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Washington, D.C. 20545

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APR 08 1983

50-537

Dr. J. Nelson Grace, Director
CRBR Program Office
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Dr. Grace:

RESPONSE TO SAFETY EVALUATION REPORT (SER) ITEM NO. 6 - QUALITY ASSURANCE (QA)

Enclosed are responses to recent questions raised in discussion with the Nuclear Regulatory Commission staff regarding the identification of safety-related structures, systems, and components controlled by the Clinch River Breeder Reactor Quality Assurance Program. The enclosed information should enable the staff to complete their review of the QA list and close out SER Open Item No. 6 listed in Section 1.6 of the SER. The enclosed Preliminary Safety Analysis Report (PSAR) change pages will be incorporated in the next scheduled PSAR amendment.

Any questions regarding the enclosed information may be addressed to Mr. D. Robinson (FTS 626-6098) of the Project Office Oak Ridge staff.

Sincerely,

John R. Longenecker
Acting Director, Office of
Breeder Demonstration Projects
Office of Nuclear Energy

Enclosure

cc: Service List
Standard Distribution
Licensing Distribution

D001

8304110667 830406
PDR ADOCK 05000537
E PDR

Quality Assurance Branch Questions:

Section 17.1.2.2 of the standard format (Regulatory Guide 1.70) requires the identification of safety-related structures, systems, and components controlled by the QA program. You are requested to supplement and clarify the CRBRP PSAR in accordance with the following:

- a. The following items do not appear on PSAR Table 3.2-1, 3.2-2, 3.2-3, or 7.1-1. Add the appropriate items to the appropriate table or justify not doing so.
 1. Instrumentation and Controls for the following systems:
 - o Annulus Filtration System
 - o Reactor Service Building Filtration System
 - o Steam Generator Building Aerosol Release Mitigation System
 - o Outlet Steam Isolation System
 - o Core Criticality Monitoring System
 - o Pressure Controlled Bypass Valves (AFW Pumps)
 - o AFW Isolation Valves & Pump Inlet Isolation Valves
 - o Steam - Feed Flow Mismatch & Steam Drum Level Interlock Subsystem
 - o Remote Shutdown System
 - o Emergency Plant Service Water System
 - o Emergency Chilled Water System
 - o Failed Fuel Monitoring System
 - Cover Gas Monitor
 - Delayed Neutron Monitor
 - Failed Fuel Location System
 - o Leak Detection Systems
 - o Sodium Water Reaction Pressure Relief System
 - o Containment Hydrogen Monitoring System
 - o Accident Monitoring System
 2. Reactor Service Building Filtration System
 3. Control Room Filtration System
 4. Radioactivity Monitoring (fixed and portable)
 5. Radioactivity Sampling (air, surfaces, liquids)
 6. Radioactive Contamination Measurement and Analysis

7. Personnel Monitoring Internal (e.g., whole body counter) and External (e.g., TLD system)
8. Instrument Storage, Calibration and Maintenance
9. Decontamination (facilities, personnel and equipment)
10. Respiratory Protection, Including Testing
11. Contamination Control
12. Radiation Shielding
13. Standby AC Auxiliary Power Systems (Class 1E)
 - o Diesel generator packages including auxiliaries (e.g., lube system, jacket cooling, air start systems, governor, voltage regulatory and excitation system).
 - o Instrumentation, control and power cables (including underground cable system, cable splices, connectors and terminal blocks).
 - o Conduit and cable trays and their supports containing Class 1E cables and other raceway installations whose failure may damage other safety-related items.
 - o Valve operators
 - o Protective relays and control panels
 - o Electrical penetration for containment - vital and non-vital including primary and backup fault current protective devices.
 - o Emergency lighting battery packs
 - o AC vital bus distribution equipment
14. DC Power Systems (Class 1E)
 - o Cables
 - o Conduit and cable trays and their supports containing 1E cables and other raceway installations whose failure may damage other safety-related items.
 - o Battery racks
 - o DC switchgear, distribution panels and protective relays

