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ENCLOSURE

WATTS BAR NUCLEAR PLANT (WBN)  
PIPING ANALYSIS CODE CASES

Thermal expansion, dead load, and normal operational stresses due to system pressurization for Category I piping systems are analyzed in accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III, Division 1, Nuclear Power Plant Components, 1971 Edition, up to and including the Summer 1973 Addenda. Some classes of pipe are analyzed in conformance with American National Standards Institute (ANSI) B31.1, Power Piping Code, 1973 Edition up to and including Summer 1973 Addenda. In addition, TVA Class M (chilled water) piping conforms to ANSI B31.5, 1974.

As permitted by Section NA-1140 of the ASME piping code, the following sections of more recent editions and addenda of the ASME Boiler and Pressure Vessel Code and ASME code cases are used.

A. CODE EDITIONS AND ADDENDA

1. Stress Intensification Factors

- a. 1974 code, used for Stress Intensification Factors for Class 2 and Class 3 piping.

2. Nozzle Dimensions

- a. Figure NB-3686.1-1 for nozzle dimensions from the Summer 1975 Addenda.

3. Material Properties

- a. 1980 Edition - including Summer 1980 Addenda, Appendix I, Table I-4.0, for thermal conductivity and thermal diffusivity of materials.
- b. 1983 Edition - including Winter 1983 Addenda, Appendix I, Table I-5.0, for coefficient of thermal expansion of materials that are not available in the Code of Record.
- c. 1983 Edition - including Summer 1985 Addenda, Appendix I, Table I.6.0, for modulus of elasticity of materials that are not available in the Code of Record.
- d. 1983 Edition - including Summer 1985 Addenda, Appendix I, Tables I-1.1, I-1.2, I-1.3, I-2.1, I-2.2, I-3.1, I-3.2, I-7.1, I-7.2, I-7.3, and I-9.1 for materials that are not available in the Code of Record.

4. Stress Qualification

- a. 1980 Edition - up to and including Winter 1982 Addenda, Section III, Subsection NB, may be used for the stress qualification of Class 1 piping (NB-3600).
- b. 1974 Edition - Summer 1976 Addenda, Section III, Paragraph NB-3630 (d), used for Class 1 piping that can be analyzed in accordance with requirements of Subsection NC.
- c. 1974 Edition - Winter 1976 Addenda, Section III, Paragraph NC/ND-3611.2.
- d. 1977 Edition - Section III, Paragraph NC/ND-3652.3.

5. Welded Attachments

- a. 1980 Edition - Winter 1980 Addenda, Section III, Paragraph NB-4433 that permitted the use of continuous fillet or partial penetration welds for welded structural attachments (lugs) to the pipe.

6. Flange Qualification

- a. 1983 Edition - up to and including Winter 1983 Addenda, Section III, used for Class 1 flange qualification in accordance with NB-3658; used for Classes 2 and 3 flange qualification in accordance with NC-3658 and ND-3658.

7. Relief and Safety Valve Thrust

- a. 1977 Edition - Winter 1978 Addenda, Section III, Paragraph NC/ND-3622.5, and Appendix O.

B. Code Cases

1. Half-Coupling Branch Connections

- a. Code Case N-313, November 28, 1986, Alternate Rules for Half-Coupling Branch Connections, Section III, Division 1, Class 2.

2. Response Spectra

- a. Code Case N-411-1, February 20, 1986, Alternate Damping Values for Seismic Analysis of Classes 1, 2, and 3 Piping Systems, Section III, Division 1, may be used.

ENCLOSURE (Continued)

3. Stress Qualification

- a. Code Case 1606-1, December 16, 1974, Stress Criteria, Section III, Classes 2 and 3 Piping Subject to Upset, Emergency, and Faulted Operating Conditions.
- b. Code Case N-319, July 13, 1984, Alternate Procedure for Evaluation of Stresses in Butt Welding Elbows in Class 1 Piping.

4. Welded Attachments

- a. Code Case N-122, January 21, 1988, Stress Indices for Integral Structural Attachments, Section III, Division 1, Class 1.
- b. Code Case N-318-3, September 5, 1985, Procedure for Evaluation of the Design of Hollow Circular Cross Section Welded Attachments on Class 1 Piping, Section III, Division 1.
- c. Code Case N-391, November 28, 1983, Procedure for Evaluation of the Design of Hollow Circular Cross Section Welded Attachments on Class 1 Piping, Section III, Division 1.
- d. Code Case N-392, November 28, 1983, Procedure for Evaluation of the Design of Hollow Circular Cross Section Welded Attachments on Class 2 and Class 3 Piping, Section III, Division 1.