

April 26, 1990

Docket No. 50-333

Mr. John C. Brons
Executive Vice President - Nuclear Generation
Power Authority of the State of New York
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White Plains, New York 10601

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Dear Mr. Brons:

SUBJECT: ISSUANCE OF AMENDMENT (TAC NO. 75870)

The Commission has issued the enclosed Amendment No.158 to Facility Operating License No. DPR-59 for the James A. FitzPatrick Nuclear Power Plant. The amendment consists of changes to the Technical Specifications in response to your application transmitted by letter dated January 12, 1990.

The amendment replaces the existing Reactor Vessel Pressure-Temperature Limit curves with new curves for operation to 12, 14 and 16 effective full power years and revises the corresponding Limiting Condition for Operation and Bases section to reflect the new pressure-temperature limits.

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular bi-weekly Federal Register notice.

Sincerely,

Original signed by

David E. LaBarge, Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 158 to DPR-59
2. Safety Evaluation

cc: w/enclosures
See next page

OFC	:PDI-1	:PDI-1	:EMTB	:OGC	:PDI-1	:
NAME	:CVogan	:DLaBarge/Bah	:CYCheng	:	:RACapra	:
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James FitzPatrick Nuclear
Power Plant

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

POWER AUTHORITY OF THE STATE OF NEW YORK

DOCKET NO. 50-333

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 158
License No. DPR-59

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Power Authority of the State of New York (the licensee) dated January 12, 1990, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-59 is hereby amended to read as follows:

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(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 158, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance to be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Robert A. Capra, Director
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 26, 1990

ATTACHMENT TO LICENSE AMENDMENT NO. 158

FACILITY OPERATING LICENSE NO. DPR-59

DOCKET NO. 50-333

Revise Appendix A as follows:

Remove Pages

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136
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Insert Pages

vii
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137
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Amendment No. ~~14, 22, 48, 64, 72, 74, 88, 98, 109, 113, 116, 117, 137~~ , 158

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3.6 LIMITING CONDITIONS FOR OPERATION

3.6 REACTOR COOLANT SYSTEM

Applicability:

Applies to the operating status of the Reactor Coolant System.

Objective:

To assure the integrity and safe operation of the Reactor Coolant System.

Specification:

A. Pressurization and Thermal Limits

1. Reactor Vessel Head Stud Tensioning

The reactor vessel head bolting studs shall not be under tension unless the temperatures of the reactor vessel flange and the reactor head flange are at least 90°F.

2. In-Service Hydrostatic and Leak Tests

During in-service hydrostatic or leak testing the Reactor Coolant System pressure and temperature shall be on or to the right of curve A shown in Figure 3.6-1 Part 1, 2, or 3 and the maximum temperature change during any one hour period shall be:

4.6 SURVEILLANCE REQUIREMENTS

4.6 REACTOR COOLANT SYSTEM

Applicability:

Applies to the periodic examination and testing requirements for the Reactor Coolant System.

Objective:

To determine the condition of the Reactor Coolant System and the operation of the safety devices related to it.

Specification:

A. Pressurization and Thermal Limits

1. Reactor Vessel Head Stud Tensioning

When in the cold condition, the reactor vessel head flange and the reactor vessel flange temperatures shall be recorded:

- a. Every 12 hours when the reactor vessel head flange is $\leq 120^{\circ}\text{F}$ and the studs are tensioned.
- b. Every 30 minutes when the reactor vessel head flange is $\leq 100^{\circ}\text{F}$ and the studs are tensioned.
- c. Within 30 minutes prior to and every 30 minutes during tensioning of reactor vessel head bolting studs.

2. In-Service Hydrostatic and Leak Tests

During hydrostatic and leak testing the Reactor Coolant System pressure and temperature shall be recorded every 30 minutes until two consecutive temperature readings are within 5°F of each other.

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3.6 (cont'd)

- a. $\leq 20^{\circ}\text{F}$ when to the left of curve C.
- b. $\leq 100^{\circ}\text{F}$ when on or to the right of curve C.