15. Containment
 - o Primary Containment Structure and Internal Cell Structures
 - o Access hatches/locks/doors
 - o Penetration assemblies
 - o Reactor Cavity Vent System
 - o Reactor Containment Building Vacuum Relief System
 - o Confinement Filtration Systems
 16. Emergency Plant Service Water System (adequacy of water supply).
 17. Component Supports for Safety Class 1, 2 and 3 systems (see paragraph NF-1214, Section III, ASME Boiler & Pressure Vessel Code).
 18. Missile Barriers which protect safety-related structures, systems, and components.
 19. Biological Shielding
 20. Spent Fuel Pool and Liner
 21. Plant Safety-Parameter Display Console
 22. Equipment and other items associated with the emergency support facilities.
- b. Clarify table entries as noted below or justify not doing so.
1. Expand Table 3.2-1 to include an entry for containment internal structures which have been identified as a Seismic Category I structure in PSAR Section 3.8.3.
 2. Expand Table 3.2-1 to include an entry for cable trays which are identified as Seismic Category I structures in Table 3.8-2 of the PSAR.
 3. Since foundation support materials (rock, soils, backfill and concrete fill) are not specifically identified in the QA program for Seismic Category I structures, expand Table 3.2-1 to include an entry which reads "Foundations and Foundation Support Material (rocks, soils, backfill, and concrete fill) for Seismic Category I Structures."

4. Expand Table 3.2-1 to include an entry for "Emergency Plant Service Water System Supply and Return Headers in the Yard," which have been identified as Seismic Category I structures in PSAR Section 3.8.5.
5. Expand Table 3.2.1 to include an entry for "SGB Maintenance Bay" which has been identified as a Seismic Category I structure in PSAR Section 3.8.4.
6. Expand Table 3.2-1 to include an entry for "Underground Class 1E Electrical Ducting and Category I Pipe" which are identified as such in PSAR Section 3.8.5.1.1.
7. All features of the plant building and site having to do with the drainage of intense local precipitation should be included in Table 3.2-1. This includes roof drains, underground drainage systems, paved ditches, culverts and site grading.
8. The Emergency Chilled Water System is designated as Quality Group C in Table 3.2.2. We require the system to be Quality Group B (Safety Class 2).

Response:

The following supplements and clarifications are being made to the PSAR to completely identify safety-related structures, systems, and components controlled by the CRBRP Quality Assurance Program.

a.1 Instrumentation and Controls

All safety-related instrumentation and control systems and equipment for CRBRP are classified 1E. Reference 13 to PSAR Section 1.6, WARD-D-0165, "Requirements for Environmental Qualification of Class 1E Equipment," provides the list of Class 1E equipment for CRBRP. PSAR Table 3.2-3 and 7.1-1 are more general in nature and were not intended to serve as the Project QA list. WARD-D-0165 is presently being updated to include equipment recently designated Class 1E and this upcoming revision will include all the Class 1E instrumentation and control equipment listed in the question with some minor exceptions. These exceptions are:

- o The Failed Fuel Monitoring System is not safety-related, Class 1E, or included in WARD-D-0165. Sections 7.5.2.3 and 7.5.2.5 of the Safety Evaluation Report (SER) support the non-safety-related classification.

- o CRBRP does not employ an accident monitoring system per se. Accident monitoring is accomplished through a defined set of instrumentation incorporated in other plant systems. All Category I accident monitoring instrumentation of Regulatory Guide 1.97, which is required to be classified 1E, is included in WARD-D-0165.
- o The Remote Shutdown System is not classified 1E in its entirety, however, the Class 1E portions are listed in WARD-D-0165. Section 7.4.2.7 of the SER supports the Remote Shutdown System safety classification.

Also, it should be noted that:

- o CRBRP has not designated a separate core criticality system; the function is performed by the Class 1E Flux Monitoring System included in WARD-D-0165.
- o The Annulus and Reactor Service Building Filtration I&C Systems are included under HVAC systems in WARD-D-0165.
- o PSAR Table 7.1-1 has been revised to refer to WARD-D-0165.

a.2 Reactor Service Building Filtration System

The Reactor Service Building (RSB) Filtration System, along with its safety and seismic classification, is listed in PSAR Table 9.6-5. This system is a part of the Nuclear Island HVAC Systems, which has been added to PSAR Table 3.2-2 and references back to PSAR Table 9.6-5.

a.3 Control Room Filtration System

The Control Room Filtration System, along with its safety and seismic classification, is listed in PSAR Table 9.6-1. This system is a part of the Nuclear Island HVAC systems which has been added to PSAR Table 3.2-2 and references are provided back to PSAR Table 9.6-1.

