UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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. 258
License No. DPR-59

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by The Power Authority of the State of New York (the licensee) dated June 22, 1999, 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:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 258 , 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 and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Sheri R. Peterson

Sheri R. Peterson, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: November 29, 1999

ATTACHMENT TO LICENSE AMENDMENT NO. 258

FACILITY OPERATING LICENSE NO. DPR-59

DOCKET NO. 50-333

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

Remove Pages	Insert Pages
vii	vii
136	136
137	137
146	146
147	147
148	148
163	163
163a	163a
163b	163b

LIST OF FIGURES

Figures	Title	Page
4.1-1	(Deleted)	
4.2-1	(Deleted)	
3.4-1	Sodium Pentaborate Solution (Minimum 34.7 B-10 Atom % Enriched) Volume-Concentration Requirements	110
3.4-2	Saturation Temperature of Enriched Sodium Pentaborate Solution	111
3.5-1	(Deleted)	
3.6-1 Part 1	Reactor Vessel Pressure - Temperature Limits Through 24 EFPY	163
3.6-1 Part 2	Reactor Vessel Pressure - Temperature Limits Through 32 EFPY	163a
3.6-1 Part 3	(Deleted)	163b
4.6-1	(Deleted)	
6.1-1	(Deleted)	
6.2-1	(Deleted)	

Amendment No. ~~14, 22, 43, 64, 72, 74, 88, 98, 109, 113, 116, 117, 134, 137, 158, 162, 227, 236,~~ ~~247~~, 258

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 or 2 for the flange and the beltline region, and on or to the right of curve A_{NB} for the non-beltline regions, and on or to the right of curve A_{BH} for the bottom head region. 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 ≤120°F and the studs are tensioned.

b. Every 30 minutes when the reactor vessel head flange is ≤100°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.

3.6 (cont'd)

a. $\leq$20°F when to the left of curve C.

b. $\leq$100°F when on or to the right of curve C.

Specifications 3.5.C, 3.5.D, 3.5.E and 3.6.E which would become effective because of an increase in reactor coolant temperature above 212°F or pressures above 100 and 150 psig are not required while conducting the RCS hydrostatic pressure and leakage tests between 212°F and 300°F provided all control rods are fully inserted.

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 or 2 for the flange, upper vessel and beltline regions, and on or to the right of curve B_{BH} for the bottom head region. The maximum temperature change during any one hour shall be $\leq$100°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 or 2. The maximum temperature change during any one hour shall be $\leq$100°F.

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

A. Pressurization and Thermal Limits

The reactor vessel design specification requires that the reactor vessel be designed for a maximum heatup and cooldown rate of the contained fluid (water) of 100°F/hr averaged over a period of 1 hour. This rate has been chosen based on past experience with operating power plants. The associated time periods for heatup and cooldown cycles when the 100°F/hr rate is applied provide for efficient, but safe, plant operation.

The reactor vessel manufacturer has designed the vessel to the above temperature criterion. In the course of completing the design, the manufacturer performed detailed stress analysis. This analysis includes more severe thermal conditions than those which would be encountered during normal heating and cooling operations.

Specific analyses were made based on a heating and cooling rate of 100°F/hr applied continuously over a temperature range of 100°F to 546°F.

Calculated stresses were within 1965 ASME Boiler and Pressure Vessel Code, Section III, with 1966 addenda stress intensity and fatigue limits. The normal heating and cooling rate of 100°F/hr was also evaluated to assure protection against brittle fracture of the vessel shell remote from discontinuities. The rate meets the requirements of Appendix G to the Summer 1972 Edition of 1971 ASME III, throughout plant life, and is, therefore, satisfactory.

The limiting coolant temperature differential between the upper and lower regions of the reactor vessel, prior to recirculation pump operation, assures that the vessel bottom head region will not be warmed at an excessive rate due to rapid sweep-out of cold coolant in the vessel lower head region by recirculation pump operation (cold coolant can accumulate as a result of control rod drive inleakage and/or low recirculation flow rate during startup or hot standby). The limit on idle recirculation loop startup avoids high thermal stress effects in the pumps and piping, while also minimizing thermal stresses on the vessel nozzles.

The nil-ductility transition (NDT) temperature RT_{NDT} is defined as the temperature below which ferritic steel breaks in a brittle rather than ductile manner. Reactor vessel flux monitoring samples are installed to conform with the 1972 draft revision of ASTM E 185. Surveillance program test results have established the magnitude of changes in the NDT temperature as a function of the integrated neutron exposure for BWR vessels. The design life of the reactor vessel is 40 years, and the maximum fast neutron exposure at 40 years was originally calculated to be 7.0×10^{17} n/cm^2. Based on the surveillance program test results, the EOL fluence is now estimated to be 1.8×10^{18} n/cm^2.