3. Non-Nuclear Heatup and Cooldown

During heatup by non-nuclear means (mechanical), cooldown following nuclear shutdown and low power physics tests the Reactor Coolant System pressure and temperature shall be on or to the right of the curve B shown in Figure 3.6-1 Part 1, 2, or 3 and the maximum temperature change during any one hour shall be $\leq 100^{\circ}\text{F}$.

4. Core Critical Operation

During all modes of operation with a critical core (except for low power physics tests) the reactor Coolant System pressure and temperature shall be at or to the right of the curve C shown in Figure 3.6-1 Part 1, 2, or 3 and the maximum temperature change during any one hour shall be $\leq 100^{\circ}\text{F}$.

5. With any of the limits of 3.6.A.1 through 3.6.A.4 above exceeded, either

- a. restore the temperature and/or pressure to within the limits within 30 minutes, perform an engineering evaluation to determine the effects of the out-of-limit condition on the structural integrity of the reactor coolant system, and determine that the reactor coolant system remains acceptable for continued operations; or

4.6 (cont'd)

3. Non-Nuclear Heatup and Cooldown

During heatup by non-nuclear means, cooldown following nuclear shutdown and low power physics tests, the reactor coolant system pressure and temperature shall be recorded every 30 minutes until two consecutive temperature readings are within 5°F of each other.

4. Core Critical Operation

During all modes of operation with a critical core (except for low power physics tests) the reactor Coolant System pressure and temperature shall be recorded within 30 minutes prior to withdrawal of control rods to bring the reactor critical and every 30 minutes during heatup until two consecutive temperature readings are within 5°F of each other.

3.6 and 4.6 BASES (cont'd)

The expected neutron fluence at the reactor vessel wall can be determined at any point during plant life based on the linear relationship between the reactor thermal power output and the corresponding number of neutrons produced. Accordingly, neutron flux wires were removed from the reactor vessel with the surveillance specimens to establish the correlation at the capsule location by experimental methods. The flux distribution at the vessel wall and 1/4 thickness (1/4T) depth was analytically determined as a function of core height and azimuth to establish the peak flux location in the vessel and the lead factor of the surveillance specimens.

Regulatory Guide 1.99, Revision 2 is used to predict the shift in RT_{NDT} as a function of fluence in the reactor vessel beltline region. An evaluation of the irradiated surveillance specimens, which were withdrawn from the reactor in April, 1985 (6 EFPY), shows a shift in RT_{NDT} less than that predicted by Regulatory Guide 1.99, Revision 2.

Operating limits for the reactor vessel pressure and temperature during normal heatup and cooldown, and during in-service hydrostatic and leak testing were established using 10 CFR 50 Appendix G, May, 1983 and Appendix G of the Summer 1984 Addenda to Section III of the ASME Boiler and Pressure Vessel Code. These operating limits assure that the vessel could safely accommodate a postulated surface flaw having a depth of 0.24 inch at the flange-to-vessel junction, and one-quarter of the material thickness at all other reactor vessel locations and discontinuity regions. For the purpose of setting these operating limits, the reference temperature, RT_{NDT} , of the vessel material was estimated from impact test data taken in accordance with the requirements of the Code to which the vessel was designed and manufactured (1965 Edition including Winter 1966 addenda). The RT_{NDT} values for the reactor

vessel flange region and for the reactor vessel shell beltline region are 30°F, based on fabrication test reports. The RT_{NDT} for the remainder of the vessel is 40°F.

The first surveillance capsule containing test specimens was withdrawn in April, 1985 after 6 EFPY. The test specimens removed were tested according to ASTM E 185-82 and the results are in GE report MDE-49-0386. The next surveillance capsule will be removed after 15 EFPYs of operation and the results of the examination used as a basis for revision of Figure 3.6-1 curves A, B and C for operation of the plant after 16 EFPYs.