a.4 Radioactivity Monitoring (Fixed and Portable)

Fixed radiation monitors which are safety-related are identified in PSAR Table 11.4-1. PSAR Table 7.1-1 has been revised to refer to Table 11.4-1 for this equipment. Portable radiation monitors will not be safety-related and are not specifically addressed in the PSAR, however they will be addressed at the Operating License stage.

a.5 Radioactivity Sampling (Air, Surfaces, Liquids)

Fixed process and effluent samplers which are safety-related are identified in PSAR Table 11.4-1. PSAR Table 7.1-1 has been revised to refer to Table 11.4-1 for this equipment.

a.6 Radioactive Contamination Measurement and Analysis

See item a.11

a.7 Personnel Monitoring Internal (e.g., whole body counter) and External (e.g. TLD system)

See item a.11

a.8 Instrument Storage, Calibration and Maintenance

See item a.11

a.9 Decontamination (Facilities, Personnel and Equipment)

See item a.11

a.10 Respiratory Protection, Including Testing Contamination Control Equipment

See item a.11

a.11 Contamination Control

Equipment and provisions for the above monitoring and functions are not considered safety-related and are not included in the tables of PSAR Sections 3.2 and 7.1. This equipment and provisions will be addressed in greater detail at the Operating License stage.

a.12 Radiation Shielding

Safety-related radiation shielding are integral parts of Seismic Category I structures as noted in revised PSAR Table 3.2-1.

a.13 Standby AC Auxiliary Power Systems (Class 1E)

The diesel generator auxiliary mechanical systems (lube, jacket cooling, air start) are identified in PSAR Table 3.2-2. The diesel generator auxiliary Class 1E electrical systems are

included in WARD-D-0165. Class 1E cables for the power system and for individual systems are identified in PSAR Table 3.2-3. Raceways, e.g. conduit and cable trays, for safety-related systems are seismic category I and Class 1E as indicated in revised PSAR Table 3.2-3. Component supports for Class 1E equipment are seismic Category I as indicated in modified PSAR Table 3.2-3. Safety-related electric valve operators, protective relays, and control panels, electrical penetrations for containment, and AC vital bus distribution equipment are all identified in WARD-D-0165. The battery packs of the Emergency Lighting System are not classified 1E and are not included in the table of 1E equipment. Section 9.12 of the SER supports the classification of the Emergency Lighting System.

a.14 DC Power Systems (Class 1E)

Cables, conduit, and cable trays for the DC Power System are identified in revised PSAR Table 3.2-3. Component supports (including battery racks for Class 1E DC equipment) are seismic Category I as indicated in revised PSAR Table 3.2-3. Class 1E DC Switchgear, distribution panels and protective relays are listed in WARD-D-0165.

a.15 Containment

The containment vessel, internal cell structures, access hatches/doors, and mechanical penetrations are integral parts of the Reactor Containment Building as indicated in modified PSAR Table 3.2-1. The Reactor Cavity Vent System is provided to mitigate accidents which are beyond the design base and is listed along with other such features in figure 1-1 of Reference 10b of PSAR Section 1.6. The Reactor Containment Building Vacuum Relief System is discussed in PSAR Section 6.2. The safety-related Reactor Containment Vacuum Breaker Valves are included as Isolation Valves in PSAR Table 3.2-2. The Containment Annulus Filtration System (there is no Confinement Filtration System) is listed in Table 3.2-2.

a.16 Emergency Plant Service Water System (adequacy of water supply)

The source of water for the Emergency Service Water System is the Emergency Cooling Tower Basin as discussed in PSAR Section 9.9.2. The Emergency Cooling Tower Basin is listed in Table 3.2-1.

a.17 Component Supports for Safety Class 1, 2, and 3 Systems

Component Supports for Safety Class 1, 2, and 3 components meet the ASME Code Section III, subsection NF requirements as discussed in PSAR Sections 3.9.1.6 and 3.9.2.6. Table 3.2-5 has been modified to so indicate.

a.18 Missile Barriers Which Protect Safety-Related Structures, Systems, and Components

Protective enclosures and barriers to missiles are identified in PSAR Table 3.5-1 and are integral parts of the Seismic Category I structures of PSAR Table 3.2-1.

a.19 Biological Shielding

Safety-related radiation and biological shielding are integral parts of Seismic Category I buildings and are indicated in revised PSAR Table 3.2-1.

a.20 Spent Fuel Pool and Limer

The Ex-Vessel Storage Tank (EVST) which stores spent CRBRP fuel is included in PSAR Table 3.2-2.

a.21 Plant Safety Parameter Display Console

See item a.22

a.22 Equipment and Other Items Associated with the Emergency Support Facilities

The Plant Safety Parameter Display Console and other equipment associated with the emergency support facilities are not safety-related and are not included in the tables of Seismic Category I or Class 1E equipment. This equipment conforms with the requirements of 10 CFR 50, Appendix E and the guidance of NUREG-0696 as confirmed in Section 13.3.2.6 of the SER.

