

January 7, 1991

Docket No. 50-412
Serial No. BV-90-026

Mr. J. D. Sieber, Vice President
Nuclear Group
Duquesne Light Company
Post Office Box 4
Shippingport, Pennsylvania 15077

Dear Mr. Sieber:

SUBJECT: AMENDMENT NO. 36 TO FACILITY OPERATING LICENSE NPF-73:
PRESSURE-TEMPERATURE LIMITS - CHANGE REQUEST 40 (TAC NO. 76890)

The Commission has issued the enclosed Amendment No. 36 to Facility Operating License No. NPF-73 for the Beaver Valley Power Station, Unit 2, in response to your application dated June 11, 1990 (Change Request No. 40).

The amendment modifies the Appendix A Technical Specifications (TSs) for the reactor coolant system (RCS) heatup and cooldown curves. Specifically, the amendment incorporates revised Figures 3.4-2 and 3.4-3. These revised curves are applicable to 10 effective full-power years (EFPY), and have been developed consistent with the recommendations of Regulatory Guide (RG) 1.99 (Rev. 2).

A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Albert W. De Agazio, Senior Project Manager
Project Directorate I-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 36 to NPF-73
2. Safety Evaluation

cc w/enclosures:
See next page

OFC	:PDI-4:LA	:PDI-4:PM	:PDI-4:D	:OGC <i>Tahle</i>	:
NAME	: <i>SNorris</i>	:ADeAgazio:cn	:JFStolz <i>Rutz</i>	: <i>WAS</i>	:
DATE	: <i>12/12/90</i>	: <i>12/19/90</i>	: <i>12/19/90</i>	: <i>12/24/90</i>	:

OFFICIAL RECORD COPY
Document Name: 76890 AMENDMENT

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PDR ADDCK 05000412
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cc:

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

DUQUESNE LIGHT COMPANY

OHIO EDISON COMPANY

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

THE TOLEDO EDISON COMPANY

DOCKET NO. 50-412

BEAVER VALLEY POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 36
License No. NPF-73

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Duquesne Light Company, et al. (the licensee) dated June 11, 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.

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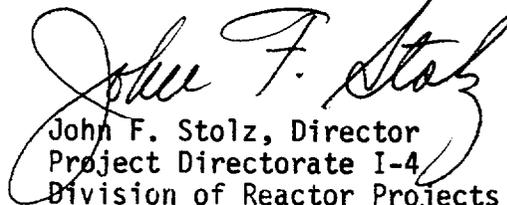
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-73 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 36, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto are hereby incorporated in the license. DLCO shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance, to be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



John F. Stolz, Director
Project Directorate I-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: January 7, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 36

FACILITY OPERATING LICENSE NO. NPF-73

DOCKET NO. 50-412

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Remove

3/4 4-31
3/4 4-32

Insert

3/4 4-31
3/4 4-32

MATERIAL PROPERTY BASIS

CONTROLLING MATERIAL: INTERMEDIATE SHELL PLATE B9004-1

INITIAL RT_{NDT}: 60°F

RT_{NDT} AFTER 10 EPFY: 1/4T, 140°F
 3/4T, 129°F

CURVES APPLICABLE FOR HEATUP RATES UP TO 60°F/HR FOR THE SERVICE PERIOD UP TO 10 EPFY. CONTAINS MARGIN OF 10°F AND 60 PSIG FOR POSSIBLE INSTRUMENT ERRORS.