Figure 3.6-1 is comprised of three parts: Part 1, Part 2, and Part 3. Parts 1, 2, and 3 establish the pressure-temperature limits for plant operations through 12, 14, and 16 Effective Full Power Years (EFPY) respectively. The appropriate figure and the pressure-temperature curves are dependent on the number of accumulated EFPY. Figure 3.6-1, Part 1 is for operation through 12 EFPY, Figure 3.6-1, Part 2 is for operation at greater than 12 EFPY through 14 EFPY, and Figure 3.6-1, Part 3 is for operation at greater than 14 EFPY through 16 EFPY. The curves contained in Figure 3.6-1 are developed from the General Electric Report DRF 137-0010, "Implementation of Regulatory Guide 1.99, Revision 2 for the James A. FitzPatrick Nuclear Power Plant," dated June, 1989.

Figure 3.6-1 curve A establishes the minimum temperature for hydrostatic and leak testing required by the ASME Boiler and Pressure Vessel Code, Section XI. Test pressures for in-service hydrostatic and leak testing are a function of the testing temperature and the component material. Accordingly, the maximum hydrostatic test pressure will be 1.1 times the operating pressure or about 1105 psig.

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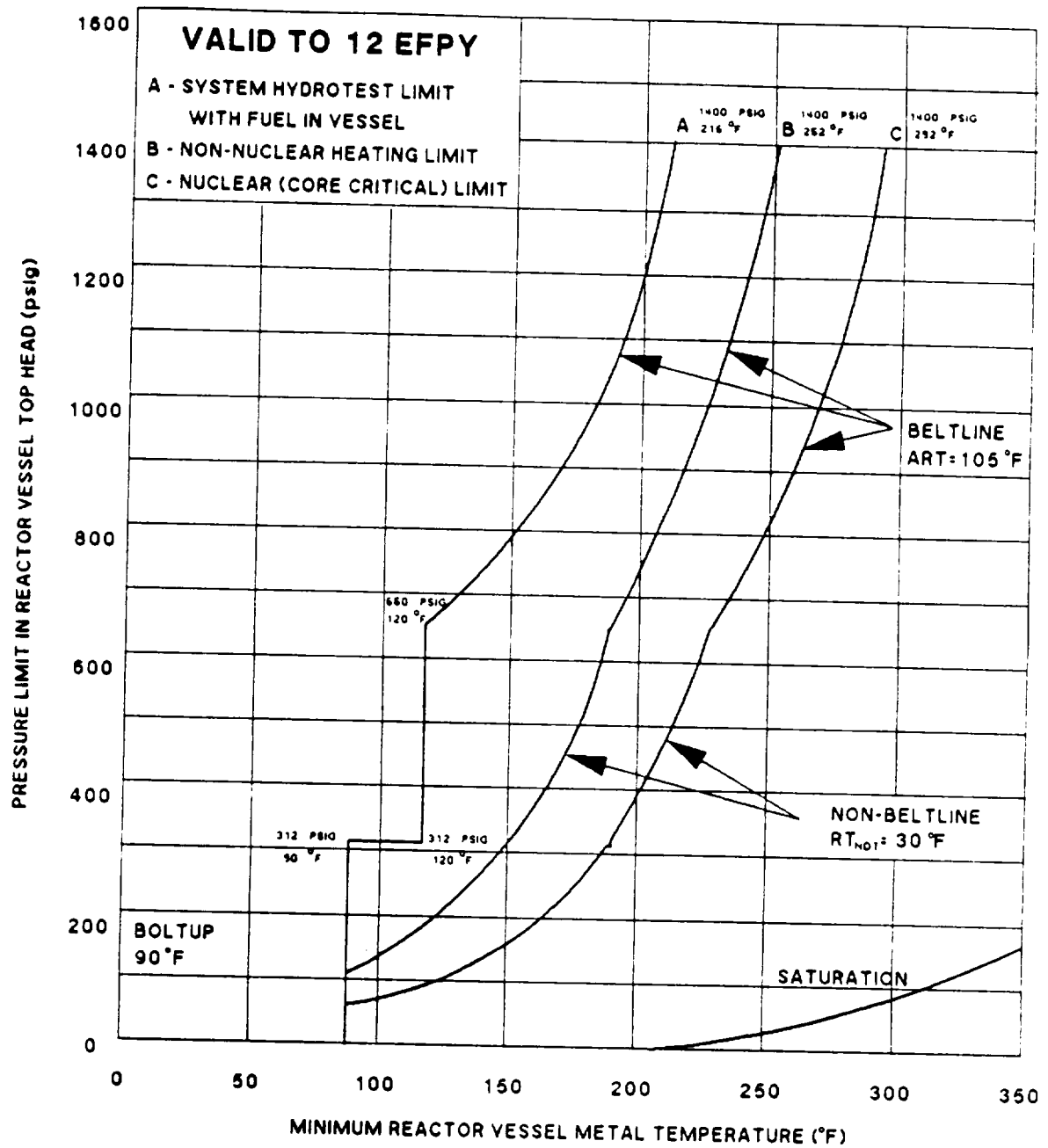