- b.1 PSAR Table 3.2-1 has been modified to indicate that internal structures of Seismic Category I structures are included as integral parts of the Seismic Category I structure.

- b.2 Seismic Category I cable trays have been added to PSAR Table 3.2-3, "Preliminary list of System Components Classified 1E" as a footnote. The seismic design of such equipment is discussed in PSAR Section 3.10.
- b.3 Foundation support materials were not included in PSAR Table 3.2-1, "Seismic Category I Structures", however the requirements and a description of the inspection verification program during excavation and during fill and backfill are included in PSAR Sections 2.5.4.5.1.3 and 2.5.4.5.1.5 and figure 2.5-39.
- b.4 PSAR Table 3.2-2 has been modified to include the Emergency Plant Service Water System Pipes located in the yard.
- b.5 The SGB Maintenance Bay is a Seismic Category I structure included within the Steam Generator Building as it is defined in PSAR Section 3.8.4.1.3. PSAR Table 3.2-1 lists the Steam Generator Building which by definition includes all the bays, including the Maintenance Bay.
- b.6 PSAR Table 3.2-1 has been modified to include Class 1E Electrical Duct Banks and Table 3.2-2 has been modified to include all Seismic Category I buried pipe.
- b.7 Features of the plant buildings and site having to do with drainage of intense local precipitation are not Seismic Category I and have not been included in Table 3.2-1. Justification of the classification of these features is found in PSAR Section 2.4.2.3. SER Section 2.4.3.2 supports this position.
- b.8 The Emergency Chilled Water System is designed as Quality Group C, except for the containment isolation valves and interconnecting piping which are Quality Group B. Section 9.7.2 of the SER supports the conclusion that the requirements of Regulatory Guide 1.26 have been satisfied. PSAR Table 3.2-2 is correct as written.

TABLE 3.2-1

SEISMIC CATEGORY I STRUCTURES

		1.	Containment Building ⁽¹⁾
61	18	2.	Confinement Structure ⁽¹⁾
61		3.	Reactor Service Area of the Reactor Service Building ⁽¹⁾
		4.	Control Building ⁽¹⁾
		5.	Steam Generator Building ⁽¹⁾
		5a.	Electrical Equipment Building ⁽¹⁾
		6.	Diesel-Generator Building ⁽¹⁾
43	33	7.	Emergency Cooling Tower Basin
		8.	Diesel Fuel Storage Tank Foundation
	33	9.	Electric Manholes
43	32	10.	Class 1E Electrical Duct Banks (Buried)

(1) Includes Seismic Category I internal structures, safety-related radiation shielding, access hatches, and mechanical penetrations which are integral parts of the building.

TABLE 3.2-2 (Continued)

PRELIMINARY LIST OF SEISMIC CATEGORY I MECHANICAL SYSTEM
COMPONENTS AND ASSIGNED SAFETY CLASSES⁽³⁾

Components	Safety Class ⁽¹⁾	Quality Group ⁽¹¹⁾	Location ⁽²⁾	
Inert Gas Receiving and Processing System				
Primary Cover Gas Lines (Recycle Argon)	2	B	RCB	
Equalization Line Between Reactor Vessel Primary Pump and Overflow Vessel	2	B	RCB	
RAPS (Outside Containment)	3	C	RSB	36
RAPS (Inside Containment)	3	C	RCB	
CAPS (Outside Containment)	3	C	RSB	
Nuclear Island HVAC	see note 10] P
Emergency Plant Service Water System (5)	3	C	SGB, DGB, Emergency Cooling Tower, yard (buried)	
Emergency Chilled Water System (5)	3	C	SGB, CB, DGB, RSB, RCB	20
Auxiliary Mechanical Systems for Diesel Generators	3	C	DGB	
Fuel Oil Storage and Transfer System Including:				
Diesel Fuel Oil Storage Tanks	3	C	DGB	see Note 13 yard
Fuel Oil Transfer Pumps	3	C	DGB	
Fuel Oil Day Tanks	3	C	DGB	
Cooling Water System Including:				
Water Expansion Tank	3	C	DGB	
Jackets Cooling Heat Exchanger	3	C	DGB	
Water Temperature Regulating Valve	3	C	DGB	
Starting Air System Including:				
Air Storage Tanks	3	C	DGB	
Lubrication System Including:				
Lubricating Oil Heat Exchanger	3	C	DGB	
Lube Oil Filters and Strainers	3	C	DGB	

