changes regarding the replacement of fuel rods with stainless steel filler rods in a fuel assembly will not adversely affect plant system operations, functions or setpoints. The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated. The acceptability of replacing fuel rods with stainless steel filler rods will be justified by a cycle-specific reload evaluation using an NRC approved methodology to ensure that the existing safety criteria and design limits are met. The reload evaluation will address the effect of the actual reconstitution on core performance parameters, peaking factors, and core average linear heat rate effects to ensure that the existing safety criteria and design limits are met, and original fuel assembly design criteria are satisfied.

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

Response:

The proposed changes regarding the replacement of fuel rods with stainless steel filler rods in a fuel assembly will not adversely affect plant system operations, functions or setpoints. The proposed change does not involve a significant reduction in a margin of safety. The acceptability of replacing fuel rods with stainless steel filler rods will be justified by a cycle-specific reload evaluation using an NRC approved methodology to ensure that the existing safety criteria and design limits are met. The reload evaluation will address the effect of the actual reconstitution on core performance parameters, peaking factors, and core average linear heat rate effects to ensure that the existing safety criteria and design limits are met, and original fuel assembly design criteria are satisfied.

Section IV - Impact of Change

This change will not adversely impact the following:

ALARA Program

Security and Fire Protection Programs
Emergency Plan
FSAR or 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.

Section VI - References

1. IP-3 FSAR
2. IP-3 SER
3. WCAP-9273A, "Westinghouse Reload Safety Evaluation Methodology," July 1985.