Figure 3.6-1 Part 1 Reactor Vessel Pressure-Temperature Limits Through 12 EFPY

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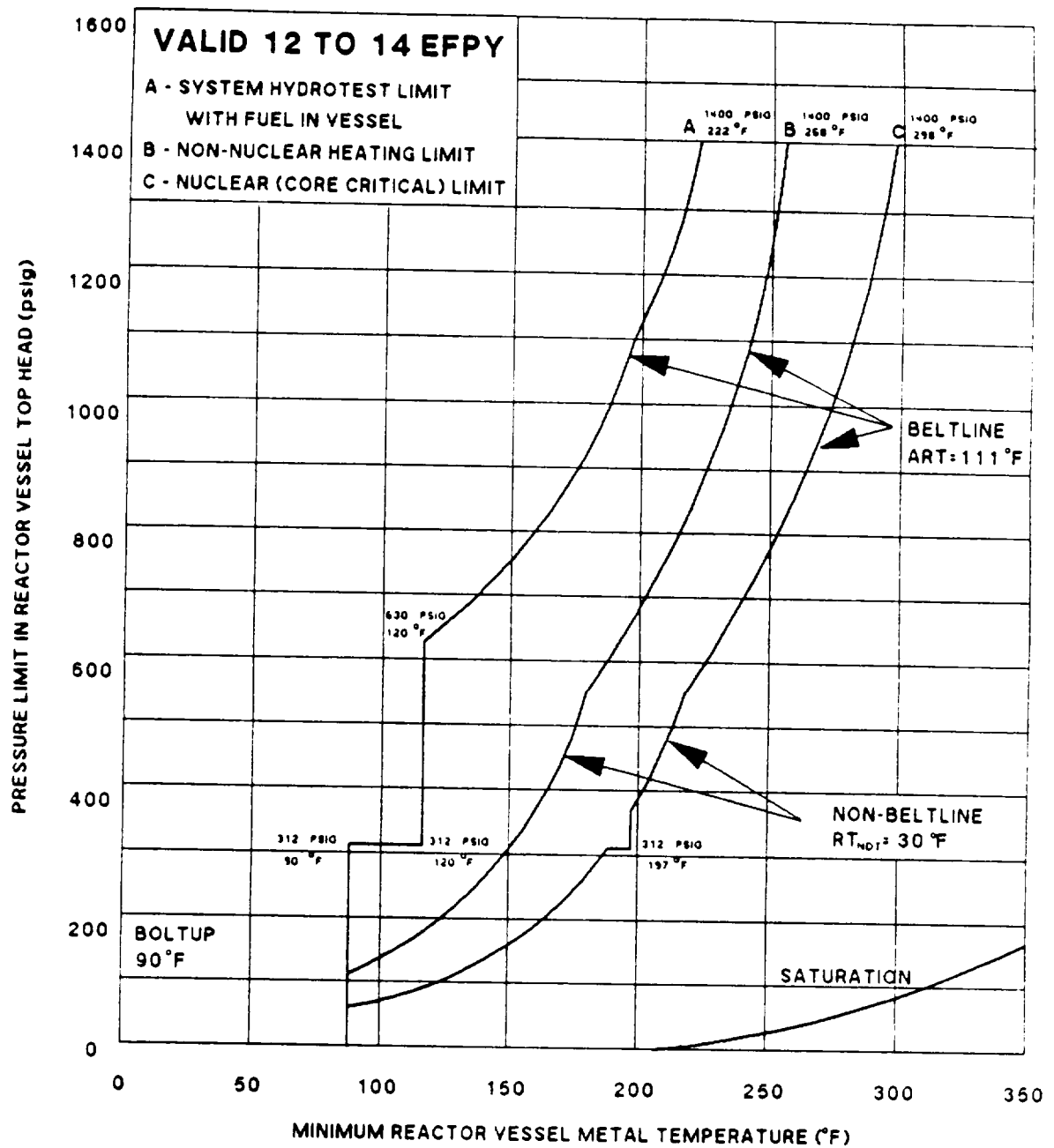