TABLE 3.2-2 (Continued)

PRELIMINARY LIST OF SEISMIC CATEGORY I MECHANICAL SYSTEM
COMPONENTS AND ASSIGNED SAFETY CLASSES⁽³⁾

Components	Safety Class ⁽¹⁾	Quality Group ⁽¹¹⁾	Location ⁽²⁾
Recirculating Gas Cooling System (Subsystems Serving: Na makeup pump cold trap pipeways, Na makeup pump and vessels, EVS pump and cold trap, EVS pumps and pipeways)	3	C	RSB, ROB
Non-Sodium Fire Protection System Piping and Valves Connecting to the Emergency Plant Service Water System	3	C	DGB

Notes:

- (1) Safety Classes are defined in Sections 3.2.2.1 through 3.2.2.3
- (2) ROB - Reactor Containment Building
IB - Intermediate Bay of the SGB
SGB - Steam Generator Building
RSB - Reactor Service Building
CB - Control Building
DGB - Diesel Generator Building
- (3) All components will be seismically qualified by analysis unless otherwise noted; motors are included with the mechanical components they drive.
- (4) The SWRPRS rupture disc assemblies will be seismically qualified by analysis based on rupture data obtained during dynamic testing.
- (5) Control panel attached to chillers will be qualified by test.
- (6) Out to Second Isolation Valve
- (7) Within Dual Isolation Valves
- (8) Downstream of Isolation Valve
- (9) Downstream of Second Isolation Valve
- (10) Identification of safety-related ventilation equipment is provided in Tables 9.6-1, 9.6-4, 9.6-5, 9.6-6 and 9.6-8.
- (11) Based on Regulatory Guide 1.26, as interpreted for an LMFBR
- (12) The containment annulus cooling system and containment cleanup system shall meet the safety class 3 requirements. However, these systems are provided for the mitigation of an accident beyond the design basis. Therefore, they are not classified as SC-3, but will be built to ASME III/3.
- (13) Quality assurance is in accordance with Reg Guide 1.137

TABLE 3.2-3

* PRELIMINARY LIST OF SYSTEM COMPONENTS CLASSIFIED 1E

Building Electric Power System

Motor Control Centers

Unit Substations

125V DC Distribution Panel

Battery Charges

Inverters

Vital Reg. Transformers

Batteries

4.16 KV Switchgear

Diesel Generator Sets

Diesel Generator XFMR and Resistors

Fuel Oil Transfer Pumps

Na Pump Drive Breaker Trips

Connectors and Terminations

Cables, Cable Trays, and Conduit

JP

Emergency Chilled Water System

Isolation Valve Operators

Pressure Control Valve Operators

Pressure Relief Valves

Emergency Chilled Water Pump

Control and Instrumentation

Cables, Cable Trays, and Conduit

JP

61 *The equipment contained in this list are generically identified. The specific, detailed listing of all Class 1E equipment, along with the environmental qualification program to which they are subjected, is provided in Reference 13 of PSAR Section 1.6. Class 1E systems, raceways, battery racks, and their supports are seismic category I.

