3.2 CLASSIFICATION OF STRUCTURES, COMPONENTS, AND SYSTEMS

Certain structures, components, and systems of a nuclear power plant are considered important because they perform safety functions required to avoid or mitigate the consequences of abnormal operational transients or accidents. This section discusses the classification of structures, components, and systems according to the importance of the safety function they perform. In addition, design requirements are placed upon such equipment to ensure the proper performance of safety actions when required.

3.2.1 Seismic Classification

3.2.1.1 Definition of Seismic Design Classifications

Structures and equipment have been divided into three classes for the purpose of establishing the seismic design requirements. Each structure, system, component, and parts thereof are classified in accordance with the following definitions.

<u>Class I</u>

Those structures and components, including instruments and controls, whose failure might cause or increase the severity of a loss-of-coolant accident or result in an uncontrolled release of excessive amounts of radioactivity. Also, those structures and components vital to safe shutdown and isolation of the reactor.

<u>Class II</u>

Those structures and components which are important to reactor operation but not essential to safe shutdown and isolation of the reactor, and whose failure could not result in the release of substantial amounts of radioactivity.

Class III

Those structures and components which are not related to reactor operation or containment.

Seismic design measures for these three classifications are described in Sections 3.7 and 5.2.

3.2.1.2 Seismic Classification of Structures, Systems, and Components

The classifications which follow are intended, by example, to convey the application of the seismic classification definitions.

Class I

The following list establishes a general category of Class I items:

Structures:

1. Containment (including penetrations and air locks, the concrete shield, and the interior structures)

2. Fuel Handling Building

3. Control Room

4. Auxiliary Building

5. Service Water Intake Structure

Equipment, Piping, and Supports:

1. Reactor Protection System, portions of the Radiation Monitoring System

   System and Process Instrumentation and Controls as required for Class I equipment and systems

2. Reactor

   Vessel and its supports

   Vessel Internals

   Fuel Assemblies

   RCC assemblies and drive mechanisms

   Supporting and positioning members

   In-core instrumentation structure

3. Reactor Coolant System

   Piping and valves (including safety and relief valves)

   Steam Generators

   Pressurizer

   Reactor Coolant Pumps

   Reactor Coolant System supports

4. Chemical and Volume Control System (portions)

5. Engineered Safety Features

Emergency Core Cooling System (including Safety Injection and Residual Heat Removal Pumps, Refueling Water Storage Tank, Accumulators, Boron Injection Tank, Residual Heat Exchangers, connecting piping and valving)

Containment Spray System (including Spray Pumps, Spray Headers, Spray Additive Tank, and connecting piping and valving)

Containment Ventilation System (including fan coolers, distribution ducts, dampers, HEPA filters, and moisture separators)

6. Auxiliary Building Ventilation System (supply and exhaust units)

7. Fuel Handling Building Ventilation System (exhaust units)

8. Auxiliary Feedwater Storage Tanks

9. Residual Heat Removal System

10. Component Cooling System

11. Fuel Transfer Tube

12. Emergency Power Supply Systems

Diesel-Generators and associated fuel oil lubricating oil, starting auxiliary systems, fuel storage, and day tanks

Diesel-Generator Area Ventilation System

DC Power Supply System

Power distribution lines to equipment required for emergency transformers and switchgear supplying the Engineered Safety Features

Control Boards

Motor Control Centers

13. Control equipment, facilities and lines as required for the preceding items

14. Containment Polar Crane

15. Auxiliary Feedwater and Service Water Systems (portions)

16. Sampling System Piping (to outermost containment isolation valve)

17. Main Steam System (to isolation valve)

18. Feedwater System (to outermost containment isolation valve)

19. Combustible Gas Control System (partial)

20. Fuel Handling System

21. Instrumentation and Control Systems required for safe shutdown, including safety-related instrumentation

22. Electrical Cable Tunnels

23. Spent fuel pool cooling and purification system piping (SFPC components have been seismicly evaluated under SQUG GIP methodology).

QA program controls as identified in Section 17.2 are applied, but not limited to, the above Class I systems, structures, and components

Class II

The following list establishes a general category of Class II items:

1. Pressurizer Relief Tank
2. Sampling System (partial)
3. (This text has been deleted)
4. Holdup Tank Transfer Pumps
5. Evaporator
6. Evaporator Condensate Demineralizers
7. Waste Monitor Tanks
8. Waste Monitor Tank Pumps
9. Primary Water Storage Tanks
10. Concentrates Holdup Tank
11. Waste Gas Disposal System

Class III

The following list establishes a general category of Class III items:

1. Turbine Generator Area Structure
2. Buildings containing conventional facilities
3. Waste Disposal System (partial)

4. Chemical Mixing Tank

5. Resin Fill Tank

6. Demineralized Water Storage Tanks

7. Conventional equipment, tanks, and piping other than Classes I and II

3.2.1.3 Seismic Criteria

For Class I (seismic) equipment, dynamic methods or conservative static equivalents were used to determine that components and structures will operate or maintain their integrity, as required. For Class II (seismic) equipment, static methods were used and Class III (sesimic) equipment meets applicable codes.

3.2.2 System Quality Considerations

3.2.2.1 Codes and Standards

The codes and standards applied in the design of plant systems are described in the section of the FSAR containing the respective system description.

3.2.2.2 ANSI B31.7

ANSI B31.7 was used for piping design wherever possible. Where not possible to comply with ANSI B31.7, the requirements of ASME III - 1971 were adhered to.

The major deviations from ANSI B31.7 requirements involve radiographic inspection technique. The original edition of B31.7 was deficient in this area as evidenced by the need for ANSI B31 Code Case 72. The ANSI committee recognized that the radiographic requirements of B31.7 were not suitable for field radiography of thin walls and small diameter piping butt welds. The incorporation of Code Case 72, without change, into the 1971 edition of Section III of the ASME Boiler and Pressure Vessel Code and its retention up to the present edition demonstrates that it provides a realistic approach to field radiography.

In addition, radiographs of Nuclear Class 3 cement lined pipe were difficult to interpret. The 1970 addenda to B31.7 allowed 100 percent magnetic particle inspection in lieu of random radiography. This provision was also incorporated into Section III, 1971 Edition. The Service Water System contains Nuclear Class 3 cement lined pipe for which this alternate inspection method was utilized. In addition, the weld inspection criteria of later Editions and Addenda of ASME III, as approved by the NRC, can be specified.

The use of a later code was restricted to inspection and did not involve any requirements from Section III such as materials, stress calculations, etc, that would modify our original design. Consequently, other requirements from a later Code would not be applicable. Therefore, the integrity of field welds has not been compromised and Public Service Electric and Gas has complied with the commitment to use ANSI B31.7 wherever possible.

3.2.2.3 Field - Run Piping

Field running of small diameter piping, i.e., complete assembly at the erection point without reference to design drawings, is not permitted for essential systems. Therefore, no special quality assurance measures or performance tests are required.