Fast neutron irradiation affects the fracture toughness of the reactor vessel material. In order to assure that non-ductile failure does not occur, two types of information are needed:

a) a relationship between the change in RT_{NDT} and the accumulated fast neutron fluence, and,

b) a relationship between the neutron fluence at the point of peak flux in the reactor pressure vessel shell and the effective full power years.

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 (May 1988) is used to predict the shift in RT_{NDT} as a function of fluence in the reactor vessel beltline region. An evaluation of two sets of the irradiated surveillance specimens, which were withdrawn from the reactor in April, 1985 (6 EFPY) and November 1996 (13.4 EFPY), respectively, 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, December 1995, and Appendix G of Section XI of the ASME Boiler and Pressure Vessel Code (1989 Edition). 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 Section III of the ASME Boiler and Pressure Vessel Code to which the vessel was designed and manufactured (1965 Edition including Winter 1966 addenda). The RT_{NDT} values of the reactor vessel materials are listed on Table 3-2 of General Electric Report GE-NE-B1100732-01, "Plant FitzPatrick RPV Surveillance Materials Testing and Analysis of 120° Capsule at 13.4 EFPY," Revision 1 (February 1998), including Errata and Addenda dated June 1999.

The actual shift in the RT_{NDT} of the vessel material will be established periodically by removing and evaluating flux monitoring surveillance capsules in accordance with ASTM E 185-82 and 10 CFR 50, Appendix H. The evaluation findings and recommendations of Regulatory Guide 1.99 Revision 2 will provide the basis for revising Figure 3.6-1 curves A, B and C for operation of the plant. 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 second surveillance capsule containing test specimens was withdrawn in November, 1996 after 13.4 EFPY. The test specimens removed were tested according to ASTM E 185-82 and the results are in General Electric Report GE-NE-B1100732-01, Revision 1 (February 1998), including Errata and Addenda dated June 1999. The NRC approved schedule for subsequent specimen withdrawal is located in the updated FSAR (Section 4.2.7).

Figure 3.6-1 is comprised of two parts: Part 1 and Part 2. Part 1 establishes the pressure-temperature limits for the bottom head, flange, upper vessel and beltline regions for plant operations through 24 Effective Full Power Years (EFPY). Part 2 establishes the pressure-temperature limits for plant operations through 32 EFPY. The curves contained in Figure 3.6-1 are developed from the General Electric Report GE-NE-B1100732-01, Revision 1 (February 1998), including Errata and Addenda dated June 1999.

Figure 3.6-1 curves A, A_{BH}, and A_{NB} establish 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 1,144 psig.

3.6 and 4.6 BASES (cont'd)

Fig. 3.6-1, curves B and B_{BH}, provide limitations for plant heatup and cooldown when the reactor is not critical or during low power physics tests. The thermal limitation is based on maximum heatup and cooldown rates of 100°F/hr in any one-hour period.

Fig. 3.6-1, curve C, establishes operating limits when core is critical. These limits include a margin of 40°F as required by 10 CFR 50 Appendix G.

The requirements for cold boltup of the reactor vessel closure region are established based on RT_{NDT} plus 60°F. This factor is based on the original requirements of the ASME Code to which the vessel was built, as well as additional, conservative requiremements developed by General Electric that are typically applied to most BWRs. For Fig. 3.6-1, curves A, B, and C, this factor leads to the 90°F lower temperature limit. This limit is based on the closure flange materials maximum RT_{NDT} of 30°F, and the fact that the closure flange materials are not subjected to any appreciable neutron radiation exposure. Therefore, the minimum temperature for cold boltup is 30°F plus 60°F, or 90°F.

Specification 3.6.A.2 identifies four LCOs that become effective with increased reactor coolant temperature or pressure but are not in effect during the hydrostatic and leakage tests. This is necessary because, as reactor fluence increases, the minimum test temperature and pressure rises into ranges normally associated with startup or hot shutdown. RCS pressure and temperature are used throughout the Technical Specifications as a basis for establishing plant mode and system operability requirements.

Some LCOs and restrictions cannot be satisfied during the test at elevated temperatures. For example, Specifications 3.5.C.1 and 3.5.E.1 require that HPCI and RCIC be operable when reactor pressure exceeds 150 psig and 212°F. HPCI and RCIC cannot be made operable during the test because piping normally filled with steam is filled with water during the test.