TABLE 3.2-3 (Continued)

Heating, Ventilating, and Air Conditioning System

Unit Coolers

Emergency Chillers

Supply Fans

Exhaust Fans

Air Handling Units

Control Room Filter Fans

Control Room Filter Units

Control Room HVAC Monitors

Control Room Air Conditioning Units

Aux. Building HX Air Conditioning Units

Control and Instrumentation

Cables, *Cable Tray, and Conduit*

JP

Reactor Containment System

RCB TMBDB Instrumentation Panels

Containment Instrumentation Panels

Cables, *Cable Trays, and Conduit*

JP

Recirculating Gas Cooling System

Local Control Panels

Solenoid Valves

Moisture Switches

Liquid Level Switches

Cold Trap Flow Switches

TABLE 3.2-3 (Continued)

Cold Trap Temperature Switches	
Pump Temp. Switch	
Fan Motor	
Cables, <i>Cable Trays, and Conduit</i>	JP
Nuclear Island General Purpose Maintenance Equipment System	
Containment Isolation Valve Operators	
Cables, <i>Cable Trays, and Conduit</i>	JP
Steam Generator Auxiliary Heat Removal System	
Auxiliary Feedwater Pump Motors	
Auxiliary Feedwater Flow Meter	
Protected Air Cooled Condenser Condensate Flow Meter	
Auxiliary Feedwater Valve Operators	
Vent Control Valve Operators	
Water Storage Tank Fill Valve Operator	
AFW Turbine Steam Supply Valve Operator	
AFW Turbine Pressure Control Valve Operator	
Cables, <i>Cable trays, and Conduit</i>	JP
Steam Generator System	
Feedwater Valve Operators	
Superheater Outlet Valve Operators	
Steam Drum Drain Valve Operators	
Cables, <i>Cable Trays, and Conduit</i>	JP
Sodium-Water Reaction Pressure Relief System Instrumentation and Controls	

TABLE 3.2-3 (Continued)

Reactor Heat Transport Instrumentation System

Reactor Inlet Pressure Transmitter

Reactor Vessel Na Level Transmitter

Na Flow Sensor

PRI IHX Outlet Na Temp Sensor

Signal Conditioning

PHTS Pony Motors

Primary Pump Tachometer

Instrument Racks

Instrumentation

Reaction Products Dump Line Pressure Switches

IHTS FM Flow Sensor

Superheater and Steam Drum Vent Control Valve Operator

Temperature/Leak Detection Instrumentation

Steam Flow Meter

Superheated Steam Temperature Sensor

Superheater Steam Pressure Sensor

Feedwater Flow Meter

Feedwater Flow Meter

Feedwater Temp. Sensor

Evap. Outlet Sodium Temp. Sensors

Cables, cable Trays, and Conduit

61

JP

TABLE 3.2-3 (Continued)

Emergency Plant Service Water System

Pump Motors

ECT Fans

Makeup Pump Motors

Temp. Control Valve Operators

Temp. Transmitters

Temp. Indicator Controllers

Pressure Differential Switches

Level Switches

Cables, Cable Trays, and Conduit

Auxiliary Liquid Metal System

Valve Operators

Overflow Thermocouples

Local Panels

Pump Motors

Control Cabinets

Capacitor Cabinets

Transformer Cabinets

EVST Thermocouples

Control Room Panels

Cables, Cable Trays, and Conduit

EVST Cell Temperature Thermocouples

TABLE 3.2-3 (Continued)

Inert Gas Receiving and Processing Systems

Containment Isolation Valve Operators

Expansion Tank Equalization Valve Operator

Cables, *Cable Trays, and Conduit*

]P

Plant Control System

Main Control Panel

SCRAM Breaker Cubicle

Cables, *Cable Trays, and Conduit*

]P

Reactor and Vessel Instrumentation System

Reactor Coolant Operating Level Instrumentation

Cables, *Cable Trays, and Conduit*

]P

Flux Monitoring System

Flux Monitoring Instrumentation

Cabinets

Instrument Drawers

Cables, *Cable Trays and Conduit*

]P

Plant Protection System

Containment Isolation System Cabinets

Reactor Shutdown System Cabinets

Plant Protection System Cabinets

Cables, *Cable Trays, and Conduit*

]P

TABLE 3.2-5

PRELIMINARY LIST OF ASME CONSTRUCTION CODES, CODE CLASSIFICATIONS,
AND CODE CASE FOR SEISMIC CATEGORY I MECHANICAL SYSTEM COMPONENTS*