Figure 3.6- 1 Part 2 Reactor Vessel Pressure-Temperature Limits Through 14 EFPY

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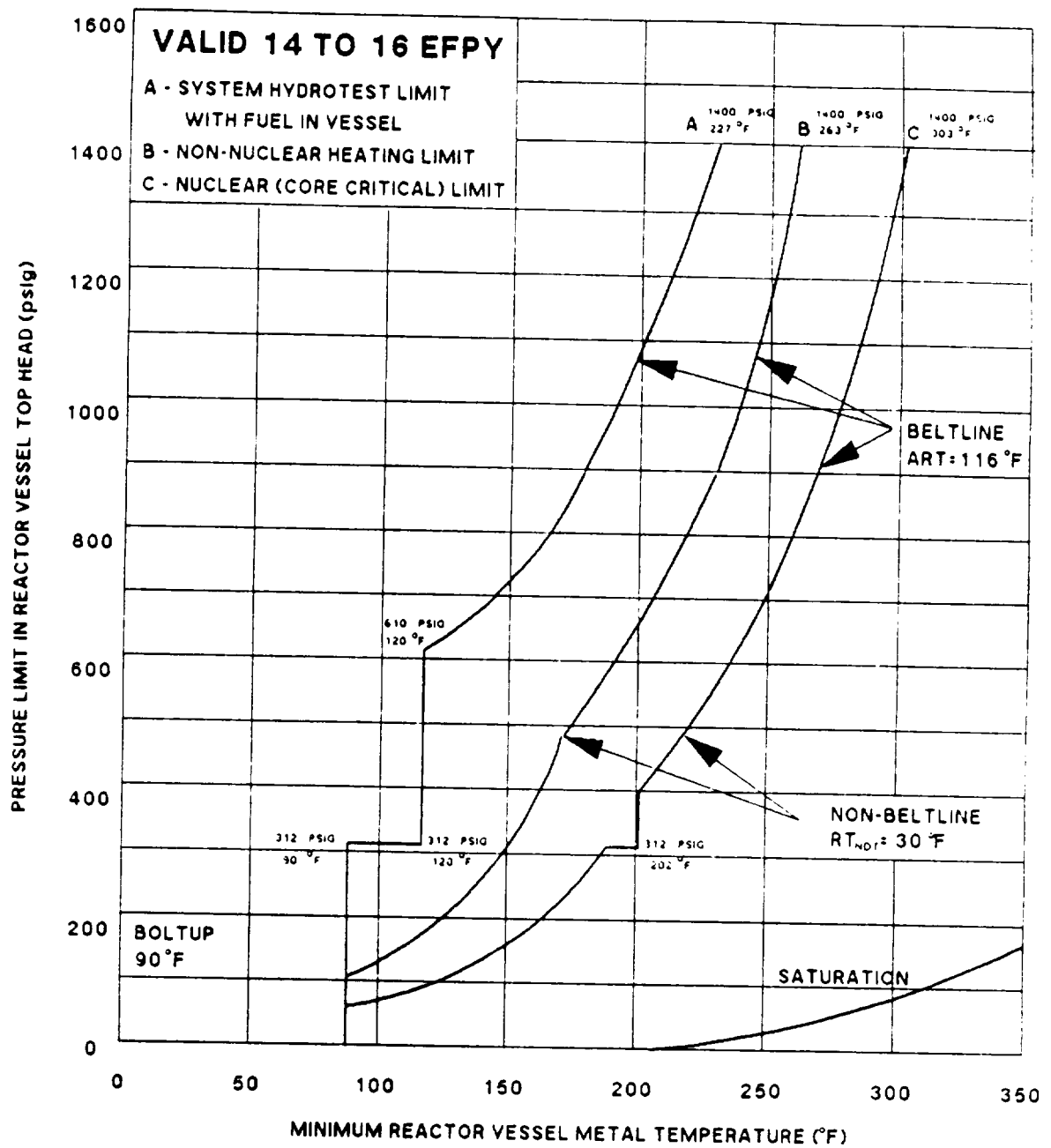