Hydrostatic and leakage tests shall be terminated before the reactor coolant temperature exceeds 300°F. This temperature limit is based on providing at least a 50°F band for operating flexibility between the 300°F limit and the highest estimated minimum testing temperature at 32 EFPY (originally approximated as 250°F from testing of the first surveillance capsule). Based on the latest surveillance capsule test results, the minimum temperature required to stay on or to the right of curve A at the maximum test pressure is 212°F for 32 EFPY. The previously established hydrostatic test limitation of 300°F continues to provide adequate operating flexibility above this minimum temperature.

The protection provided by LCOs applicable during cold shutdown plus the requirement that all control rods be fully inserted are adequate to ensure protection of public health and safety. The hydrostatic test is performed once every 10 years while the leakage test is performed after each refueling when conditions are similar to cold shutdown (i.e., after the reactor has been shutdown and decay heat and the energy stored in the core is very low). The consequences of accidents (small and large break LOCAs, MSLB, etc.) are bounded by analyses that assume full power operation. Specification 3.5.A requires the low pressure ECCS systems to be operable. Specifications 3.7.A, 3.7.B and 3.7.C require the containment, SGTS and secondary containment to be operable. Specifications 3.2.A, 3.2.B and Appendix B, Specification 3.8 require instrumentation that initiate containment, low pressure ECCS, SBGT and secondary containment be operable. Emergency power is required by Specification 3.9.B.