Component	Code/Code Class Edition/Addenda	Code Case Revision
Reactor Vessel & Primary Heat Transport System		
Reactor Vessel (1)	ASME-III/1 1974/Winter '74	1521-1, 1592-1, 1593-0, 1594-1, 1595-1, 1596-1, 1682, 1690
Closure Head (1)	ASME-III/1 1974/Winter '74	1521-1, 1592-4, 1593-1, 1682, 1690
Primary Sodium Pump Casing (1)	ASME III/1 1974/Winter '74	1521-1, 1592-1, 1593, 1594, 1595-1, 1596-1, 1682
Intermediate Heat Exchangers, IHX (Tubes and Shell)	ASME III/1 1974/Summer '74	1521-1, 1592-1, 1593, 1594-1, 1595, 1596-1
Primary Piping	ASME III/1 1974/Summer '75	1592-7, 1593-1, 1594-1, 1595-1, 1596-1, 1644-4
Reactor Guard Vessel (1)	ASME III/2 (2) 1974/Summer '75	1521-1, 1592-4, 1593-1, 1594-1, 1682-1
Pump and IHX Guard Vessels	ASME III/2 1974/Summer '74	1592-4, 1593-1, 1594-1
Upper Reactor Vessel Internals	ASME III/1 1977/Summer '77	1592-12, 1593-1, 1594-1
o Class 1 Appurtenances	ASME III/1 1974/Winter '74	
Lower Reactor Vessel Internals	ASME III/1	
o Horizontal Baffle Assembly	1974/Winter '76	1592-11
o Bypass Flow Module	1974/Winter '76	1592-11
o Lower Inlet Module	1974/Winter '76	1592-10
o Fixed Radial Shield	1977/Winter '77	N-47-16

*Applicable to Safety Class 1, 2 or 3 components.

Component supports for Safety Class 1, 2, or 3 components meet ASME,
Section III, Subsection NF requirements as discussed in PSAR
Sections 3.9.1.6 and 3.9.2.6.

TABLE 7.1-1

SAFETY-RELATED INSTRUMENTATION AND CONTROL SYSTEMS*

Reactor Shutdown Systems

Includes all RSS sensors, signal conditioning calculation units, comparators, buffers, 2/3 logic, scram actuators, scram breakers, control rods, back contacts on scram breakers, HTS shutdown logic, coolant pump breakers, and mechanical mounting hardware (equipment racks).

Containment Isolation System

Includes radiation monitoring sensors, signal conditioning, comparators, 2/3 logic, containment isolation valve actuators and valves.

Decay Heat Removal System Instrumentation and Control System

Includes Initiating sensors, signal conditioning, calculation units, comparators, logic, auxiliary feedwater pump actuators and controls including feedwater turbine pump, PACC DHX actuators and controls, steam relief valve actuators and valves; sensors, signal conditioning, logic and actuators related to decay heat removal functions of DHRS including control of sodium and NaK pumps and air blast heat exchangers; and sensors, signal conditioning, logic and actuators related to removal of heat from the EVST.

Sodium-Water Reaction Pressure Relief System (SWRPRS)

The Instrumentation, initiation and control logic which achieves adequate isolation and blow-down of the waterside of a superheater or evaporator in the event of a sodium/water reaction is Class 1E. The instrumentation used to initiate the isolation and blow-down valves are the rupture disc pressure detectors located downstream of the rupture discs. The other pressure and temperature instrumentation distributed throughout the sodium/water reaction pressure relief subsystem is used for status indication and is not Class 1E.

*The Clinch River Breeder Reactor Plant (CRBRP) safety-related structures, systems, and components are designed to remain functional in the event of a Safe Shutdown Earthquake (SSE). These include, but are not limited to, those structures, systems and components which are necessary:

- a. To assure the integrity of the Reactor Coolant Boundary;
- b. To shutdown the reactor and maintain it in a safe shutdown condition;
- c. To prevent or mitigate the consequences of accidents which could result in potential off-site exposures comparable to the guideline exposures of 10CFR100.

NOTE: Class 1E equipment loads are identified in Chapter 8.

{ A detailed listing of all Class 1E Instrumentation and Control equipment is provided in Reference 13, of PSAR Section 1.6.

Other Safety-Related Instrumentation and Control

Includes Instrumentation and Controls for portions of the following functions to assure the plant is maintained in a safe shutdown conditions:

- o Emergency Chilled Water System
- o Emergency Plant Service Water System
- o Instrumentation necessary to assure plant is maintained in safe shutdown status (See Table 7.5-4)
- o Heating, Ventilating, and Air Conditioning System
- o Recirculating Gas Cooling System
- o Process and Effluent Radiation Monitors and Samplers (See Table 11.4-1)