Figure 3.6-1 Part 3 Reactor Vessel Pressure-Temperature Limits Through 16 EFPY

163b

Amendment No. 158



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 158 TO FACILITY OPERATING LICENSE NO. DPR-59

POWER AUTHORITY OF THE STATE OF NEW YORK

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

DOCKET NO. 50-333

INTRODUCTION

By letter dated January 12, 1990, the Power Authority of the State of New York (PASNY or the licensee) submitted an amendment request to the Technical Specifications (TS) for the James A. FitzPatrick Nuclear Power Plant. The amendment would replace the present pressure-temperature curves of Figure 3.6-1 with new curves, which would be applicable for plant operation to 12, 14 and 16 Effective Full Power Years (EFPY). In addition, wording changes to the affected Limiting Conditions for Operation (LCOs) and Bases to reflect the new curves were proposed.

DESCRIPTION

Prior to initial startup, surveillance capsules are installed in the reactor vessel which contain test specimens that are made from the plate, weld, and heat affected zone materials of the reactor vessel beltline. They are removed at specified intervals of plant operation and analyzed to determine the magnitude of the effects of irradiation on the reactor vessel material. As reactor operation continues, the radiation effects inherently result in embrittlement of the reactor vessel materials. To account for these effects, the minimum temperature at which the reactor vessel is allowed to be pressurized, the nil-ductility reference temperature, is increased at various intervals, depending on the test specimen analysis results. Presentation of the results of this analysis is in the form of a graph with various curves which define the minimum pressure for various temperatures under which various plant conditions (hydrostatic testing with fuel in the reactor vessel limit, non-nuclear heating limit, and nuclear (critical) limit) may be allowed to exist.

Amendment No. 113, issued October 22, 1987, revised the pressure-temperature limit curves which were in effect at the time to be consistent with test results and analysis performed on the irradiated surveillance capsule removed from the reactor vessel in April 1985. The instructions in Regulatory Guide 1.99, Revision 1, were used to adjust the nil-ductility reference temperature and determine the curve limits in Amendment No. 113 to prevent operation in regions where this shift toward embrittlement would be a concern.

Regulatory Guide 1.99, Revision 2, dated May 1988, revised the methodology used to evaluate the effects of neutron radiation embrittlement. Generic Letter (GL) 88-11, issued July 12, 1988, requested licensees to use this revision of the regulatory guide to evaluate the predicted irradiation effects. PASNY responded to this GL by letter dated June 30, 1989. By letter dated March 28, 1990, the staff indicated that the response and the proposed pressure-temperature limit curves were acceptable. These are the same curves which have been submitted for this amendment.

Based on the analysis already performed which indicated that the new curves were in compliance with the latest guidance on determining the irradiation effects on the reactor vessel and, therefore, acceptance of the curves, the staff finds this amendment acceptable. Also, the other changes which were necessary to describe the new curves have been reviewed and are acceptable.

ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Sec 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: April 26, 1990

PRINCIPAL CONTRIBUTOR:

D. LaBarge