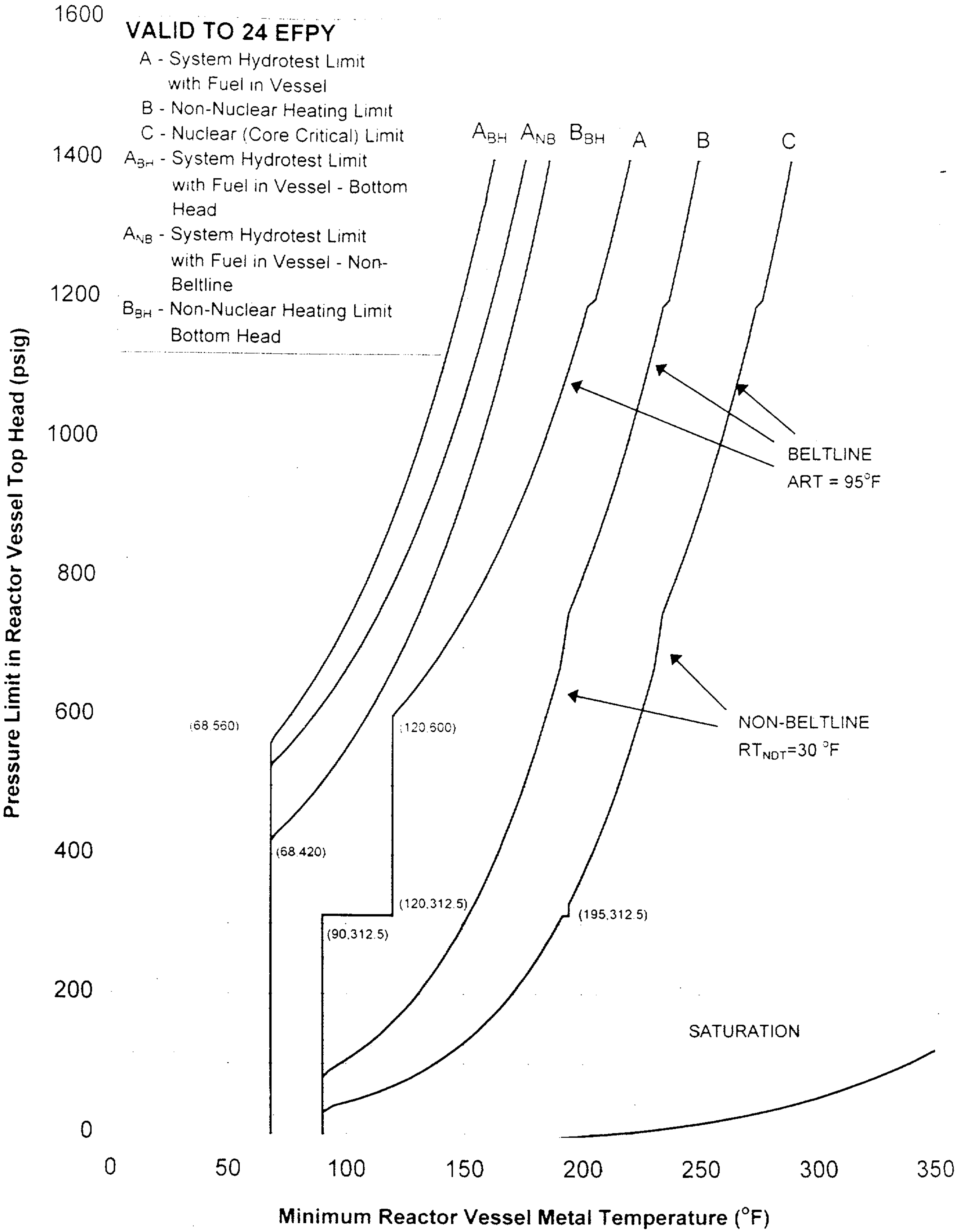

Figure 3.6-1 Part 1 Reactor Vessel Pressure-Temperature Limits Through 24 EFPY

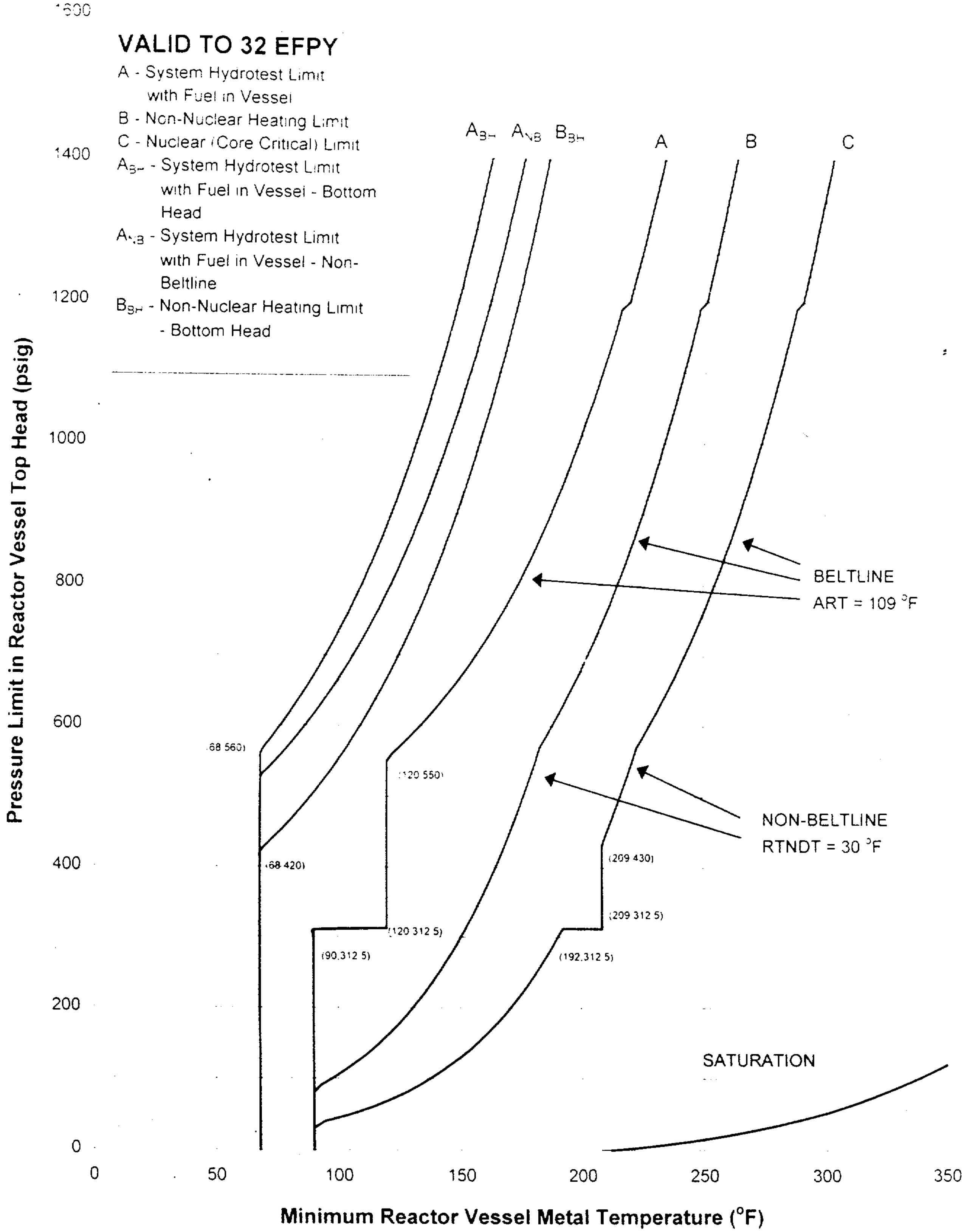

Figure 3.6-1 Part 2 Reactor Vessel Pressure-Temperature Limits Through 32 EFPY

THIS PAGE INTENTIONALLY LEFT BLANK