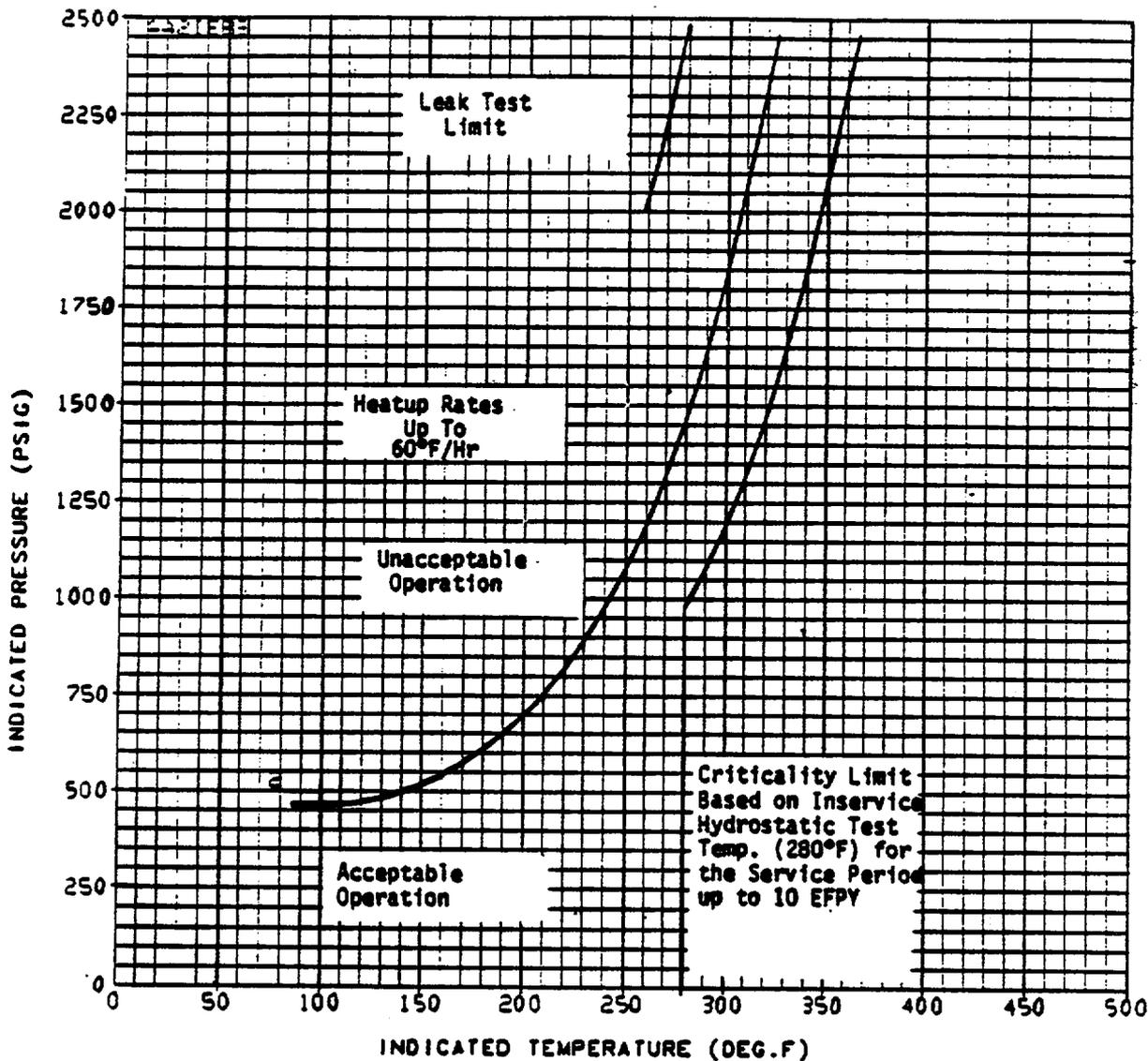


FIGURE 3.4-2 BEAVER VALLEY UNIT 2 REACTOR COOLANT SYSTEM HEATUP LIMITATIONS APPLICABLE FOR THE FIRST 10 EPFY

MATERIAL PROPERTY BASIS

CONTROLLING MATERIAL: INTERMEDIATE SHELL PLATE B9004-1

INITIAL RT_{NDT}: 60°F

RT_{NDT} AFTER 10 EPFY: 1/4T, 140°F

3/4T, 129°F

CURVES APPLICABLE FOR COOLDOWN RATES UP TO 100 °F/HR FOR THE SERVICE PERIOD UP TO 10 EPFY. CONTAINS MARGIN OF 10°F AND 60 PSIG FOR POSSIBLE INSTRUMENT ERRORS.

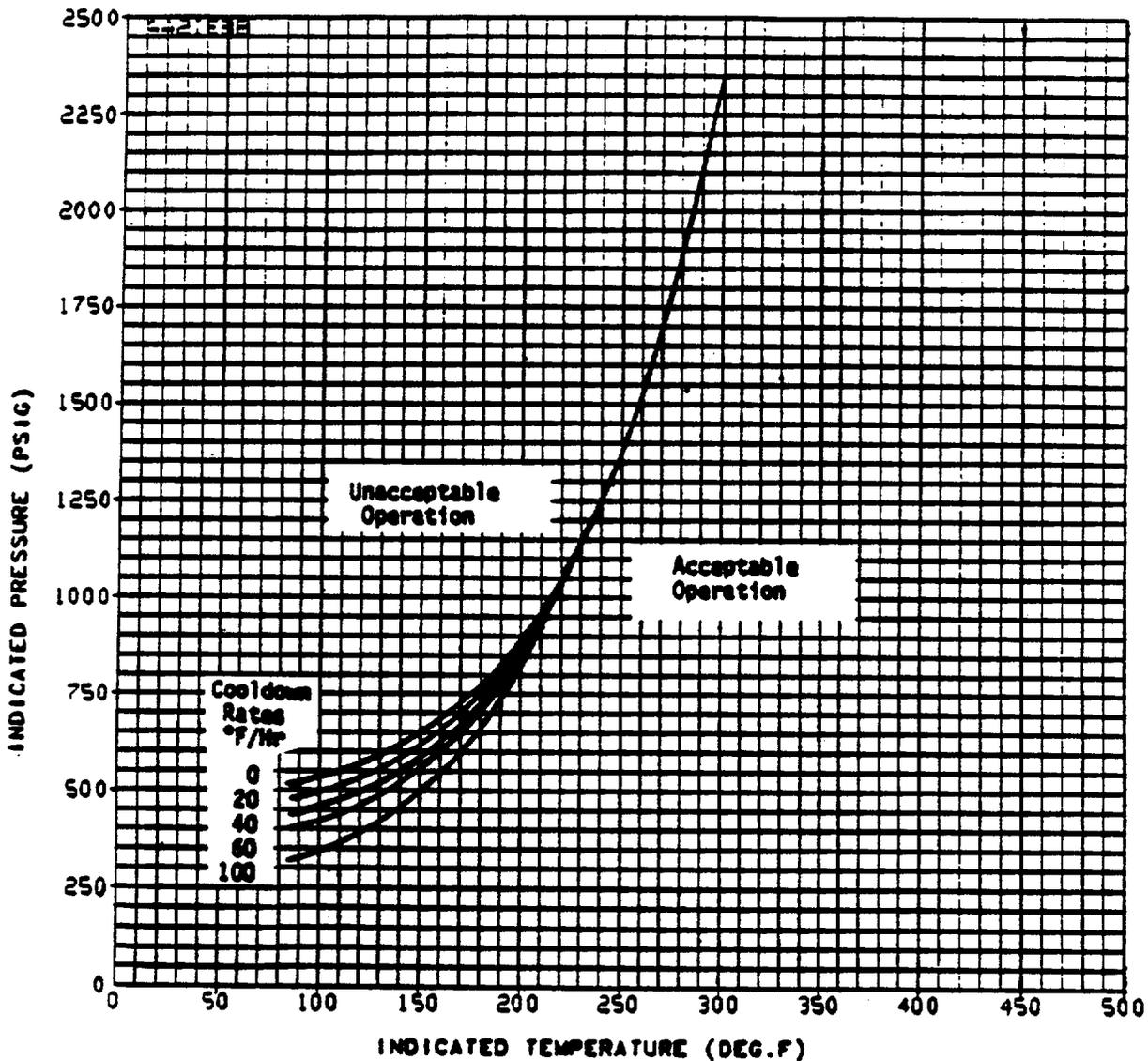


FIGURE 3.4-3 BEAVER VALLEY UNIT NO. 2 REACTOR COOLANT SYSTEM COOLDOWN LIMITATIONS APPLICABLE FOR THE FIRST 10 EPFY



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 36 TO FACILITY OPERATING LICENSE NO. NPF-73

DUQUESNE LIGHT COMPANY

OHIO EDISON COMPANY

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

THE TOLEDO EDISON COMPANY

BEAVER VALLEY POWER STATION, UNIT NO. 2

DOCKET NO. 50-412

1.0 INTRODUCTION

By letter dated June 11, 1990, (Ref. 1) Duquesne Light Company proposed a revision to the pressure/temperature (P-T) limits in the Beaver Valley Power Station, Unit 2 (BVPS-2) Technical Specifications, Section 3.4 (Ref. 2). This revision changes the P-T limits from 5 to 10 effective full power years (EFPY). The proposed P-T limits were developed based on Regulatory Guide (RG) 1.99, Revision 2, (Ref. 3) and they provide limits for the operation of the reactor coolant system during heatup, cooldown, criticality, and hydrotest.

To evaluate the P-T limits, we used the following NRC regulations and guidance: Appendices G and H of 10 CFR Part 50; the ASTM Standards and the ASME Code, which are referenced in Appendices G and H; 10 CFR 50.36(c)(2); RG 1.99, Rev. 2; Standard Review Plan (SRP) Section 5.3.2 (Ref. 4); and Generic Letter 88-11 (Ref. 5).

Each licensee authorized to operate a nuclear power reactor is required by 10 CFR 50.36 to provide technical specifications for the operation of the plant. In particular, 10 CFR 50.36(c)(2) requires that limiting conditions of operation be included in the technical specifications. The P-T limits are among the limiting conditions of operation in the technical specifications for all commercial nuclear plants in the U.S. Appendices G and H of 10 CFR Part 50 describe specific requirements for fracture toughness and reactor vessel material surveillance that must be considered in setting P-T limits. An acceptable method for constructing the P-T limits is described in SRP Section 5.3.2.

Appendix G of 10 CFR Part 50 specifies fracture toughness and testing requirements for reactor vessel materials in accordance with the ASME Code and, in particular, that the beltline materials in the surveillance capsules be tested in accordance with Appendix H of 10 CFR Part 50. Appendix H, in turn, refers to ASTM Standards. These tests define the extent of vessel

embrittlement at the time of capsule withdrawal in terms of the increase in reference temperature. Appendix G also requires the licensee to predict the effects of neutron irradiation on vessel embrittlement by calculating the adjusted reference temperature (ART) and Charpy upper shelf energy (USE). Generic Letter 88-11 requested that licensees and permittees use the methods in RG 1.99, Rev. 2, to predict the effect of neutron irradiation on reactor vessel materials. This guide defines the ART as the sum of unirradiated reference temperature, the increase in reference temperature resulting from neutron irradiation, and a margin to account for uncertainties in the prediction method.

Appendix H of 10 CFR Part 50 requires the licensee to establish a surveillance program to withdraw periodically surveillance capsules from the reactor vessel. Appendix H refers to the ASTM Standards which require that the capsules be installed in the vessel before startup and that they contain test specimens made from plate, weld, and heat-affected-zone (HAZ) materials of the reactor beltline.

2.0 DISCUSSION AND EVALUATION

We have evaluated the effect of neutron irradiation embrittlement on each beltline material in the Beaver Valley Unit 2 reactor vessel. The amount of irradiation embrittlement was calculated in accordance with RG 1.99, Rev. 2. We have determined that the material with the highest ART at 10 EFPY at the 1/4T and 3/4T (T = reactor vessel beltline thickness) locations was intermediate shell plate B9004-1 with 0.07% copper (Cu), 0.53% nickel (Ni), and an initial RT_{ndt} of 60°F.

Duquesne Light Company has removed surveillance capsule U from the BVPS-2 reactor vessel after 1.24 EFPY. The encapsulated specimens were tested, and the results were reported in WCAP-12406. We have reviewed WCAP-12406 and conclude that it satisfies the reporting requirement in 10 CFR 50 Appendix H. We also have determined that all surveillance capsules contained Charpy impact specimens and tensile specimens made from base metal, weld metal, and HAZ metal.

For the limiting beltline material, plate B9004-1, we calculated the ART to be 140.4°F at 1/4T and 128.6°F at 3/4T. The staff used a neutron fluence of 1.22E19 n/cm² at 1/4T and 4.66E18 n/cm² at 3/4T.

Duquesne Light Company used the method in RG 1.99, Rev. 2, to calculate an ART of 140°F at 1/4T and 129°F at 3/4T for the same limiting metal. Substituting the ART of 140.4°F into equations in SRP 5.3.2, we verified that the proposed P-T limits for heatup, cooldown, and hydrotest meet the beltline material requirements in Appendix G of 10 CFR Part 50.

In addition to beltline materials, Appendix G of 10 CFR Part 50 also imposes P-T limits based on the reference temperature for the reactor vessel closure flange materials. Section IV.2 of Appendix G states that when the pressure exceeds 20% of the preservice system hydrostatic test pressure, the temperature of the closure flange regions highly stressed by bolt preload must exceed the reference temperature of the material in those regions by at least

120°F for normal operation and by 90°F for hydrostatic pressure tests and leak tests. Based on the flange reference temperature of 0°F, we have determined that the proposed P-T limits satisfy Section IV.2 of Appendix G.

Section IV.B of Appendix G requires that the predicted Charpy USE at end of life be above 50 ft-lb. The material with the lowest initial USE is plate B9004-2 with an initial USE of 75.5 ft-lb. Using the method in RG 1.99, Rev. 2, the predicted Charpy USE of the plate at the end of life will be greater than 50 ft-lb and, therefore, is acceptable.

We find that the proposed P-T limits for the reactor coolant system for heatup, cooldown, leak test, and criticality are valid through 10 EFPY because the limits conform to the requirements of Appendices G and H of 10 CFR Part 50. Duquesne Light Company's submittal also satisfies Generic Letter 88-11 because the method in RG 1.99, Rev. 2, was used to calculate the ART. Hence, the proposed P-T limits as represented on revised Figures 3.4-2 and 3.4-3 may be incorporated into the BVPS-2 Technical Specifications.

3.0 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. We have 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 staff 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, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 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 the amendment.

4.0 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 (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: January 7, 1991

Principal Contributor: John Tsao

5.0 REFERENCES

1. June 11, 1990, Letter from J. D. Sieber (Duquesne Light Company) to USNRC Document Control Desk, Subject: Beaver Valley Power Station, Unit 2, Proposed Operating License Change Request No. 40 (TAC NO. 76890).
2. Beaver Valley Unit 2 Technical Specifications.
3. Regulatory Guide 1.99, Radiation Embrittlement of Reactor Vessel Materials, Revision 2, May 1988.
4. NUREG-0800, Standard Review Plan, Section 5.3.2 Pressure-Temperature Limits.
5. Generic Letter 88-11, NRC Position on Radiation Embrittlement of Reactor Vessel Materials and Its Impact on Plant Operations, USNRC, July 12, 1988.